



# Razorback Renewable: A Campus Energy Feasibility Analysis

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## THE PROBLEM

The University of Arkansas has recently agreed on aggressive goals to reduce campus greenhouse gas emissions by 50% in 2020, and reduced emissions to zero by 2040. As such, the Office for Sustainability has created a short term and long term action plan for all aspects of campus sustainability. This study though, aims to look at electricity in particular, and the renewable energy systems used to generate it. This study looked at the feasibility of our school installing a renewable energy system on campus, without tearing down any current structures to do so, and whether or not it is possible for that system to produce our entire campus' electricity consumption.

## THE METHOD

This study looked at the different types of renewable electricity systems, particularly solar and wind, and the costs associated with each. This report also used satellite imaging to map out available rooftop and parking lot space on campus that is feasible for the energy systems.

## FINDING THE SPACE

Finding an accurate amount of space available for PV panels was found by mapping out GPS coordinates on empty rooftops and parking lots.



## PROPOSED SYSTEM

A solar energy system consisting of many one axis tracking photovoltaic panels. This option was found to be most feasible in terms of production and costs. The system uses 260,000m<sup>2</sup> of space to build an interconnected solar array that can produce 41% of our current annual electricity consumption. A 16 year payback period and an estimated cost of \$195 million was found. The system's panels will only be on campus rooftops and shading large campus parking lots as a solar panel roofed lot.

## BY THE NUMBERS

The proposed solar panel system consists of:

- 260,000m<sup>2</sup> of PV panel space used
- 47,084,755 kWh of electricity produced per year
- 41% of campus electricity usage
- \$195 million project cost
- 16 year payback period

## PHOTOVOLTAIC CITY

Almost half of our campus' energy consumption can be produced by photovoltaic panels on almost every rooftop and over some of the campus' largest parking lots. This means shaded tailgating for Razorback fans, and less energy used to cool down hot cars.



## SUSTAINABILITY

The proposed solar energy system would be the biggest campus sustainability project by far. In 2008, the school spent \$25 million on a energy efficiency company to improve current buildings, so the project isn't completely out of the question. The benefits would be major improvements to the built system, less resources used from the natural system, and more control over the managed system. This system would provide nearly half of our electricity needs. That's reducing the amount of coal and natural gas emissions we are putting into the atmosphere, making as very close to our 2020 emissions goal.

This project would prove to be a very important learning point for students and faculty as well. It would give students the chance to have hands on experience with the future of our energy production. Not only the students working on the project, but the students on campus who will see all of the PV panels daily will be reminded to be more conscious of the goal to live more sustainably.