

# Energy Efficiency and Conservation at North Carolina Central University



## ENVIRONMENTAL DEFENSE FUND

### CLIMATE CORPS FELLOWSHIP

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SCHOOL OF BUSINESS  
MASTER'S OF BUSINESS ADMINISTRATION



# Executive Summary

## Overview

The Environmental Defense Fund Climate Corps Fellowship program trains M.B.A, and M.E.M, students and places them in businesses and universities across the country to identify ways of cutting energy consumption and operating expenses. The Environmental Defense Fund (EDF) and North Carolina Central University (NCCU) partnered together to place two Climate Corps Public Sector fellows in the Facilities Management Department at NCCU to address concerns over rising energy consumption and operating expenses. The state of North Carolina in recent years has emphasized energy efficiency in state buildings and institutions. With energy consumption and energy costs spiraling out of control across the state, the state has mandated that all state universities must reduce their energy consumption 20% by the year 2012. NCCU has set its own goal of also significantly reducing its carbon footprint and emission of greenhouse gases. NCCU was the first university to host Climate Corps Public Sector fellows in the country.

The Climate Corps fellows spent ten weeks looking at the entire campus of NCCU in areas such as lighting, natural gas usage, HVAC, ambient temperatures, insulation, windows and LEED recommendations for new construction sites. After conducting a thorough analysis, the fellows targeted specific areas and buildings on the campus in which energy conservation measures are implementable and cost-effective.

## Analysis and Results

The Climate Corps Public Sector fellows identified an estimated total of \$2,562,400 in annual energy cost savings at NCCU. This represents a 64% reduction in annual energy costs. The annual reduction of 48,787,400 kWh is enough to power 4,419 homes annually<sup>i</sup> and the annual savings of more than 26,950 tons of carbon emissions is equivalent to taking 4,346 SUVs off of the road each year.<sup>ii</sup> An overview of the energy efficiency projects recommended by the fellows is below:

Project	Costs (Equipment & Labor)	Estimated Annual Energy Savings (kWh)	Estimated Annual Cost Savings	Payback (Years)	CO2 Reduction (tons)
Lighting	<b>\$2,123,781.00</b>	<b>4,741,722.15</b>	<b>\$632,862.70</b>	<b>3.2</b>	<b>2,619.33</b>
Residence Halls	<b>\$0.00</b>	<b>1,145,555.67</b>	<b>\$74,231.69</b>	<b>instant</b>	<b>632.80</b>
Steam Plant/Natural Gas	<b>\$526,643.00</b>	<b>13,235,818.44</b>	<b>\$473,796.00</b>	<b>1.11</b>	<b>7,311.47</b>
Window Film (Pearson Cafeteria)	<b>\$33,363.54</b>	<b>73,552.78</b>	<b>\$4,766.22</b>	<b>7</b>	<b>40.63</b>
Make-up Air Units (Pearson Cafeteria)	<b>\$42,000.00</b>	<b>1,624,830.06</b>	<b>\$49,415.00</b>	<b>1.17</b>	<b>897.56</b>
HVAC Set-up/Set-back/Shutdown	<b>\$0.00</b>	<b>27,860,023.46</b>	<b>\$1,320,981.37</b>	<b>instant</b>	<b>15,389.88</b>
Vending Machines	<b>\$8,486.99</b>	<b>105,913.00</b>	<b>\$6,354.78</b>	<b>1.33</b>	<b>58.51</b>
<b>TOTALS =</b>	<b>\$2,734,274.53</b>	<b>48,787,415.56</b>	<b>\$2,562,407.76</b>	<b>2.33</b>	<b>26,950.17</b>

## Conclusion

The fellows completed a detailed energy efficiency assessment for NCCU in which they recommended several projects to reduce energy consumption and costs for the university. The fellows are thankful for all of the help they were given by Facilities Management Division and EDF staffs.

<sup>i</sup> US Department of Energy, [http://www.eia.doe.gov/ask/electricity\\_faqs.asp#electricity\\_use\\_home](http://www.eia.doe.gov/ask/electricity_faqs.asp#electricity_use_home)

<sup>ii</sup> Environmental Defense Fund, [http://www.edf.org/documents/2209\\_CarEmissionsFactSheet.pdf](http://www.edf.org/documents/2209_CarEmissionsFactSheet.pdf)