Sustainability Visioning

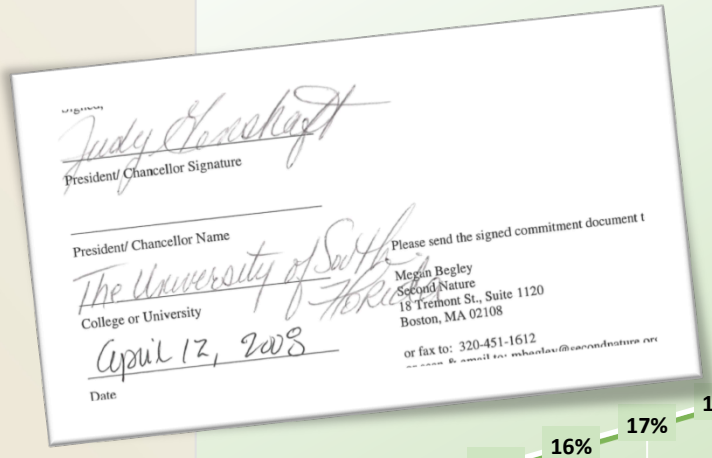
A Win-Win Approach

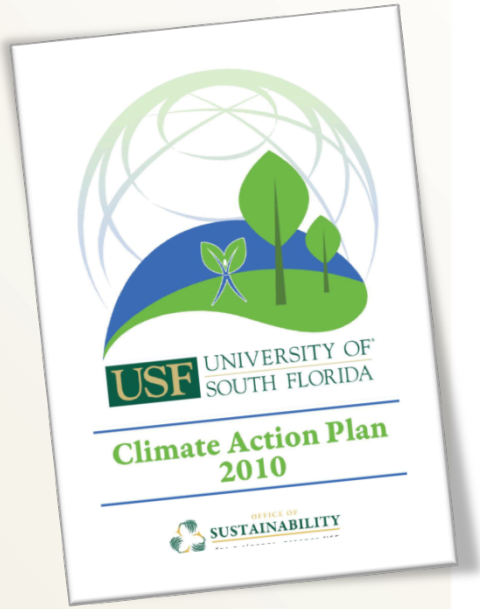
USF
UNIVERSITY OF SOUTH FLORIDA
SYSTEM

Presidents Climate Commitment

AMERICAN COLLEGE & UNIVERSITY PRESIDENTS CLIMATE COMMITMENT

Carbon Footprint Reduction Plan





USF UNIVERSITY OF SOUTH FLORIDA SYSTEM

Student Green Energy Fund

Student Green Energy Fund
2015/2016 Charter

The Student Green Energy Fee assists the University of South Florida with conserving energy, reducing energy costs, lowering greenhouse gas emissions, promoting renewable energy technologies, reducing water usage and/or increasing resource sustainability. With approval from the Florida Board of Governors on March 24, 2011, students at each campus vote in a study body referendum every three years to determine if they support the fee and at what rate.

Student Green Energy Fund

Student Green Energy Fund
2015/2016 Charter

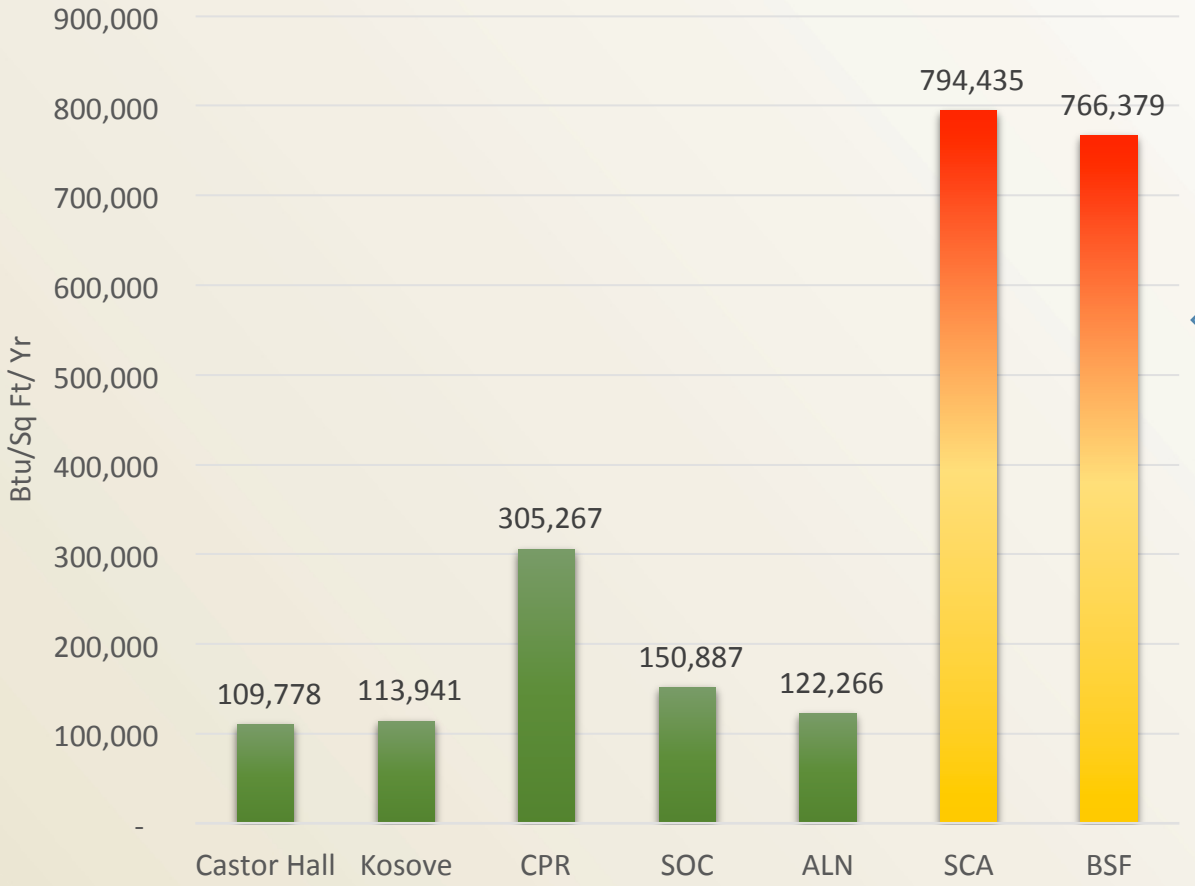
All proposals that seek to use SGEF funds should comply with the following criteria:

- proposals should specify or estimate the return on investment (e.g., KWH reductions, GHG emissions reductions, and/or cost savings realized by the institution),
- project management teams should include a combination of faculty/staff and students,
- projects should seek internal/external funding matches or cost sharing with other units,
- proposals should show how the projects align with the USF Strategic Plan and/or Master Plan,
- proposals should demonstrate the sustainability of the project after the budget period has ended (e.g., a statement from the benefitting unit committing to maintain the project after the budget period has ended), and
- projects should enhance student success and contribute to institutional sustainability.

Developing Cost Effective Targeted Savings Strategy

- Review large users of energy
- Review cost of energy by energy type
- Review energy use by energy type

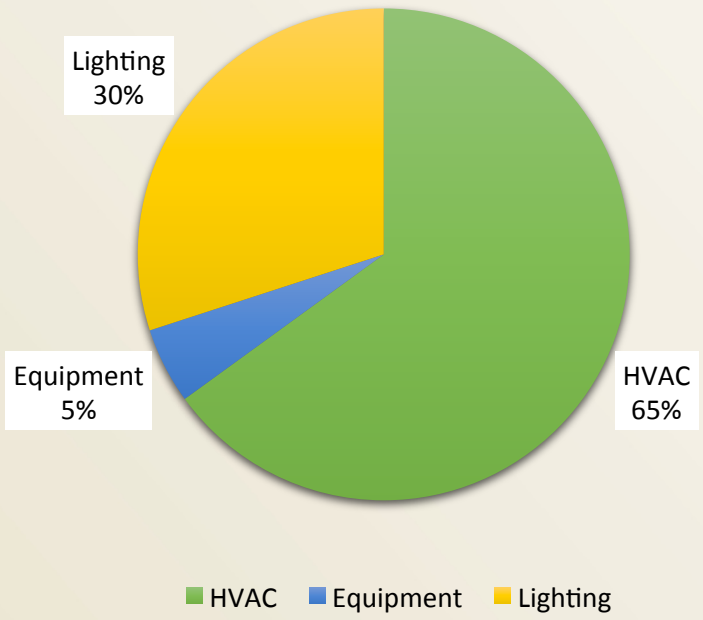
Developing Strategy – Review Large Users



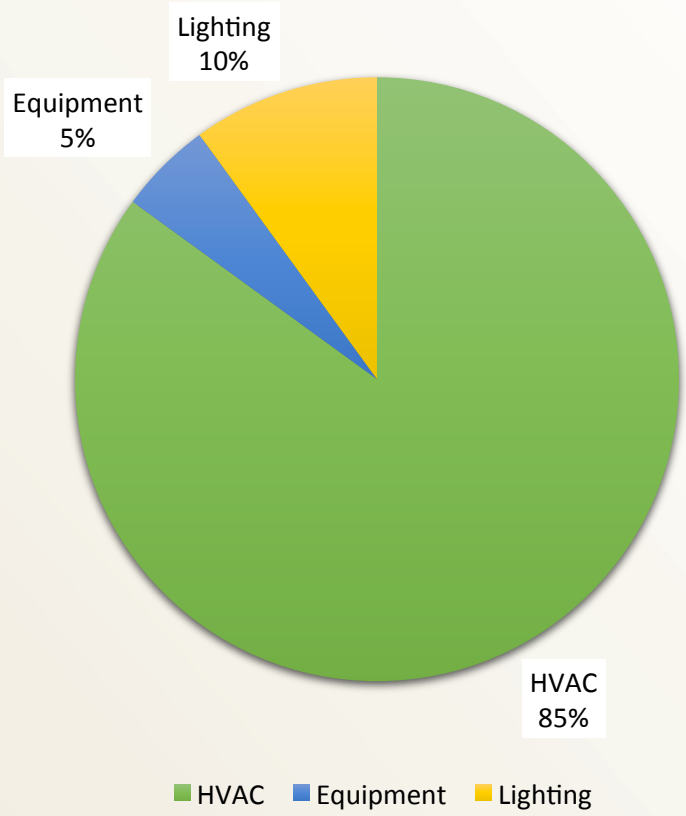
Research facilities are heavy users of energy due to exhaust hoods that require 100% outdoor air in the building.

Building Energy Use

Non-Research Buildings



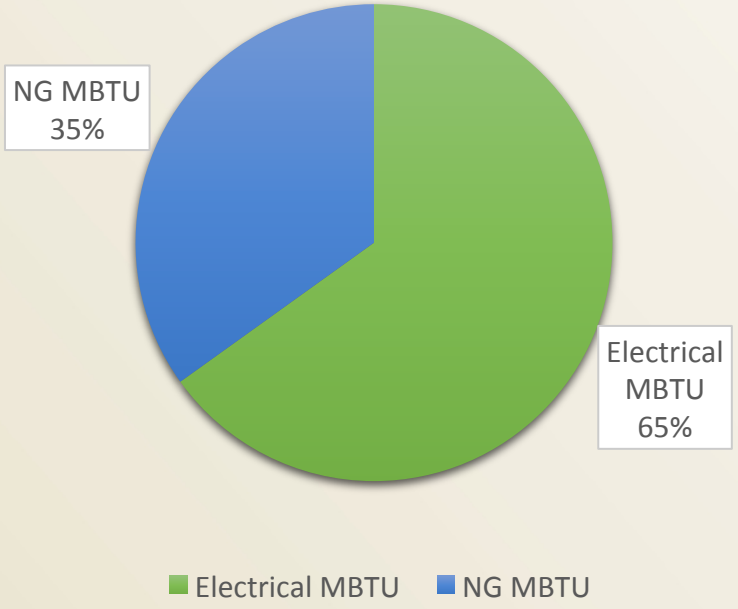
Research Buildings



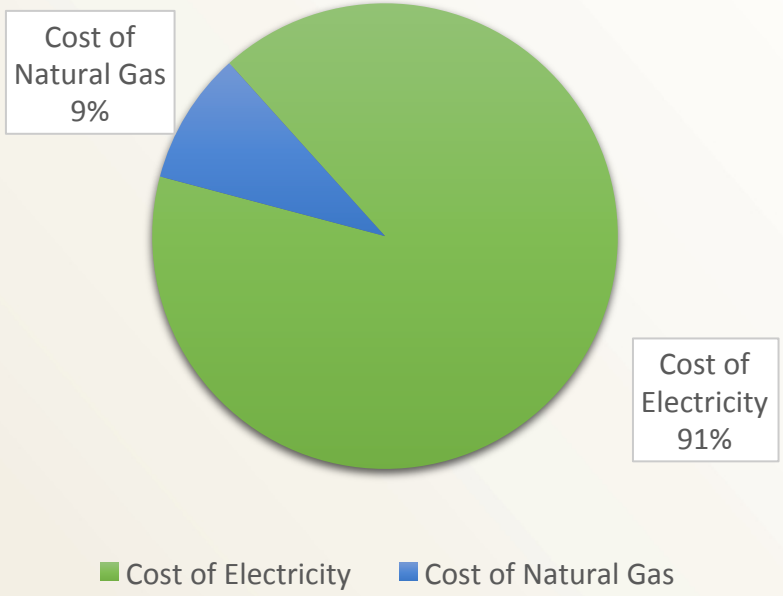
USF Tampa Energy Mix

Purchased Utilities for FY 15-16
Electricity and Gas only

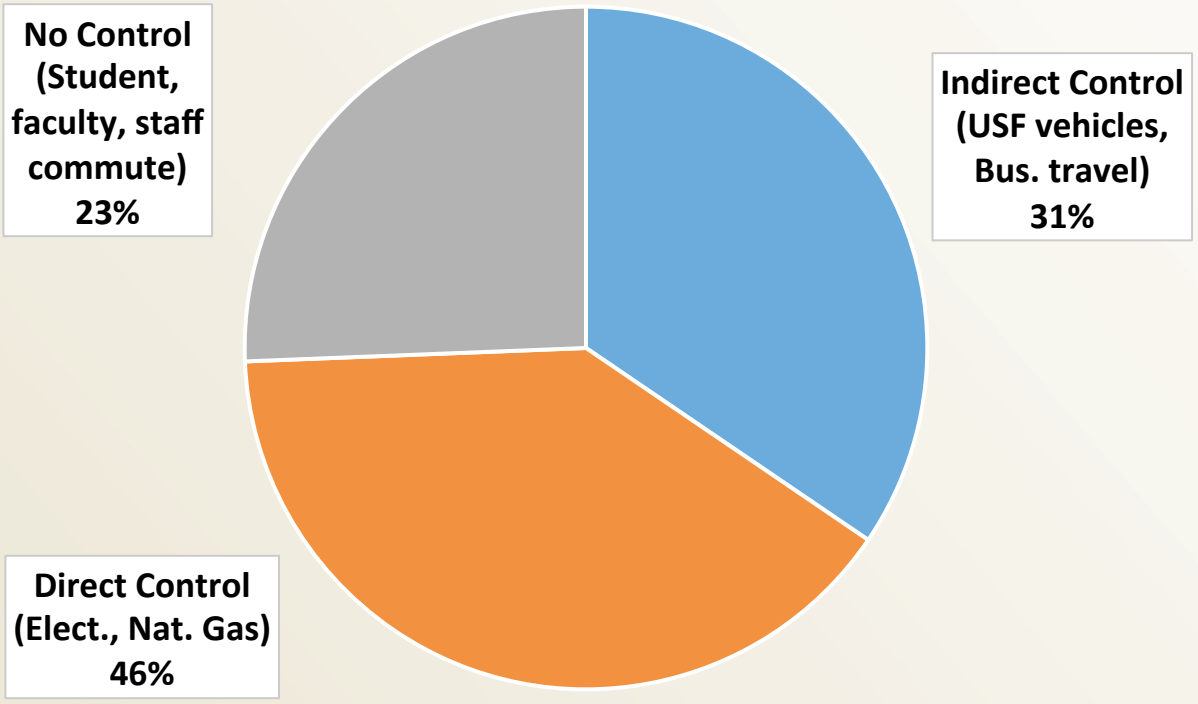
Energy Mix



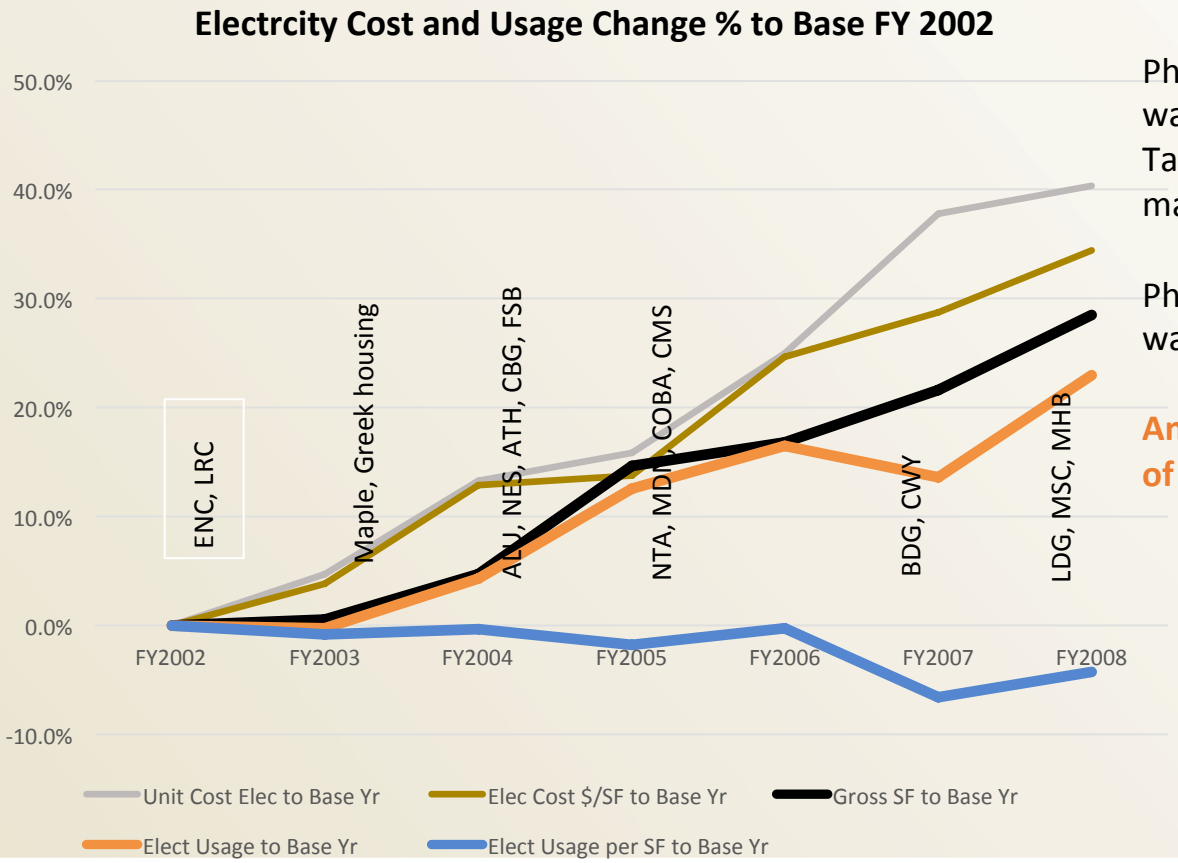
Energy Cost



USF Tampa Total Carbon Split



Proven Record – Lighting Efficiency Improvements



Phase 1: All lighting converted to 32 watts T8 and electronic ballast for entire Tampa campus, from 40 watts T12 and magnetic ballasts

Phase 2: All lighting converted to 28 watt T8 lamps.

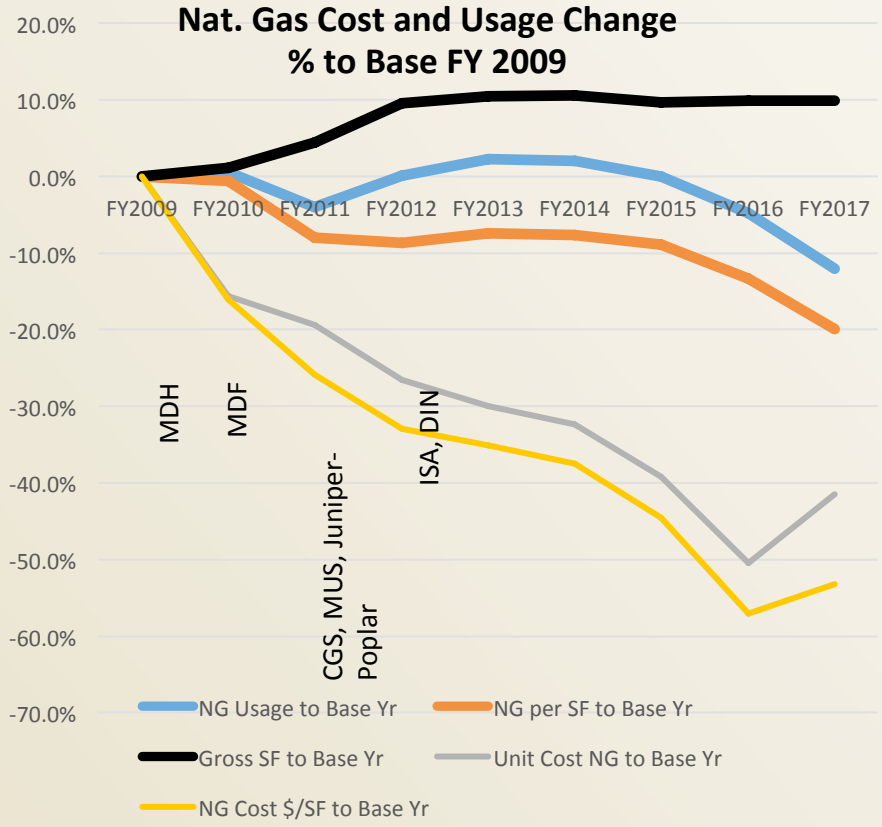
Annual savings in Electricity, in excess of $1 million/yr.

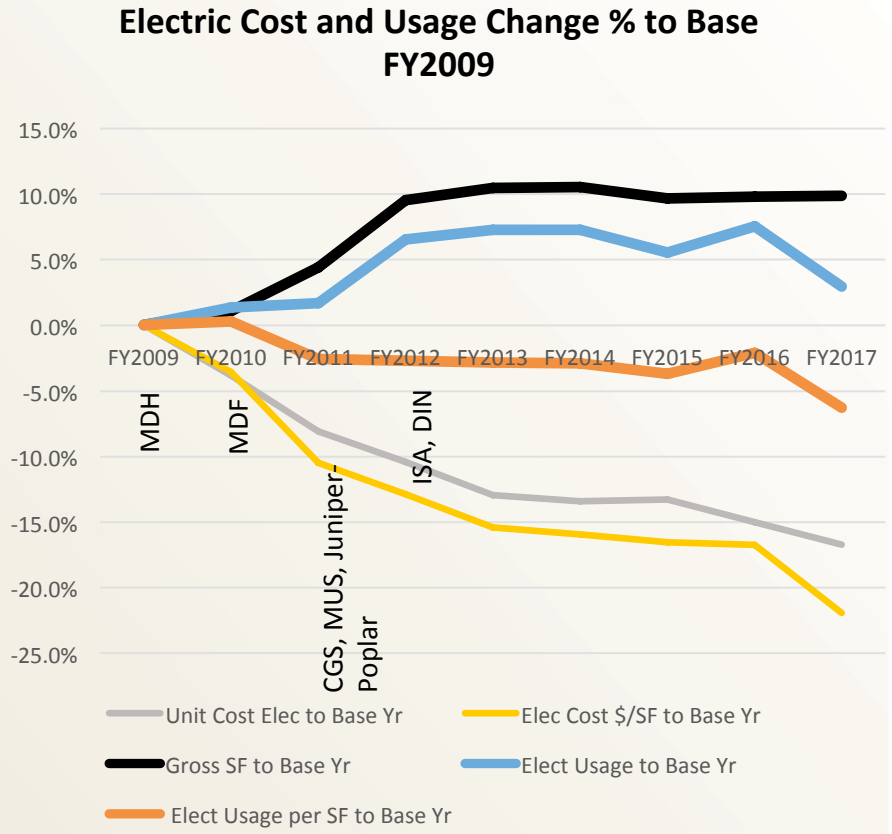
Success Story – Heat Pipes and CPT Efficiency Improvements

- "Heat Pipes" a heat recovery system, saves on electricity and gas usage. USF has over 45 installations, largest in the country.
- **Annual savings in excess of $500,000/yr. Payback achieved 4.2 years.**

- Chilled water distribution from CPT to the Tampa campus - optimized.
- **Annual savings in excess of $165,000/yr. Payback 4.5 years.**

Success Story – Heat Pipes and CPT Efficiency Improvements





Lighting Energy

- 1st Cycle – T12 to T8 fluorescent 50 watts to 32 watts
  Saved: $1.5 million/yr, 11 million kWh/yr, 2.4 MW, 600 ton cooling
- 2nd Cycle – Fluorescent 32 watts to 28 watts T8
  Saved: $0.26 million/yr, 1.7 million kWh/yr, 0.43 MW
- 3rd Cycle – Fluorescent 28 watts to 18 watts LED
  BSF building, Beard and Crescent Hill Parking Garages, tennis and basketball courts, walkways, roads, and parking lots

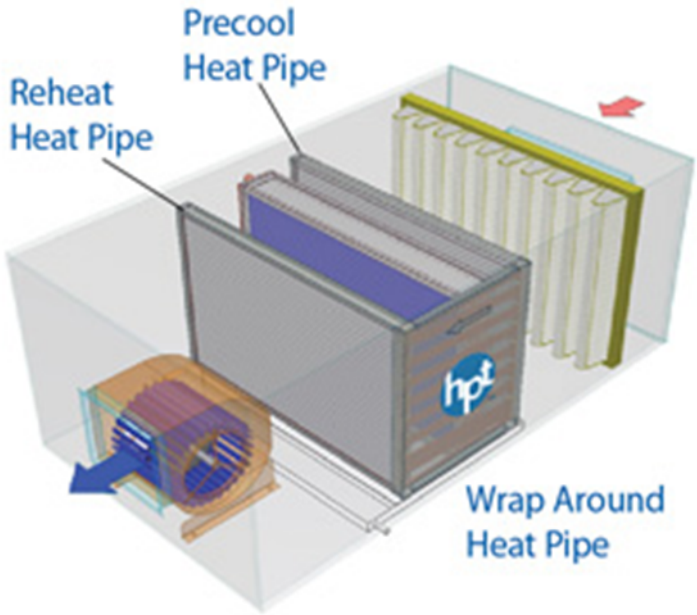
Exhaust Hood Retrofit

Automate Sash Closure & Related Controls

- BSF-151 two exhaust hoods are modified as pilot project.
- Tampa campus has 519 exhaust hoods
- Investment:$ 8,138,539; Savings: $ 1,477,395; Payback: 5.5 yrs
- https://www.youtube.com/watch?

Heat Pipes Energy Recovery

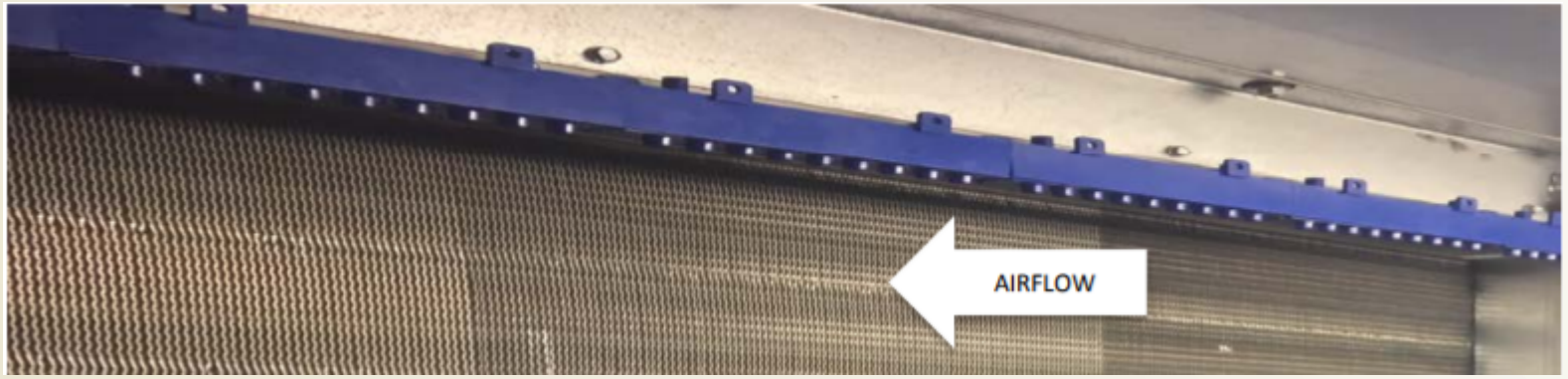
- Special heat exchanger between intake and exhaust air
- Reduce and recover energy used for pre-conditioning intake air
- Proven and tested at USF campus
- No moving parts, minimal maintenance



Improve Air Quality through I-BAR

- Bi-polar ionization generator
- Custom designed or retrofit
- Attracts germs and particles
- Reduced outdoor air requirement and thus energy use

- Heat pipes + Ibar Investment $5,000,000, Savings $664,286/yr; Pay back 7.5 years



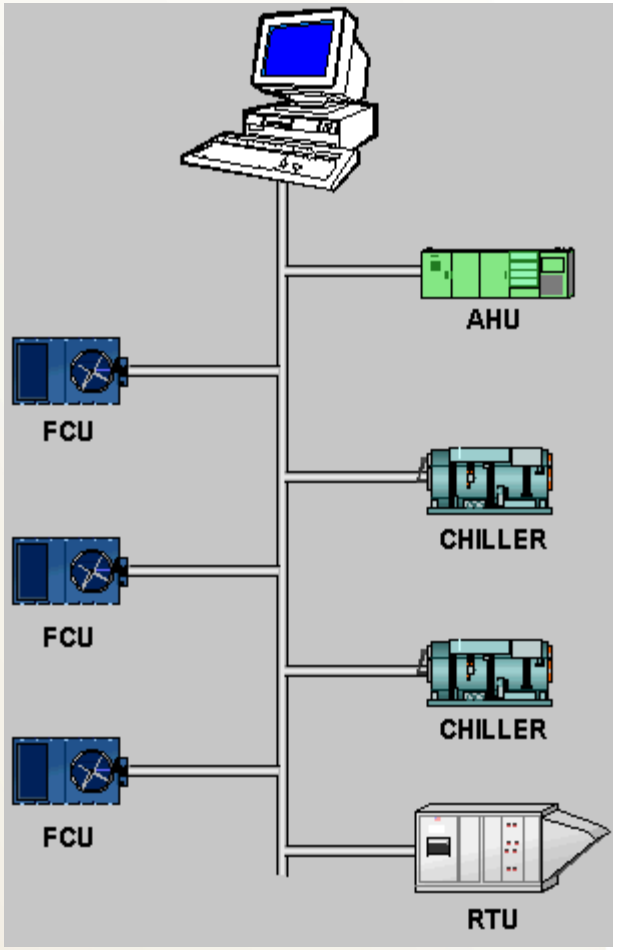
HVAC Controls and Infrastructure Upgrade

- Upgrade of HVAC controls to DDC controls
- Bring accuracy of modern electronics and sensors to building automation

  Investment:$ 8,500,000

  Savings: $ 944,444/year

  Payback Period: 9 years



Roofing Upgrades

Highly Reflective Roof & More Insulation

Investment: $2,000,000

Savings: $285,716/yr

Payback: 7 years

Solar PV and EV Charging

UNIVERSITY OF SOUTH FLORIDA SYSTEM

NEUTRALIZE BULL GAS

A Student Initiative

to reduce commuter carbon foot print

USF UNIVERSITY OF SOUTH FLORIDA SYSTEM

The Cost Reduction Plan

FY 17-18 Phase 1	BSF & NES 165 Exh. Hood Retrofit	$ 2,589,709	$ 469,715	5.5
	Campus LED Retro. Ph. 1	$ 3,589,275	$ 484,194	7.4
	Heat Pipes & iBars Ph 1	$ 1,000,000	$ 132,857	7.5
	HVAC, Controls, Infrastructure Ph 1	$ 2,500,000	$ 277,778	9.0
	Roofing Upgrades (insulation, reflective roof) Ph 1	$ 500,000	$ 71,429	7.0
	New technologies, efficiency improvement initiatives	$ 100,000		
	Project Management OPS staff and students	$ 150,000		
	Purchase Renewable Energy Credits and Carbon Offsets	$ 20,000		
	FY 17-18 Totals	**$ 10,448,984**	**$ 1,435,973**	**7.3**

FY 18-19 Phase 2	Campus 177 Exh Hood Retro. Ph. 2	$ 2,774,415	$ 503,840	5.5
	Campus LED Retro. Ph. 2	$ 3,589,275	$ 484,194	7.4
	Heat Pipes & iBars Ph 2	$ 1,000,000	$ 132,857	7.5
	HVAC, Controls, Infrastructure Ph 2	$ 2,500,000	$ 277,778	9.0
	Roofing Upgrades (insulation, reflective roof) Ph 2	$ 500,000	$ 71,429	7.0
	New technologies, efficiency improvement initiatives	$ 100,000		
	Project Management OPS staff and students	$ 150,000		
	Purchase Renewable Energy Credits and Carbon Offsets	$ 20,000		
	FY 18-19 Totals	**$ 10,633,690**	**$ 1,470,098**	**7.2**

FY 19-20 Phase 3	Campus 177 Exh Hood Retro. Ph. 3	$ 2,774,415	$ 503,840	5.5
	Campus LED Retro. Ph. 3	$ 3,589,275	$ 484,194	7.4
	Heat Pipes & iBars Ph 3	$ 1,000,000	$ 132,857	7.5
	HVAC, Controls, Infrastructure Ph 3	$ 2,500,000	$ 277,778	9.0
	Roofing Upgrades (insulation, reflective roof) Ph 3	$ 500,000	$ 71,429	7.0
	New technologies, efficiency improvement initiatives	$ 100,000		
	Project Management OPS staff and students	$ 150,000		
	Purchase Renewable Energy Credits and Carbon Offsets	$ 20,000		
	FY 19-20 Totals	**$ 10,633,690**	**$ 1,470,098**	**7.2**

FY 20-21 Phase 4	Campus LED Retro. Ph. 4	$ 2,392,850	$ 322,796	7.4
	Heat Pipes & iBars Ph 4	$ 2,000,000	$ 265,714	7.5
	HVAC, Controls, Infrastructure Ph 4	$ 1,000,000	$ 111,111	9.0
	Roofing Upgrades (insulation, reflective roof) Ph 4	$ 500,000	$ 71,429	7.0
	New technologies, efficiency improvement initiatives	$ 100,000		
	Project Management OPS staff and students	$ 150,000		
	Purchase Renewable Energy Credits and Carbon Offsets	$ 20,000		
	FY 20-21 Totals	**$ 6,162,850**	**$ 771,050**	**8.0**

Total Funding Request	$ 37,879,214	$ 5,147,218	7.4

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The Business Approach at Energy Cost Reduction

- Projects are based on tested and proven technologies with low risk.
- Savings are measureable and determinable.
- Frees up resources without impacting any programs.
- Addresses deferred maintenance and capital renewal needs.
- Assured and consistent high returns with short simple payback.
- Return of 13.5% compared to market returns of 7%.
- Proven track record of delivering savings on past projects.
- Savings are not inflated on projections of commodity prices.
- Savings are calculated at current low commodity prices.
- Savings will increase if the commodity prices increase.
- Proposal is based on internal funding.
- We have the internal expertise for successful implementation.

And the winners are…envelop please

- A large number of student internships will be created to give hands-on learning experience.
- We will have student testimonials showing Student Success.
- Improvement in STARS rating system.
- Reduce USF's carbon footprint.
- Help meet the USF's Climate Commitment.
- It's the right thing to do.
- Involvement of student groups.

SGEF Projects at USF Tampa

Solar PV Projects

- 350 kW, 35 kW MSC roof solar PV
- 20 kW solar panels at CUTR
- Solar umbrellas with electronics charging stations

Lighting Conversion Projects

- Convert 3 out of 4 parking garages to LED
- 942 Roadway and Parking Lot light LED conversion
- Bio-Science building LED conversion
- Tennis and basketball court conversion to LED.
- Induction lighting for pedestrian walkways, and Central Plant

HVAC Efficiency Improvement Projects

- Condensing boiler for pool water heating
- HVAC upgrade in dorm facilities
- Solar thermal tank for electric power generation

Electric Vehicles, Bio-diesel, and Transportation Projects

- Electric Vehicle charging stations (15 units 2 sided)
- Biodiesel production for Bull Runner buses
- 40’ Electric Bus and charging station for campus routes
- Share-A-Bull GPS bikes

Other Carbon Footprint Reduction Projects

- 50+ hydration stations to refill water bottles
- Computer shutdown software at night
- 142 Oak and other trees for shade and cooling effect.
- Reducing USF’s CO2 emissions with algae
- 3 Exercise equipment that produce electricity
- Purchase Renewable Energy Credits and Carbon Offsets

Projects Under Consideration

- Exhaust hood retrofits to automate the sashes
- HVAC controls upgrades to DDC from pneumatic
- 4th parking garage LED conversions
- 2nd Electric Bus