

Proposal Details

G Hendrix

Section 1: Summary Information

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|--|---|
| * Project Title: | Reduction in carbon foot print through improvement in efficiency of HVAC units while providing better environmental conditions. |
| * Duration (months): | 9 |
| * Total Budget (\$): | \$74,990.00 |
| * Requested SGEF Funds (\$): | \$64,990.00 |
| * Matching Funds (\$): | \$10,000.00 |
| * Proposed Starting Date: | 9/1/2017 |
| PI Graduation Date (if applicable): | 5/11/2018 |

Section 2: Applicant Information

| | Full Name | Unit/Department | Phone | Email |
|---------------------------------|---------------|---|------------|---------------------|
| * Principal Investigator | Ashini Vashi | College of Engineering/ Civil and Environmental Engineering | 863-337-89 | aav3@mail.usf.edu |
| Investigator 1 | Suchi Daniels | University of South Florida LEED Coordinator | 813-974-08 | suchitramba@usf.edu |
| Investigator 2 | | | | |
| Investigator 3 | | | | |
| Investigator 4 | | | | |

Section 3: Project Description

* Project background and purpose (reasons motivating request) (Max 500 words)

Outdoor air introduced in the space requires heating and cooling it continuously to remove humidity from the air. This project proposes to provide Building Code required outdoor air through introduction of ionization technology. Building interiors emit VOC (volatile organic compounds) which are harmful to health. To sufficiently dilute VOC's for the air to be safe ASHRAE (American Society of Heating, Refrigerating, and Air-conditioning Engineers) has established standards of outdoor air necessary. In collaboration with the Environmental Health and Safety, Facility Management, and Building Code Official, a pilot project of Ionization (iBar) technology was applied to the sixth floor of USF library's two HVAC units (2) to reduce VOC's which in turn permitted reduction in outdoor air per Florida Building code. This in turn reduced carbon foot print, by reducing cooling and heating loads, and the energy cost. The USF Library is a seven story building served by 12 air handling units. Sixth floor has 34,342 gross square feet served by two air handling units. These two air handling units were retrofitted with iBar technology with data logging for before, and after VOC's and CO2 measurements. The results successfully demonstrated reduction in carbon foot print through use of iBar technology was possible while meeting code requirements. This also improved the quality of air inside the conditioned space. We have chosen the library's remaining 10 units for this project, based on the experience of the pilot project.

* Project activities (Max 250 words)

With SGEF funding, this project will provide iBars to 10 air handling units in the USF Library. The project will be implemented through normal USF construction process of project management which includes, design, bidding, permitting, and installation. Expected time frame for the project for all 10 air handling units is 9 months as it requires shutting down of air handling units. The shutting down of air handling units can be done only during periods of low or no occupancy.

*** Project results (Max 500 words)**

Project results will be communicated to the USF community. It will be a great learning opportunity for the USF students, since it is a technology that has not been previously applied at USF. iBar technology keeps the cooling coil clean. It improves indoor air quality for the building occupants as it reduces VOCs, odors, destroys bacteria and virus, and provides better filtration. Indoor air quality is important because students spend several hours studying indoors. In new construction, reduced first cost since less outside air meant smaller outside air units and smaller ducts and reduced cost due to smaller outside air units requiring less electrical load. Additional benefit is expected from Innovation Credits in next STARS (sustainability Tracking, Assessment and rating System) report. iBar technology also helps in controlling static electricity.

*** Outcomes of the project (Max 250 words)**

The installation of iBar technology is expected to reduce carbon foot print by 46 eMT through reduction of 60,462 kWh of electricity, and 661therms of natural gas, resulting in annual savings of \$51,670.

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|---|------------|
| * Annual Energy Savings | 60,462 kWh |
| Annual Cost Savings | \$6,650.82 |
| Return of Investment in % | 0.10 |
| Annual Green House Gas Reduction | 0.00 |

*** Project Sustainability (Max 200 words)**

Facilities Management has agreed to maintain the iBars, thus ensuring sustainability of the project and no further cost to SGEF.

Section 4: Workplan and Budget Details

*** Detailed work plan/schedule of activities (Max 250 words)**

The project is expected to start with filing of space impact form followed by official bidding process to obtain bids that provide the best in terms of performance and cost. This will be followed by the installation of iBars.

*** Budget breakdown**

| Category | Request from SGEF | Applicant contribution | Total |
|--|--------------------|------------------------|--------------------|
| Personnel (include all involved) | \$5,000.00 | \$0.00 | \$5,000.00 |
| Equipment | \$30,540.00 | \$0.00 | \$30,540.00 |
| Supplies/Materials | \$0.00 | \$0.00 | \$0.00 |
| Contractual | \$7,000.00 | \$0.00 | \$7,000.00 |
| Construction | \$10,000.00 | \$0.00 | \$10,000.00 |
| Other (specify in budget justification) | \$12,450.00 | \$0.00 | \$12,450.00 |
| Total Project Cost | \$64,990.00 | \$0.00 | \$64,990.00 |

*** Budget justification (Max 250 words)**

The project cost for 10 air handling is based on actual pilot project experience for two air handling units. I have budget for engineering design to be \$7,000 and student cost to be \$5,000. Other estimate includes permitting to be \$350 and testing and balance to be \$12,100. To reduce project cost, Facilities Management plans to use in-house resources for construction/installation of the iBar units.

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Proposed Starting Date: As soon as funds are made available.

Annual cost Savings: \$51,670

Return of investment %: The overall project is expected to have simple payback of 1.3 years, which translates to ROI of 76.9%.

Annual Green House Gas Reduction: This carbon foot print reduction is equivalent to, CO₂ emissions from various sources like 45,342 pounds of coal not burned, or 4,781 gallons of gasoline not consumed, or Greenhouse gas emissions from 8,399 miles not driven by an average passenger vehicle, or about 1.1 tons of waste recycled instead of landfilled.