

# Cummins Energy Saving

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Team Number: Team 2

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1. Dpb11f
2. Wab10
3. Dac10c
4. Krf11b
5. Mjf12g

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## Abstract

Cummins needs to reduce the power consumption at their technical center in Indiana by 10%. Team 2 has met with Roger England, the Cummins sponsor, and discussed the initial steps needed to make this a successful project. Weekly team meetings have been held and team members have established positions and a team dynamic. In order to complete the project successfully a rough draft of how to reduce the power consumption by 10% will be completed by the end of fall. The team will start back in the spring with a trip to the Cummins technical center to complete a survey of the facilities.

# 1 Introduction

Team 2 has been asked by Cummins to reduce the power consumption at their Technical Center in Indiana by 10%. In 2011 Cummins began to supplement some of their power sources in certain locations with solar panels, and has since been attempting to reduce power consumption by conventional means. In order to solve this problem the idea of solar panels and a grid monitoring system have been presented to assist in the consumption reduction. Team 2 will create a power consumption reduction plan for Cummins that is both economically and environmentally efficient.

## 2 Project Definition

### 2.1 Background research

Since 2011 Cummins has implemented solar cells as an alternative means of power in several of their facilities. Presently the company has five solar arrays capable of generating up to 230kW. While this is an impressive feat Cummins is looking to further capitalize on cleaner, more efficient sources of energy. <sup>1</sup>

Florida State is in a unique position to assist in solving this problem with their Off-Grid Zero Emission Building (OGZEB). The OGZEB is a prototype used to test the feasibility of solar power in residential buildings. By utilizing the power monitoring systems in the OGZEB Team 2 will have the ability to do the necessary research to solve the problem for Cummins. <sup>2</sup>

### 2.2 Need Statement

The Cummins Technical Center in Columbus, Indiana is looking to reduce their power consumption by 10%. While Cummins has already made great strides in reducing power consumption in their company, they believe there is still more work to be done. Cummins has asked Team 2 to look at the efficiency and feasibility of solar cells as well as rerouting power from dynamometers back to the grid. Additionally, Cummins would like a method to monitor the power grid in order to reroute power and eliminate waste.

Cummins needs to reduce their energy usage in order to save money and reduce their environmental impact.

### 2.3 Goal Statement & Objectives

Goal Statement: "Review current Cummins Technical Center (CTC) electrical usage and devise a plan to decrease it by 10% and design a monitoring system."

.Objectives:

- Analyze feasibility of implementing solar panels for energy generation based on weather, altitude, and longitude conditions

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<sup>1</sup> "Cummins Explores Solar to Help Power Facilities."

<sup>2</sup> "Off-Grid Zero Emission Buildings."

- Measure electricity consumption
- Evaluate current processes
- Create a pareto graph to show opportunities to reduce electrical consumption based on capital invested
- It has to decrease the energy consumption by 10%
- Creation of a monitoring system for energy consumption

## 2.4 Constraints

The project must be completed under the following constraints:

- Any methods applied for reduction in power consumption must be cost effective for potential capital invested
- The monitoring system must cost less than \$2000, our allotted budget for a working system
- Any power saving ideas (e.g. Solar Panels) should apply to weather conditions for Columbus, IN

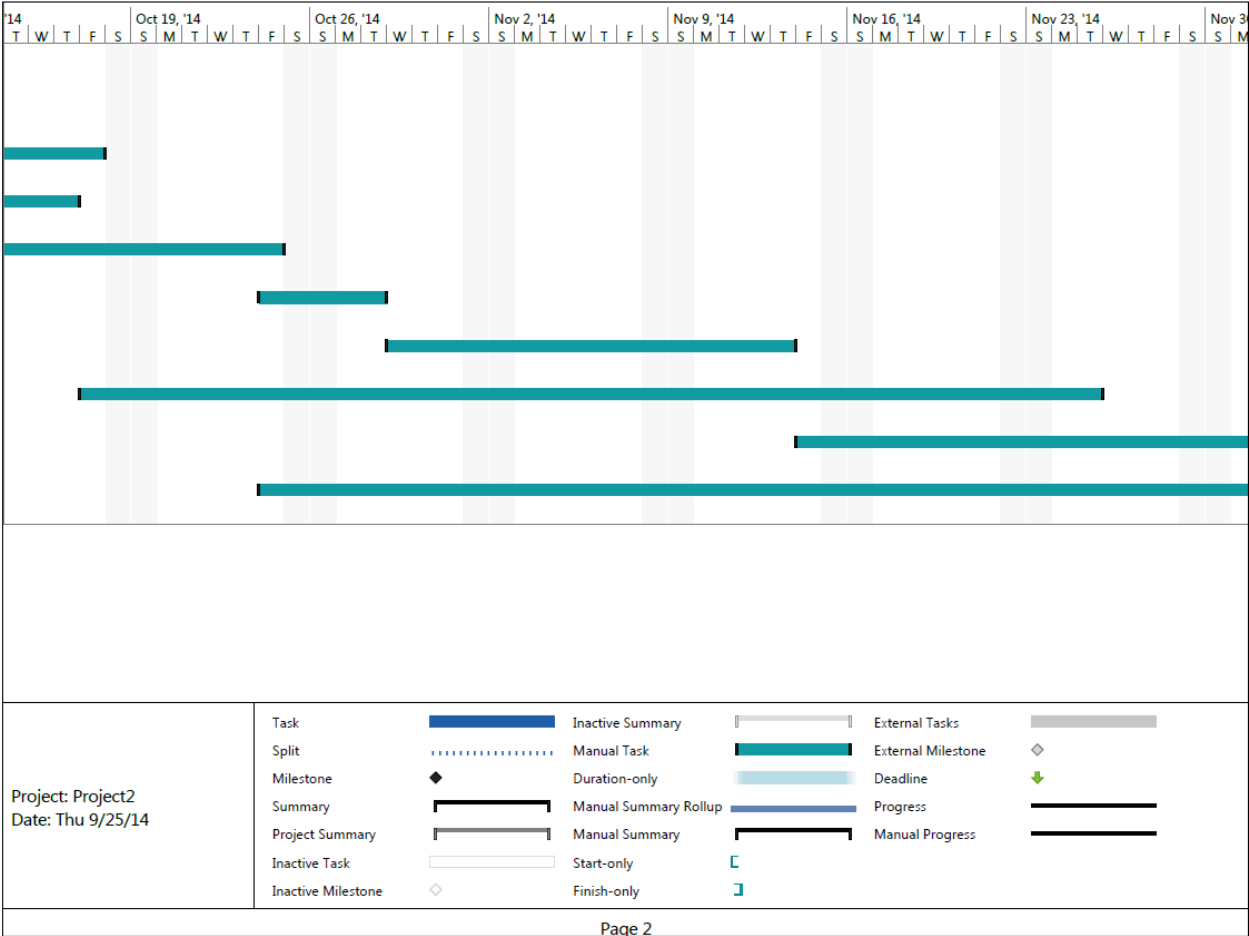
## 2.5 Methodology

To complete this project within the deadline, Team 2's first priority will be to gather pertinent information. First and foremost, Team 2 will be researching the Technical Center through their Cummins's sponsor Roger England. It will be important to understand the priorities of Cummins and ensuring that the company gets exactly what it needs. The Off Grid Zero Emission Building will be another valuable resource to research grid monitoring systems.

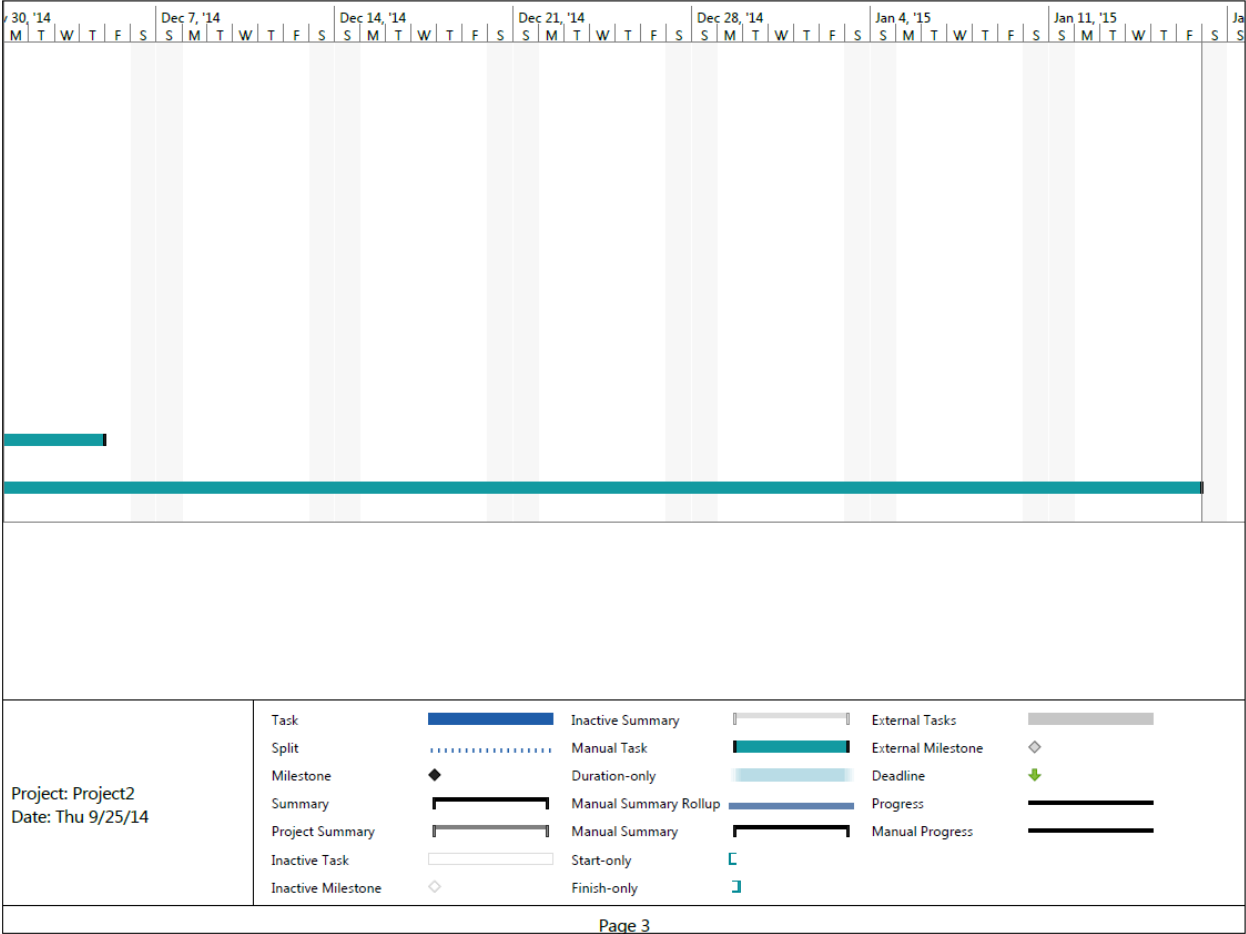
Every two weeks Team 2 plans to talk with their advisor, Dr. Ordonez, to provide updates and gather insight on how to move forward. Each step forward will be documented weekly on the website by Marvin Fonseca, the webmaster. Once Team 2 obtains the necessary information to proceed they will create a draft of the overall energy saving plan.

Daniel Baker, the financial advisor, will create a budget for the grid monitoring system once the plans are complete. Additionally, he will also create and forward a travel budget to Cummins. This travel budget will be used to fly to Indiana and walk through









### 3 Conclusion

By the end of the fall semester, Team 2 is going to have a solid foundation to move forward with the power saving plan when they visit the CTC in the spring. Constant communication with advisors, sponsors, and team members will be the key to successfully completing the project. Once the project is complete the CTC will cut their power consumption by at least 10%, thereby saving Cummins money as well as protecting the environment.

## 4 References

"Cummins Explores Solar to Help Power Facilities." Cummins, n.d. Web. 22 Sept. 2014.  
Off Grid Zero Emissions Building

"Off-Grid Zero Emission Buildings." *FSU*. N.p., n.d. Web. 25 Sept. 2014.