Renewable Energy and Sustainability at Rutgers

Informing the Rutgers Community about its energy conservation efforts through a freshman seminar

Tag Words: solar farm; sustainability; Rutgers; solar energy; sustainable energy power

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Summary

Rutgers has been considered well ahead of the curve in relation to its energy conservation and sustainability efforts as compared to other universities around the nation. The problem is that not enough of Rutgers students are conscious of the great strides that its school is making in these areas. Whether it is the 1.4 megawatt solar farm on Livingston campus, the projected geothermal building projects, or the $5 million lighting retrofit project, within the past few years, Rutgers has put in an immense amount of time and money to get us ahead of this curve. We have made it our goal as a group to reach out to Rutgers students and expose them to the universities goals to make Rutgers one of the leading sustainable campuses in the nation. After consulting with Rutgers Energy Conservation Manager/Sustainability Coordinator, Michael Kornitas, and the Associate Director of Environmental Service, David DeHart, we decided to focus our service project on developing a FIGS Seminar dedicated to teaching freshman students about renewable energy and sustainability. The 10 week course will explore sustainability issues (in energy, food, water, etc.) as well as give students the opportunity to see some Rutgers projects first hand through on-site field trips around campus.

Video Link

http://www.youtube.com/watch?v=n_RsoIdr-M

Issue

University has an enrollment of about 56,000 students on five different campuses. Of these 56,000 students, less than half are probably aware of the big things happening at the University. In 2007, construction began to create a sustainable campus on Livingston that incorporates solar

energy fields and geothermal energy systems. The problem with all of this is that there are few people who actually know this exists, and even those who are aware might not be familiar with the details of the project. Sustainability has become a popular topic in the last few years, and it is important that students as well as faculty and staff have the knowledge about how Rutgers is paving the way for energy conservation and sustainability among universities nationwide.

Energy: Intro and History

(BL) Energy is an important part of our daily lives. It heats our homes in the winter and cools them in the summer. It allows us to get from here to there, whether it is by car, train, plane, bus, or boat. It washes our clothes and keeps the street lights on so we can stay out late. Energy allows for all of these things, yet many people do not realize where our energy comes from and how much we actually use.

Thousands of years ago energy was simple. People made their own energy by burning wood to cook their food and heat their homes. Sails on boats used the wind to move along the waters. Today, energy is used in practically everything, and we are using more of it than ever before. With the use of more and more energy comes an almost terrifying problem- we are running out of it. The majority of our energy comes from nonrenewable sources that cannot be replenished in a short period of time. These forms of energy include coal, natural gas and petroleum. According to the Energy Information Administration (EIA), 37% of our energy consumption comes from petroleum which is used in transportation and manufacturing. Coal makes up 22.6% of our total energy consumption which is primarily used for electricity. About 23.5% comes from natural gas that allows for heating and electricity. All of these sources of energy could potentially run out some day, which means that we need to seek out new sources of energy that will last longer and that will have less adverse environmental and health impacts.

Coal

Coal's effects have a devastating impact on the human body, yet it is our most widely used form of electricity. When burned, it is responsible for respiratory effects such as asthma, chronic bronchitis and emphysema, as well as cardiovascular disease and cerebral vascular disease. Coal also contains trace amounts of mercury which collects in waterways, enters the food chain, and eventually is consumed by humans. There are a handful of environmental impacts of coal too. Mountaintop removal is an environmentally devastating process in which the tops of mountains are essentially blown off in order to mine coal. This leads to habitat destruction, air pollution and the contamination of waterways. Other adverse effects of coal mining include "the release of methane, a greenhouse gas causing climate change, interference with groundwater and water table levels, and acid mine drainage" which refers to the outflow of acidic water from coal mines. According to the Intergovernmental Panel on Climate Change, "methane has a global warming potential 21 times greater than that of carbon dioxide on a 100 year time line. While burning coal in power plants is most harmful to air quality, due to the emission of dangerous gases, the process of mining can release pockets of hazardous gases. These gases may pose a threat to coal miners as well as a source of air pollution."

http://205.254.135.24/totalenergy/data/annual/index.cfm
http://www1.american.edu/ted/projects/tedcross/xoilpr15.htm
http://en.wikipedia.org/wiki/Environmental_impact_of_coal_mining_and_burning

Natural Gas

(ML) The excavation of natural gas can cause much harm to the environment and can eventually leach pollutants onto human civilizations. Unlike coal, however, natural gas itself shows very few direct health effects to humans. Natural gas is non-toxic and odorless, and over 90% of it used in the United States is domestically produced. Natural gas deposits are found underground where they are locked into deep, dense rock. Only a powerful drilling process can release the gas, and it is in this technique that environmental pollution can occur. This hydraulic fracturing, known as "fracking", threatens rural landscapes, wildlife, and water supply. Methane, the primary hydrocarbon in natural gas is a flammable, ignitable, and irritating chemical. In some cases of fracking, methane can leach into local aquifers near the excavation site. Though the these incidences are uncommon, any case of pollutants entering drinking water must be recognized and properly alleviated while appropriate regulations are set in place. However, "fracking" is exempt from the Safe Drinking Water Act, and other loopholes have exempted it from parts of the Clean Water Act, the Resource Conservation and Recovery Act, the National Environmental Policy Act, and other federal regulations.

Burne, Michael. 2011. "Rogue Energy." Sierra. Vol 96, Issue 2. Database: Academic Search Premier
http://www.peoplesgas.com/resources/gasfacts/

Renewable Energy Overview

(BL) It is clear that the United States, and even the rest of the world, needs to invest in energy sources that are renewable, clean, and safe. Our own planet provides the means for us to do this in a more responsible manner. "Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, or from heat generated deep within the earth." By using the sun, wind, water, and heat from the ground we can generate energy that can replace the sources that are currently being widely used. "Climate change concerns, coupled with high oil prices, peak oil, and increasing government support, are driving increasing renewable energy legislation, incentives and commercialization".

The current growth of renewables is increasing, but there is still a long way to go until coal and other sources become obsolete. From the end of 2004 through 2009, "worldwide renewable energy capacity grew at rates of 10–60 percent annually for many technologies. For wind power and many other renewable technologies, growth accelerated in 2009 relative to the previous four years. More wind power capacity was added during 2009 than any other renewable technology." According to a 2011 projection by the International Energy Agency, "solar power generators may produce most of the world's electricity within 50 years, dramatically reducing

the emissions of greenhouse gases that harm the environment." Not only will the use of renewable energy help the environment, but it will also help create millions of jobs worldwide. In a study by Navigant Consulting, it was found that "if utilities were required to produce 20% and 25% of their energy from wind, solar and other renewable sources, between 191,000 and 274,000 jobs would be created, according to the study. The study also found that the U.S. would lose renewable energy jobs in the years ahead if such a renewable-energy standard would not be implemented."

http://www.renewableenergyworld.com/rea/tech/home
http://en.wikipedia.org/wiki/Renewable_energy
http://www.reuters.com/article/2011/09/19/us-climate-rifkin-idUSTRE78I3PX20110919

Policies and Barriers:

(ML) Since the end of the 21st century, much work has been done to develop policies that would promote renewable energy usage and deter the usage of wasteful energy sources that can damage our environment. Such a task is quite difficult to accomplish given certain barriers to proposed policies, mostly those of high costs.

An example of a renewable energy promotion policy is a price-setting and quantity-forcing policy. This is aimed to mandate prices to be paid for renewable energy, or requires a fixed share of generation to be renewable. By mandating prices, companies using or thinking of using renewable energy resources will be able to compare such costs to those of using an alternate energy source. However, enact this type of policy can be a challenge because of high costs and perceived risks, as well as the likelihood of unfavorable pricing rules.

Another type of policy, one that has gained much support over the past decade is a cost reduction policy. The focus of these policies is to reduce the investment costs of implementing a renewable energy system by offering subsidies, rebates, tax relief, loans, and grants. It is obvious that this policy will yield high costs, but it is a great tactic to persuade institutions to incorporate renewable energy systems. Similar policies are being enforced to reduce emissions by offering corporations comparable monetary benefits to incorporate cleaner waste and by-product disposal methods

A price cannot be put on the well-being of our environment, but getting politicians to see through this same lens is a challenge in its own. Many argue that, when compared to other energy sources, renewable energy costs more. Because of this, many policies and cost-driven decisions are often avoided. As previously discussed, offering subsidies for using renewable energy resources is a way to alleviate this burden of high cost. Although, similar subsidies like tax incentives and loans for the production of fossil fuels are being promoted on a global scale by organizations like the World Bank and the International Energy Agency, who offer annual subsidies of $100-200 billion for these fossil fuels. This puts renewable energy at a huge

competitive disadvantage. The institutions who begin to accept renewable energy subsidies over those of non-renewable energy, will begin an influential development towards the usage of cleaner and more sustainable energy.

http://martinot.info/Beck_Martinot_AP.pdf

Geothermal Energy

(ML) Geothermal energy is derived from the natural heat within the Earth. This heat can be found in any layer of the Earth. When converting geothermal heat into electricity via a power plant, geothermal reservoirs must be found. These are "pockets" of heat within the Earth that are not found at a uniform depth. To find these reservoirs, geologists may study aerial photographs and geological maps, but the only certain way is to dig an exploratory well. However, in areas not near extremely hot geothermal reservoirs, ground-source heat pumps (GHPs) are used to produce energy for the heating and cooling of buildings and homes. Home pumps usually penetrate the Earth's crust to 20-50 feet, at which a constant temperature is held year round (somewhere between 50°F and 60°F). Both techniques capture a sufficient amount heat to produce energy, but the amount of energy produced is relative to the size and temperature of the heat source.

Ground-Source Heat Pumps:

GHPs use the Earth's constant temperature to cool and heat houses and buildings by circulating water through a series of pipes bored underground. John Kelly, the COO of the Geothermal Exchange Organization offers an example to further clarify this phenomenon; "Let's say in Kansas City, the underground temperature is 55 degrees. In summer, the air temperature is 100 degrees, and in winter it's 20, the underground temperature will stay a constant 55 degrees. It's not that hard to get that constant temperature out of the ground so you can heat in winter and cool in summer." Accordingly, a GHP will warm a house or building in the winter by transferring the heat from the ground to the house, and in the summer the process reverses to move the heat from the house down into the ground.

The pump uses a system of pipes, called loops, submersed beneath the ground that are filled with liquid - usually a mixture of water and antifreeze. This fluid will carry the heat from the Earth into the house. The mixture travels through an electrically driven compressor and heat exchanger to concentrate the thermal energy provided from the Earth to then release it into the house though a series of ducts. In the summer, the same loops will cool the house by drawing excess heat from inside the house down into the ground. A refrigerator works the same way as it expels unwanted heat rather than blowing cool air.

Installing this pump system is extremely technical and requires a great deal of professional expertise. The length of loop to be used, for example, is determined by many factors, including the heating and air-conditioning load of your home, local soil conditions and landscaping, and the severity of your climate. For these reasons, there are different configurations of loops.

A horizontal ground closed loop is installed three to six feet underground and is used when there is adequate yard space. They are laid horizontally parallel to one another and typically run 400 to 600 feet in length for each ton of heating and cooling. Although this system is considered the most cost effective, the most efficient loop system is a vertical ground closed loop. This is typically used in an area with a small amount of yard space, and is installed by boring a vertical hole 150 to 400 feet deep – much like wells. A single loop of pipe shaped like a "U" is set in place before the hole is back-filled. Vertical loops are considered more efficient than horizontal loops because more of the pipe is in contact with stable, cool earth materials. Because of their depth, they can also be drilled into groundwater rather than dry ground, which is advantageous because water is a very good conductor of heat.

http://www.consumerenergycenter.org/home/heating_cooling/geothermal.html
Seward, Aaron. 2011. "Going Underground". The AIA Journal. P. 50-54. Database: ProQuest
http://www.need.org/needpdf/infobook_activities/SecInfo/GeothermalS.pdf

Geothermal at Rutgers

Rutgers currently plans to incorporate multiple vertical loop ground source heat pumps to cool and heat the new Business School building that will be located on Livingston campus adjacent to Beck Hall. Construction has begun this semester and the geothermal system will include 320 wells, each 500 feet deep. As development on Livingston campus continues, geothermal ground pumps are expected to be installed in future buildings. This system will save Rutgers approximately $290,000 per year by reducing 0.6 million kilowatts of electricity and 46,000 tons of natural gas annually. The total cost of the system cannot be found at this time however, Congressman Frank Pallone, Jr. has requested $2.5 million dollars from Congress for this project.

Solar Energy

(NP) These days we are seeing more solar panels throughout the world, from the top of the world to the calculators we use daily. This prevalence is a good thing because solar panels produce zero emissions, has no mechanical parts, and is a renewable resource. The sun radiates enough energy in one second to power the world's energy needs for 500,000 years. However, our current technology can capture only a fraction of the light energy emitted by the sun. Solar panels are arrangements of multiple photovoltaic cells that capture the sun's energy. Each cell consists of a semiconductor, such as silicone that releases a negatively charged electron when a light photon is absorbed. Individual solar cells vary in size however, despite the size of the cell, they all produce one watt of electrical energy. This is why a single average home solar panel has about 150 individual cells which produce 150 watts of energy. A single solar cell does not produce enough electricity to run most of our electrical equipment we use every day. Most of our electrical appliances run anywhere from 18 watts (60 watts equivalent compact fluorescent bulb) to 4400 watts (average electric clothes dryer) therefore, with a single solar panel one may not be able meet their everyday energy demands. A user would have to connect many solar panels

together to be able to run most of their electrical equipment reducing their use of nonrenewable energy, carbon footprint and financial burden. Unlike gas generators solar panels do not have moving parts reducing the chance that something will break.

"NASA's Cosmicopia -- Ask Us -- Sun." ***NASA's Cosmicopia -- Home.*** **Web. 18 Oct. 2011. <http://helios.gsfc.nasa.gov/qa_sun.html>.**

Bluejay, Michael. "How Much Electricity Does My Stuff Use?" ***Michael Bluejay - Official Home Page.*** **Web. 18 Oct. 2011. <http://michaelbluejay.com/electricity/howmuch.html>.**

Despite the benefits of solar panels we cannot completely depend on them to run 100 percent of the time. The reason is that if there is no sunlight then there is no energy produced. What is one to do on a rainy or cloudy day? One solution many have applied is called the grid-tied system. This system uses solar panels and the house or facility is tied into the electrical grid. This system uses its own energy when light is available but uses energy from an energy company when the solar panels do not produce enough energy. Some benefits this system possesses are that batteries are not needed and any un-used electricity is sent back into the electrical grid. All the energy sent back to the electrical grid is credited to the owner for all the electricity generated on their electric bill. However this system, while convenient for the user, is still using energy obtained from a carbon or nuclear source at some point. Ideally we would like all of our energy to come from a renewable resource at all times.

Another system is called a standalone system which uses solar panels and batteries only. This system is usually for small homes or facilities that are in rural location and cannot obtain energy from a supplier. The unused energy during the day charges the batteries. The batteries energy is used later when the sun goes down. The system capacity is directly related to the amount of batteries the user has. But batteries have multiple limiting factors. One of the limiting factors is the storage capacity of a battery. A car battery, similar to what is used in a solar panel system, produces 500 watts for only three minutes. After three minutes the amount of watts is greatly reduced. Running a 500 watt refrigerator for three minutes will not be sufficient to cool food. You can use multiple batteries to extend the use of the refrigerator but the cost and size make it difficult for most to apply. Battery technology has not changed much over its history but recently a few companies have made a break through pertaining to battery capacity where a series of batteries are connected together to produce 1.2 megawatts of energy for seven hours. This battery array will provide energy to their small community in Texas to power the entire town during a blackout. This system is rather large and bulky and will not fit into a house. To get an idea what this battery bank looks like refer to the citation below about fixing the power grid.

Fairley, Peter. "Fixing the Power Grid - Technology Review." ***Technology Review: The Authority on the Future of Technology.*** **Web. 18 Oct. 2011. <http://www.technologyreview.com/energy/19584/>.**

Perry, Pam. "How Solar Panels Work." ***TrustyGuides.*** **Web. 18 Oct. 2011. <http://www.trustyguides.com/solar-panels1.html>.**

Rutgers Solar Energy Project

Currently, Rutgers has 7,000 solar panels that are on the Livingston Campus. These solar panels generate 1.4 megawatts which reduces Rutgers' electrical demand by ten percent at a savings of $300,000 per year. These panels also reduce Rutgers' carbon dioxide emissions by 1,200 tons per year. Recently, Rutgers has been approved to install solar panels above two parking lots in Livingston Campus which will consist of 40,000 solar panels. When completed in the summer of 2010, these panels will save Rutgers an additional 1.2 million dollars in energy costs and provide 60 percent of the energy needed for Livingston campus. The total cost of the solar energy project is $40.8 million. However, Rutgers will not have to spend a dime for upfront cost. This is due to a third-party project lesser which will pay all upfront cost and owns the solar canopy. The third party will also receive federal tax incentives which can be used as a tax break. Rutgers on the other hand is responsible for maintenance of the canopy and makes lease payments to the owners of the canopy but Rutgers will have all the rights to the energy created by the canopy. Rutgers also receives state credits through New Jersey's Solar Renewable Energy Credits (SRECs). The SRECs are credits that can be sold to an energy supplier to generate income for the university. With the energy generated and the SRECs Rutgers will net $28 million over 20 years. After the lease is over in 15 years Rutgers can purchase the canopy system at fair market value, which right now is estimated to be $3.6 million.

Service Project: Freshman Seminar

(BL, ML, NP) The goal of our service project is to bring awareness to the sustainability efforts that Rutgers has been implementing over the last few years. We spoke with Mike Kornitas who is the Energy Conservation Manager at Rutgers and is in charge of the projects going on. Originally we wanted to do a campus tour of Livingston for incoming students, but instead Mike told us that he was thinking of creating a seminar for first-year students highlighting sustainability. Our project will be designing a one-credit freshman seminar for incoming first-year students that will focus on sustainability and energy conservation. Reaching out to new students will be the most effective way of bringing light to the groundbreaking work that Rutgers is doing on Livingston Campus. Our main focus with the service project is to develop a syllabus and a curriculum for the seminar. It will be a FIGS course that Rutgers currently offers and will consist of ten 80-minute lectures worth one credit. Each lecture will be on a different topic related to sustainability that includes but is not limited to energy, food, recycling, forestry and farming, water, and a variety of educational field trips. The lectures will be taught by students who are familiar with the topic. We emailed Students for Environmental Awareness and proposed the idea of teaching this course. Below is the email sent to the President of SEA:

To: Ruchi Patel, President S.E.A.

From: Briana Lane

RE: FIGS course

My name is Briana Lane, and I would like to propose a project for Students for Environmental Awareness. For a final class project my group and I would like to put together a FIGS course that aims at educating freshman about sustainability as well as the efforts being taken by Rutgers to implement sustainable practices at the University. As you probably know, FIGS is a student-taught lecture once a week for 10 weeks. We would like to know if you and members of your organization would be interested in teaching this course. We have put together a tentative syllabus outlining the topics for each week. The reason that we are doing this is to show incoming students that Rutgers has been taking steps to make Rutgers more sustainable and green. On Livingston campus there is a 1.4 megawatt solar farm, and an 8 megawatt solar canopy project will begin construction soon. A geothermal system will be use to heat and cool new academic buildings on the campus. If you or anyone in S.E.A would be interested in participating, please let me know via email. We would love to work with you. Thank you.

Below is the 10-day course syllabus:

Course description:

Introduction to sustainability is a 10 week 1 credit course designed for incoming freshmen. Through lectures and field trips, the class will explore issues in sustainability such as energy, food, water, and others. This course will also inform students on how to live a more sustainable life.

Day 1

Introduction and field trip to solar farm

Introduce students to the definition of sustainability, which is using a resource in a way that will not deplete the resource. The instructor will talk about sustainable issues that will be covered later in the semester in order to relate these issues to the students. A trip to the solar farm should grab the interests of students and get them excited about the next lecture. During the field trip the instructor will give a brief introduction into energy conservation.

Day 2

Energy

On this day the instructor will talk about energy conservation. Start with reminding students where most of our energy comes from for example nuclear or coal burning plants. The instructor will give a hand out to students containing a list of house hold appliances and how much energy each uses in order to put a perspective on how much energy they consume. Next the instructor will talk about alternatives such as wind, solar, and geothermal.

Day 3

Food

Food conservation will be the topic of day 3. Remind students that food should be a small portion of garbage. The instructor will advise students on how to deal with their food waste such as composting. For the field trip on the next class tell the students about how a pig farmer comes to campus and picks up all the uneaten food. In return the farmer gets paid thousands of dollars a year and does not have to pay for his pigs' food.

Day 4

Field Trip dining kitchen

The field trip will be at one of the dining halls that participate in food conservation. Here the instructor will take the students behind the scenes and show the students how the food is compressed into blocks and the quantity of food the students waste. Again the field trip should shed light on the issue of food sustainability.

Day 5

Recycling

Introduce students about recycling and what materials can be recycled. Go into detail about what students are familiar with already in recycling such as paper, plastic, metal and glass. But also go into detail about new recyclable items such as cell phones, televisions, Styrofoam and computers. Watch a short video on how a recycling company deals with all the material.

Day 6

Sustainable forestry/farming

On this day the instructor will talk about sustainable farming and forestry. Remind students about how much paper they use in their lifetime from the previous lecture and where the paper comes from. The students should all know paper comes from trees but they should not know where the tree to make the papers comes from. Talk about the differences between plantation farming and old growth forest and how plantation farming uses fast growing trees in order to leave the small percent of old growth forest left in the world. Also tell them about the biodiversity issues between old growth and plantation farming. Plantation farming as low biological diversity compared to old growth forest. This lecture will lead into the field trip during the next class. Also talk about how paper is recycled and reused.

Day 7

Field trip to Johnson Park

On this day the instructor will take the students in to Johnson Park off of River Road. In the park there is a small patch of land where white pine trees were planted. This is the type of trees used in plantation farming. We can show the students the difference in bio-diversity and the sudden change

under their feet as they walk into the white pine forest. The white pine forest's floor is soft and spongy and contains little to no humus while the old growth forest has humus. The idea of the field trip is to make students realize that sometimes when trying to find a sustainable solution for humans we run into problems with other life forms.

Day 8

Water

Water will be the topic of this day. Remind the students how much water an average American uses in a day. Tell the students about how much consumable freshwater there is on the planet. Talk about how water is treated and where it goes after it goes down our drains. Also talk about how much water lawns and gardening uses. Then segue into how water is recycled and reused by gray water systems, rain catches, and other methods.

Day 9

Sustainability at home

Remind them that they can make a difference at home. Teach them about the differences between compact fluorescents and incandescent light bulbs and how compact fluorescent bulbs are better. Tell the students how water at their home can be saved by using a grey water system. Also teach the students about reusing their food scraps to make compost for their gardening.

Day 10

Rutgers sustainability

On the final day the instructor will teach the students all about Rutgers sustainability. Remind the students about the Rutgers solar project they saw the first day and how Rutgers in ahead of the curve when it comes to sustainability. Also remind the students about the geothermal system that is installed on Livingston campus. This day is to make students remember all the energy conservation efforts Rutgers has done to give them pride in their university.

Editorials

Briana Lane (sent to The Trentonian)

You Should Know: Rutgers Works to Create Sustainable Campus

There are roughly over 56,000 students that are enrolled at Rutgers University on the New Brunswick Campus. Of these approximately 56,000 students, less than half are probably aware of the big things happening at the University. In 2007, construction began to create a sustainable campus on Livingston that incorporates solar energy fields and geothermal energy systems, among many other projects. In 2009 a seven-acre solar energy facility that provides about 10 percent of the power needs of the Livingston Campus was completed. But Rutgers didn't stop

there. In the summer of 2012, construction will be completed on a 32-acre solar canopy energy system that will generate approximately $1.2 million in electricity. A geothermal energy system will also be constructed and completed in 2012 that will provide the heating and cooling to new buildings, including the new Business School. While all of this sounds pleasant, the problem is that there are few people who actually know this exists, and even those who *are* aware might not be familiar with the details of the project. Sustainability has grown to be a popular topic in the last few years, and it seems that everyone wants to get a hand in it. There should be some sort of way to communicate these sustainability efforts to the public and incoming students as well. It is important that students as well as faculty and staff have the knowledge about how Rutgers is paving the way for energy conservation and sustainability among universities nationwide.

Nilesh Patel (sent to The Star-Ledger)

The issue of energy has been a hot topic in recent years. With the world's population reaching almost seven billion people, the topic of energy will become more prevalent over the coming years. In order to keep up with the demand and keep our planet healthy we must find a clean energy solution to our energy problem. I am a student at Rutgers University and I was unaware of what was in the backyard of New Jersey until I came to Rutgers. Rutgers University is on the way to building the nation's largest solar panel farms of its kind. When the project is completed in the summer of 2012 there will be 40,000 solar panels over two parking lots on Livingston campus. This will generate 60 percent of the energy demand that is needed for Livingston campus at a savings of 1.2 million dollars annually. Now imagine if we can put solar panels over all the parking lots in New Jersey. How much money and energy can New Jersey as a whole save from this idea? Not only will the panels keep the sun, rain and snow off the cars but it will also generate clean sustainable energy for the surrounding business and homes. We must keep reminding people that there are sustainable ways of obtaining energy. In order to do so our project is to educate incoming Rutgers students about sustainability efforts at Rutgers through a freshmen seminar. Not only does Rutgers put effort in energy sustainability but they also are involved with food waste disposal and geothermal energy. I hope other colleges and communities take a look at what Rutgers has done and implement their ideas on their land in order to protect our planet for future generations.

According to Rutgers' Energy Conservation manager, Michael Kornitas, The NJ State University is "well ahead of the curve" in its energy conservation efforts around the New Brunswick Campus in relation to all other universities across the nation.

Michael Lane (sent to Greater Media Newsletters)

A landmark development that had operated as a driving mechanism for additional energy conservation projects was the production of the Livingston Solar Farm in 2009 located on Livingston Campus in Piscataway.

The 1.4 megawatt solar farm exceeded expectations by generating approximately 11 % of the campus's electrical demand surpassing the original projection of 10%. Additionally, it reduces the universities carbon dioxide emissions by more than 1,300 tons per year. The solar farm, one of the largest both in New Jersey and at a single campus in the nation is expected to save Rutgers over $200,000 a year.

Rutgers, partnering with PSE&G, has begun a $5 million lighting retrofit project. It is replacing existing lighting with high-efficiency lighting on every campus of the university. Approximately 80% of the cost is being covered by PSE&G with Rutgers covering 20%. The project is expected to save Rutgers 6,426,905 KW per year. That equates to a financial savings of $938,000 a year while also providing additional jobs to the community.

Such steps taken by a state school should not go unnoticed.