

ENERGY EFFICIENCY AND CONSERVATION
AT
Johnson C. Smith University



EDF CLIMATE CORPS
PUBLIC SECTOR

JON YEE
M.B.A. GRADUATE
CLASS OF 2009



UNC
KENAN-FLAGLER
BUSINESS SCHOOL

Executive Summary

Overview

The Environmental Defense Fund Climate Corps Fellowship program trains M.B.A and other graduate students and places them in businesses and universities across the country to help their host institutions identify opportunities to reduce their energy consumption and impact on the environment. The EDF hired recent UNC Kenan-Flagler Business School graduate, Jon Yee, to work with Johnson C. Smith University (JCSU) to help JCSU develop a list of possible energy conservation measures and prioritize those measures based on expected impact, investment required, expected payback period, and ease of implementation.

Analysis and Results

The fellow identified several energy efficiency measures across the campus, the results of implementing these measures would be an estimated annual reduction in energy costs by \$228,389, nearly 25%, if the projects are implemented. The annual reduction of more than 2,377,700 kWh is enough to power 215 residential homes a yearⁱ, and the annual reduction of 1,204 tons of carbon emissions is equivalent to taking 194 SUVs off of the road each year.ⁱⁱ The summary of recommended projects below contains high priority, short term and long term recommendations for reducing energy costs and CO₂ emissions.

Project	Cost (equipment & labor)	Annual Energy Savings (kWh)	Annual Cost Savings	Payback (years)	CO2 Reduction (tons)
Summer Residence Hall Usage	\$0	649,220	\$56,482	Instant	334
Energy Education and Awareness	\$5,000	535,632	\$46,600	0.11	276
Vending Machine Lighting	\$225	21,900	\$1,905	0.12	11
Gym Hot Water Tank Insulation	\$1,000	44,483	\$3,870	0.26	23
Programmable Thermostats	\$5,900	101,000	\$21,500	0.27	52
Occupancy Sensors (Academic & Dorm)	\$12,981	209,533	\$21,115	0.61	108
Computer Management Software (50%)	\$11,500	111,696	\$8,743	1.32	58
VendingMisers (42% Savings)	\$4,700	36,691	\$3,192	1.47	19
LED Exit Signs (Academic & Dorm)	\$10,080	14,310	\$4,495	2.24	7
T12 --> T8 Lighting (Academic & Dorm)	\$118,429	485,541	\$49,372	2.4	250
Frictionless Chiller (20% Savings)	\$153,000	127,753	\$11,115	13.77	66
Total	\$322,815	2,337,759	\$228,389	1.41	1,204

Conclusion

The EDF Climate Corps Public Sector fellow performed a detailed assessment of JCSU's energy usage and recommended several projects to reduce energy costs and carbon emissions by making the university more energy efficient. By becoming a more efficient campus, JCSU will not only be able to reduce its operating expenses but become a model campus for energy efficiency. Both the staffs at JCSU and EDF were critical to the success of this project.

ⁱ US Department of Energy, http://www.eia.doe.gov/ask/electricity_faqs.asp#electricity_use_home

ⁱⁱ Environmental Defense Fund, http://www.edf.org/documents/2209_CarEmissionsFactSheet.pdf