Overview
In order to help Penn State meet their sustainability goals, the Institute of Natural Gas Research (INGAR) challenged us to find a way to better understand and manage the carbon footprint associated with the goods and services purchased by the university. By comparing important sustainability factors against each other, a formula was developed to quantify the relative environmental impact of ceiling tiles from three different manufacturers. By reprioritizing factors and influence, this model can be applied to other purchasing decisions Penn State may encounter.

Objectives
Penn State is determined to reduce their carbon footprint 35% by 2020 from baseline 1990 emissions. Team 3 is responsible for quantifying the emissions from the goods and services Penn State buys, and creating a better system for purchasing more sustainable products.

Approach
- We narrowed the focus of the project to ceiling tiles because they are the most commonly purchased item university-wide
- Investigated the manufacturing process for ceiling tiles and discovered Environmental Product Declarations (EPD) for various makes and models
- Obtained purchasing records from OPP
- Defined what sustainability meant to us
- Determined eight criteria from the EPDs that best represented the sustainability of a product
- Ranked these criteria by importance to PSU and Pennsylvania
- Used an Analytic Hierarchy Process Chart to generate weighted factors for each criterion
- Used the factors as coefficients for a Sustainability Equation
- Gathered and normalized the data from the EPDs for eight different ceiling tile models
- Plugged the normalized data into the Sustainability Equation to determine the most sustainable product and graphed the results
- Analyzed other factors such as cost versus carbon footprint, cost versus performance, etc.

Outcomes
Finally, list the outcomes for this project making sure to clearly convey their implications for the sponsoring company:
- The sponsor has an effective way of comparing different models or manufacturers of the same product to determine which is more sustainable and will help Penn State reach its emissions reduction goal.
- This equation and its factors can be modified to suit any product Penn State desires to investigate.