Overview
The goal of this global project is to identify possible ways to improve the energy efficiency of a Pressure Sensitive Adhesive production line in the Dragon plant (Shanghai, China) by focusing on the water bath-chiller system (PSU) and the heating system (SJTU).

Objectives
Plan a strategy to monitor energy consumption of PSA production line. Construct accurate model of the PSA production line for system analysis. Recommend products to implement monitoring strategy.

Approach
- We began our project analysis by communicating with our sponsor and the SJTU team to set up practical objectives for this project as well as gather customer needs and data related to the production line.
- Since we could not visit the sponsor ourselves, we gathered information about the system layout from the team SJTU team after their site visit.
- The CAD model of the water bath system was created by using Solidwork to help us better understand the setup of the system.
- We researched the existing products and reviewed the relevant patents to suggest products to our sponsor for them to monitor their energy consumption.
- Concept selection and generation were agreed upon after collaboration and discussion with SJTU.
- Thermal dynamic and energy balance equations were used to analyze the efficiency of the water bath system in the production line using Microsoft Excel.

Outcomes
- 544 kW of approximated heat was exchanged per heat exchanger in operation with a 60 ton water bath system and 400 TR chillers.
- Based on received datasets, the ideal cooling capacity of the system would range from 155-159 TR, which corresponds to 38-39% load capacity per chiller, in a 2 chiller system design.
- By installing the automatic meter reading system (ARM), our sponsor can monitor and manage their electricity consumptions by using the software (TRM 2012).
- Analysis of the measured data would provide the optimal operational range for each chiller based on the loading capacity.