

UNIVERSITY OF MASSACHUSETTS AMHERST  
OFFICE OF THE FACULTY SENATE

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ADDRESS BY JOYCE HATCH, VICE CHANCELLOR FOR ADMINISTRATION AND  
FINANCE

A PDF version of the PowerPoint presentation is available at:  
[http://www.umass.edu/senate/fs/minutes/2008-2009/hatch\\_powerpoint\\_678\\_11-20-08.pdf](http://www.umass.edu/senate/fs/minutes/2008-2009/hatch_powerpoint_678_11-20-08.pdf)

*Joyce Hatch, Vice Chancellor for Administration and Finance*

I want to share some of the efforts that have been underway in the areas of energy conservation and sustainability. I have with me a few key players. Pat Daly is the director of the Physical Plant and Craig Ruberti is the Environmental Health and Safety Manager for the new central heating plant. He also heads the campus Environmental Performance Advisory Committee (EPAC).

Before he was director, Pat Daly headed the utilities area in the Physical Plant, and he and others had been talking about putting this together for a while. In 2002, we went out for a bid with ESCO, an energy services company. We put out the bid in conjunction with the State Department of Capital Asset Management. We partnered with DCAM, and they brought a lot of legal services and expertise with them. The successor company was Johnson Controls. When they answer the bid, they do an audit of the campus and then guarantee savings. If we do not make the savings, they pay us. We are saving over \$5 million a year which pays for the borrowed money. We borrowed \$47 million for ten years. We have enough savings to pay the debt, and in another 6-7 years, we will be able to use the \$5 million for our Capital Plan and reinvest in steam lines and buildings.

Another aspect of the project was to install meters in every building or joint groups of buildings on campus. We now meter steam, water and electricity. Since 2002, we have saved 24 percent of our steam usage and 47 percent of our water. With electricity, we expected a little bit more of a reduction, but we still have 9 percent. During this time, we constructed the new student apartments and included four new apartment buildings and 860 beds.

Due to EPA requirements and because we had to document the old and new heating plants, Craig Ruberti has been very involved in tracking our carbon footprint for many years. What we have seen as a result of the energy conservation project is a reduction of our CO<sub>2</sub>. From 2004, we have reduced our carbon footprint. This is before the heating plant is fully online, and we expect a further reduction this year because of the heating plant.

*Pat Daly, Director of the Physical Plant*

We signed the contract with Johnson Controls (JCI) in June 2004. When we signed on, we funded 53 energy conservation measures. The total value of the project at that time was \$42,700,000, and they guaranteed an average savings of \$6,268,000. Under the DCAM program, they had received special legislation to do this as a design-build project. One of the rules of the program was you had to have a simple payback of 7 years or less. We ended up at 6.8 years. It was a good project. It was the largest project that the Commonwealth had done to that point.

As far as project challenges, Johnson Controls signed on to do \$42.7 million of work, covering the whole 10 million square feet of our campus. They guaranteed to have it done in 12 months and begin saving us money on day one. The project actually took 36 months to complete. Although we had savings in the first year, we did not make the guaranteed savings in the first three years. In the fourth year, we started making the savings that they had guaranteed. We are in year five right now.

When we ended the first year and we knew we had not made the savings, JCI was reluctant to come through with paying the shortfall. We ran into some very difficult times. At that point, DCAM started helping us a lot. They came out with lawyers, directors and project managers. At one time, I was looking out of the Physical Plant office, and we had eight people from DCAM there full time to try to figure out what Johnson owed us. We wanted to know if we should send them off-campus, sue them or force them to finish the job. Johnson, to their credit, did stay with the project through some very difficult times and meetings. In the end, we ended up with a project that is complete. We have one job left to do. That job is to move the steam turbine from the old to the new power plant once that is ready.

I would like to mention some of the highlights of the project. They put in a new electric generator in our old power plant. That generator cost \$2.6 million. Moving it to the new power plant is included in that cost. It is saving us \$594,000. With the way energy prices went this year, that number is significantly higher now. That turned out to be a very good job.

We now have an effluent filter that takes the gray water that is coming out of the Amherst wastewater treatment plant. We have tied into their pipe that is piping that sewer effluent to the Connecticut River, and we run it through a filter system. We use it for make-up water in our boilers. We are starting to pipe it around campus to use it as make-up water in our cooling towers, and at some point we would like to use it for irrigation. We replaced 2,300 toilets, flushometers and faucets. We replaced 117,000 light bulbs and balasts. You can see that all of these projects have some significant paybacks. As Vice Chancellor Hatch was telling you, we have completely metered the campus. We now know what each building uses for steam, water and electricity. They had no guaranteed annual savings on that. However, as we start making people aware of what they are using in their buildings, particularly the revenue-based budgets, they are starting to put a lot of effort towards reducing their use.

We also did an infrared flyover. They flew a helicopter over the campus and took pictures of our campus to look for leaking steam lines. This is Curry Hicks cage (referring to slide). Here is the 2006 flyover. That white line in front is a leaking steam line. Insulation had broken down and we had steam coming out of the manholes. We funded that project as part of the JCI project. This is what it looked like in the 2007 flyover after we completed the job. You can see we went from white to red light. That is the amount of heat we are saving. We also contracted with an engineering firm to give us an analysis of the steam line and how much we will save based on the infrared picture. We can use this for the planning of future jobs. It gave us a good baseline on the condition of our steam lines.

Outside of the Johnson project, the Physical Plant is proud of our 15-year-old recycling program. In 2008, our recycling rate was about 56 percent of the waste we generated. We avoided \$288,000 in disposable fees at the Northampton landfill. I want to give you an idea of what 56 percent means in volume. In 2008, we recycled 9 of the 16 million pounds of waste we generated. One of the things we are trying to do is increase that level of recycling. The EPAC team is trying to do a lot of marketing and some grassroots support for increasing the recycling rate on campus, and we think we can get that number even higher. A lot of the effort on the student side will be to try and help us get our recycling rates higher.

#### Vice Chancellor Hatch

I just want to point out a few more efforts on campus. Dining Services just won an award for being a local hero. The Commissioner of Agriculture presented the award to Ken Toong, Director of Dining Services. Right now, they purchase 20 percent of their produce locally which is amazing when you realize that the growing season does not exactly match our academic season. The goal is to get to 25 percent, and Mr. Toong thinks, given the produce and when we can get the access locally, that is probably the maximum we can do. This also affects the quality of food as well.

We are doing a lot of construction. The new buildings are not completely LEED-certified. They come close, and there are some really interesting features in some of them. The ISB, opening next spring,

has a heat wheel which recovers heat during warmer times and stores and releases heat when it is needed. There are a number of other features: recycling water off the roof, going into the cooling system and pipes underground. We are using renewable wood in the cabinets, and there are renewable materials in the art building, too. In the future, the goal, if it is affordable, is to meet silver LEED-certification. The Police Station, in current design, will certainly meet that goal.

Director Daly, in his area, uses all green cleaning products. Auxiliary Services and Dining have a different OS1 cleaning program. We also have a chemical inventory system. While it is not geared to save energy, in a way it is sustainable. Donald Robinson, Director of EH&S, pushed to have this implemented and it took a number of years. We have been able to reduce our chemical storage and have a great database so people share when possible to keep down the additional chemicals coming to campus. It has reduced our chemical load overall, and we know where every chemical is on campus.

A certain number of our operations on campus are self-sustaining. Over the years, Housing, Dining and Auxiliary Services have paid for utilities. But it has been on a square foot basis. They did not really feel in control. After the advent of metering, the Budget Office created a model. Knowing their usage from the year before, if Housing, Dining or Auxiliary Services reduces their usage, they will get a rebate back at the end of the year. They will share in the financial savings that the campus realizes.

#### Director Daly

After Auxiliary Services started working on this, they cut their overall budget to date. They have reduced their utility budget which is based on last year's historical data by 10 percent, and they have not invested in capital yet. They have done it by turning off water, turning off lights and being attentive to what is going on in their buildings and seeing ways to save. They have done a very good job in proving that there are still ways to save energy on this campus without investing a lot of money.

What are we thinking about doing next? We have another steam turbine that we can put into the power plant that will pay for itself in two years in terms of generated electricity at current rates. We are looking into working with Curt Conner in chemical engineering. We are looking into a biodiesel unit. The Johnson Controls contract also brought in \$2 million of rebates from the utilities. The rebate money that came in paid for all of the hazardous waste removal. They brought an \$80,000 grant from the Mass Technology Corporation to install photovoltaic cells on the roof of the Knowles Building. So, the University is generating five kilowatts of electricity from the sun and received a \$50,000 grant to study the feasibility of putting a biomass boiler into its new central heating plant. There is an open bay in that heating plant, and the study came in from the MTC. It does say that it is feasible, that if we put a biomass boiler in at current energy rates and for the cost of shredded wood, we could pay for that project in less than five years. We are looking into bringing this project through design so that we can apply for more grants and see if we can put that project in. Several state agencies have been lobbying with us to put a wood boiler in to take advantage of all the state forests, and so we are going to see if they want to come up with some money to help us do that.

#### Craig Ruberti, Environmental Health and Safety Manager

As Director Daly and Vice Chancellor Hatch have indicated, the campus has done a number of items to improve environmental performance as well as increase efficiencies across campus operations. The Environmental Performance Advisory Committee was created in early 2008 under then Interim Chancellor Cole. I think it was a recognition that there are additional opportunities that the campus can take to further improve environmental performance. There were essentially five items in the charge bestowed upon the Committee. One was to assess additional ways in which the campus can improve environmental performance in a cost-effective fashion. Second was to improve the way we track and capture environmental performance-related data on campus to better analyze our operations and performance. The third, which is a hot topic today, was to develop a 10-year climate action plan for the campus. How can we additionally reduce our carbon footprint? The fourth was to devise a comprehensive and commonsense way in which we can enhance environmental stewardship

across campus operations among faculty, staff and students. The last one is to advise the Chancellor's Executive Board on all matters related to environmental performance and sustainability. There have been three things that we have tried to tackle since the Committee's inception. I'll speak briefly about the policy development which we had started discussions on in the summertime, and that is a green building committee. As you know, we are experiencing a significant growth in construction on campus. We are looking at how to systematically incorporate Green Building Design into new construction as well as buildings that may be renovated in the future.

Director Daly talked a little about the metering of the Auxiliary Services and Housing buildings. There are financial incentives for them to improve their utilities and environmental performance. They are seeing these cost savings through the measures that they incorporate within their respective buildings. We are trying to develop a model that can be applied to the academic side of the house as well. We are coming up with a financial model or framework that would allow the colleges that participate to receive some sort of financial incentive for incorporating energy efficiency measures within their respective buildings. That is being done through NRE as well as the College of Engineering.

The last thing you may want to take a look at is our webpage which I reference here. I think most of you probably have not heard about EPAC, but you will be hearing more about us in the future. You can go to our web site for campus related environmental information through [umass.edu/epac](http://umass.edu/epac).

I want to talk a little about our Environmental Awareness and Energy Conservation Campaign. Due to the timing, we decided to focus on first-year students through what we call our Eco-Rep program. There are eight dorms included in this initiative and it affects about 2,000 students. I have three students who are helping me with this initiative: Josh Stoffel, Wendy Ratner and Susanne Hale. We have recruited students to participate in this initiative, and we have about 53 students that act as Eco-Reps. They are the environmental liaisons on each floor of the first-year dorms. We have monthly topics that they go out and interact with their peers on: water and energy conservation, solid waste recycling. We recognize that there are two components to any campaign. One is the information element. The other is an interactive component. We have developed promotion materials, table tents and posters. We have put them up in the dining commons and let students know about this initiative and where they can go for additional information on how to improve their environmental footprint. One aspect of this is we have opened up a logo contest to the student body, and we are accepting submissions. Hopefully, at the end of this month, we will have identified a logo that we can use for this campaign to help us brand this effort.

Now that we have the student element under our belts, we are looking to roll this out to both faculty and staff, so we are in the midst of discussions on how we want to do this and how we want to develop the interactive component with both those elements of the campus operations.

As I mentioned, we have tried to direct students back to our web site for the simple solutions and steps that they can take to improve their environmental performance. These are commonsense, no-brainer types of activities that they can do on a day-to-day basis to decrease energy and water consumption as well as improve solid waste recycling rates. We have tailored this web site to staff, faculty and students. So, the information up there is catered to each of those segments of campus. We have a little handout that was disseminated. As you leave here today, you can think about these five action items. They are: lighting. This is commonsense. You can turn off the lights after you leave your lecture hall. Turn off the lights as you leave your office. If you haven't already, you can enable your energy management function on your computer, whether it be your desktop or laptop. There are directions on our web site on how to do that. If you are in the lab and conducting research, ensure that your fume hoods are shut when not in use. These are energy hogs and can contribute to a significant amount of energy and cost savings across the board should they be managed and operated properly. These are very commonsense activities and operations, and on an individual basis, they may not seem like a lot, but when you look at the fact that we have 28,000 students across the board on this campus, those actions add up.