



UNIVERSITY OF ARKANSAS

# Reducing Energy Expenditures

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## THE PROBLEM

The University of Arkansas has sent an average of \$556,094.47 on energy cost every month for the past five years. That is an average of \$6,673,133.64 per year, that means while the average student spends four years on their degree the University will spend \$26,692,534.56 on energy cost while they are in school. Being able to reduce the cost we spend on energy can lower student tuition or create more scholarship opportunities for incoming students. This reduction in energy expenditures can be solved in several different ways but the biggest cost savings option is reducing the amount of energy we buy from SWEPCO.

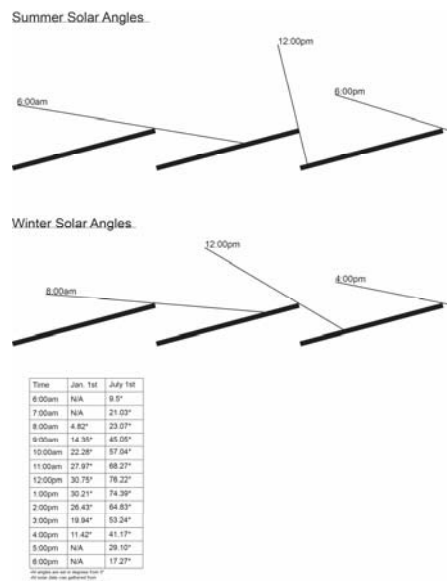
## THE PROJECT

The idea behind my project is to determine one of the ways to reduce energy consumption from the power grid and analyze it to determine the possibility of the outcome. For the chokepoint I have chosen to analyze is the Garland Parking Garage on campus. It is one of the newer buildings on campus and has unused real estate over the open air of the top deck. The solution to the unused real estate is to place a solar grid on top of the parking garage not to impede on the existing parking, because parking is already a commodity on campus.

## GRAPHS



## GRAPHS



## SUSTAINABILITY

Garland Parking Garage has consumed an average of 46,237 kWh every month since its completion in 2010. That is only an average bill of \$3,278.36 out of the Universities total bill of \$556,094.47, which is only a small percentage of the total bill. The Garland Parking Garage offers 107,250 square feet to allow a total of 4,800 solar panels to be installed on a structural steel grid. This steel grid will set on top of the structural columns that make up the parking garage. This will still allow for people to park on the top level and still allow enough ventilation for the air quality. The optimal outcome for this solar grid will produce 33,247 kWh which will produce 72% of the power needed to operate the building. If LED lighting was to be installed throughout the building and more optimal building management was to be put into place to reduce the total consumption of power that 72% could become closer to 100%. This will save the University \$27,927.48 a year on energy cost.

The University of Arkansas takes pride in its sustainable efforts. We are currently trying to make the school zero waste by 2021 so why not expand those goals to reach a certain level of energy dependence that is attainable. The money that the University will be saving can be put back into some of these programs, lower tuition cost, and even create scholarships or research grants. By offering these scholarships or research grants it will allow for more student involvement in the Universities sustainable efforts and more national recognition.

## THE OUTCOME

The result of this project will start a path to decrease the amount of energy dependence by the University and help get student involvement with sustainable projects in the future. By reducing the amount of money the University spends on energy it can lower cost of tuition and create scholarships and grants for students who want to pursue a path in sustainability. This project will lay the ground work and determine if this is a sustainable solution for the university. If this is a viable option for future projects that are similar the University will be able to produce 135,600 kWh if installed on top of Harmon Parking Garage and in the remote lot by Baum Stadium. That would save the University \$141,831.48 a year on its energy bill.