



**Tufts**  
UNIVERSITY

Cummings School of  
Veterinary Medicine

## **CUMMINGS SCHOOL SOLAR PROJECT**

### **Frequently Asked Questions from the School Community**

**September 25, 2012**

- 1. How will the Cummings School preserve and maintain land for its agricultural veterinary education mission - providing pasture for food production animals and fields for growing feed for these animals-if acreage is taken away from the farm for these solar installations?**

The Cummings School's campus has 594 acres in Grafton and Westborough. The school has voluntarily avoided development on almost two hundred acres of its open land in order to provide for the pasture and crop land used by the teaching farm program. The solar array project will cover only 4.2 % of the total acres on campus. It will involve harvesting just 4.8% (15 acres) of the campus woodlands, leaving 95.2% of the campus forest cover intact and covering 10 acres of pasture or cropland, leaving 95% of the pasture and cropland total still available.

- 2. Why are higher-elevation solar arrays not being considered that would allow for a dual use – electricity would be generated and they could provide shade for animals grazing under them?**

The installation cost of high-elevation arrays has not made them a feasible alternative. Also, because the project will be owned and operated by SunEdison, not Tufts, the solar sites must be fenced off from Cummings activities, including our grazing animals. We do anticipate that a tree buffer at the knoll site will be maintained, preserving some shade for farm animals.

- 3. Why were existing building rooftop and solar panel installations in campus parking lots ruled out?**

Roof mounted solar is most cost effective on large expanses of flat roof. Additionally, roof areas should be in mint condition because solar panels are expected to be on the roof for 20 years or more.

Grafton campus roofs tend to have complex lines that are not suitable for solar. The flat roof areas are smaller and often have equipment mounted on them. The equipment casts shadows and makes the installation less efficient. In addition, we anticipate that some roof repairs would be needed sooner than 20 years.

While we are starting to see parking canopy installations in this area, they are substantially more expensive than ground mounted solar. Neither roof mounted solar nor parking canopies can achieve the scale of ground mounted solar.

- 4. Can geothermal options be included as another renewable energy option?**

Geothermal heat pumps, often referred to as ground source heat pumps, are an efficient and renewable energy technology. They are quite compatible with solar energy generation because electricity is required to pump water or glycol through the system.

A small test ground source system is up and running on the Medford campus. We continue to look for appropriate applications for this technology at Tufts.

More information on this technology is available at:  
<http://www1.eere.energy.gov/geothermal/heatpumps.html>

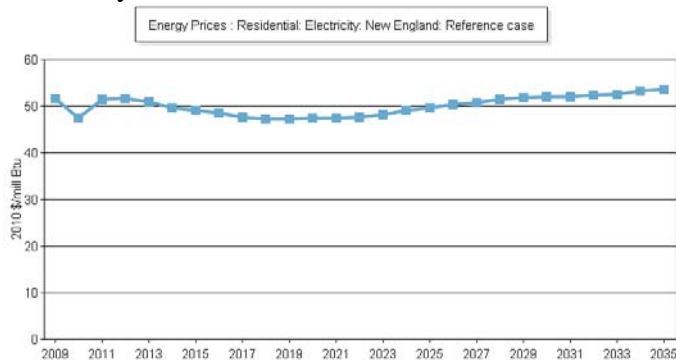
**5. Is there any possibility of unintended and unforeseen costs from this project being passed down to students? Will student tuition be increased in order to compensate for lost farm income? Will farm personnel end up being let go because of the decrease in farm income? Additionally, how will the realized savings from this project be used? Will students see any of the savings?**

Student tuition will not increase because of the project, nor will the project otherwise burden students with additional expenses. The project is being proposed to significantly reduce the Cumming School's electric power costs and, overall, its reliance on non-renewable energy sources.

The decrease in farm income due to reduction in acreage dedicated to feed crops has been factored into the current cost savings projections. Significant energy cost savings will be realized over the 20-year term of the project and will go toward reducing the school's ongoing operating deficit. These savings can only assist in preserving, over the long-term, the school's current functions and workforce, including its essential farm operation and farm staff.

**6. How will the University and SunEdison address the issue of technological obsolescence over the life of the project? Can we assume that solar power will always be cheaper than power from the grid, particularly after 10 or more years of technological advancement?**

Over the course of 20 years, more efficient panels will surely be available. If the economics make sense, SunEdison may choose to replace the panels with newer ones. This is at their sole discretion. It will not impact the cost of the power we buy. Whatever the panel design, we can be certain that the green house gas emissions from solar generation will be zero while the green house gas emissions from fossil fuel generated electricity will be greater than zero. The output of the solar arrays will be purchased by Tufts at a fixed cost for the 20 year period. The U.S. Energy Information Administration's cost forecasts show a modest increase in electric prices over the next 20 years (see graph below). We cannot predict the future, but we can safely assume that our contracted rate will be less than the forecasted price of electricity.



**7. By what criteria were the knoll and Grafton Science Park sites chosen, and who was consulted during the selection process?**

SunEdison engineers and its environmental consultant viewed seven campus sites. Locations with known wetlands, protected habitats (or other environmental constraints), easements or anticipated facilities in the future were not offered for consideration. Sites that were too small to achieve reasonable scale, with the wrong orientation, distant from power grid connection points, or with significant slopes were ruled out.

During the site selection process, farm personnel were consulted and advised of possible sites under consideration. Planning staff made efforts to minimize the impact on the acreage used by the campus farm for growing crops; selection of the knoll site was made, in part, to provide an alternative to another site used to grow hay.

Siting solar panels along Westboro Road (Route 30) was discussed but not considered feasible because of the distance from power interconnection point and elongated configuration.

**8. Is any and all land on the campus a candidate for development? Will development of the knoll and Grafton Science Park sites for solar panels be done in an ecologically sensitive manner?**

Development cannot and will not occur in vernal pools, wetlands or other areas documented to contain habitats of rare or endangered species. The Cummings School campus includes 169 acres of mostly wooded wetlands, plus additional development buffers not included in the 169 acres. All these acres are already off-limits for development. This is over 30% of available campus land and represents an acknowledged, significant development constraint.

The Cummings School leadership strives to be responsible campus land managers and good stewards of the environment. For example, the design and construction of Grafton Science Park infrastructure was completed after, and in full compliance with, state and local environmental review. The Grafton Conservation Agent also reviewed the plans for the New England Regional Biosafety Laboratory during its permitting.

Design and construction of the solar panel projects will also be completed after, and in full compliance, with state and local environmental review. The school believes that the installation and use of the solar panels, according to the proposed plan, will further the University's responsible environmental stewardship, with significant overall reduction in net carbon use in Grafton.

**9. How will the visual impact of developing the knoll site be minimized?**

Concerns were expressed early on regarding the visual impact of solar installations on campus. Views of the targeted area were created that showed before (no panels) and after images (with panels) from multiple angles. The technology used to create these views provides the closest possible approximation of the project's visual impact. Public presentation of these views shows limited visual impact and has eased such concerns. We will consider placement of vegetation

that will further mitigate views of the installations with the caveat that such initiatives not limit access of panels to sun.

**10. Can the Cummings School consider purchasing more agricultural land or clearing some of the dry upland woods on campus, so that more flexibility and less conflict will arise between farm interests and ecosystem preservation?**

Given the small amount of production farm land to be used by the solar installation, purchase of additional land in response to the solar project is unlikely. A decision to purchase additional agricultural land could occur but would be driven by overall costs/benefits rather than the solar initiative.

**11. What is the Tufts/SunEdison Power Purchase Agreement?**

The power purchase agreement (PPA) is an agreement between the University and SunEdison that allows SunEdison to arrange financing, and then proceed with the design, engineering and construction of solar panels on two sites – the Willard Street knoll site and Grafton Science Park site - at an agreed on fixed price (cents per kWh). It acknowledges that SunEdison is responsible for pre-permitting activities (such as completing environmental reviews) and for securing permits. It also acknowledges that any taxes to be paid will be added to the base price and be passed through to Tufts. There are opt-out provisions for each side; for example, if permits are not granted or the taxes imposed result in a non-competitive price for the power. While tax details have not been worked out, Tufts is committed to an arrangement that would be fair and equitable for all parties.