Powertrain Design for Shell Eco-marathon UrbanConcept Vehicle

Overview
The team was tasked with designing the powertrain for a highly fuel efficient vehicle. The vehicle was designed to conform to the rules and regulations of the UrbanConcept category of the 2010 Shell Eco-marathon. The powertrain was designed to be reliable and able to withstand the rigors of real city driving while achieving the highest possible fuel efficiency. Finally, the team transported the vehicle to Houston, Texas and successfully competed in the 2010 Shell Eco-marathon.

Objectives
The goal of the team was to design and build an extremely fuel efficient powertrain system for the inherited frame of the UrbanConcept vehicle and successfully compete in the Shell Eco-marathon competition in Houston, Texas at the end of March 2010.

Approach
- Formulated objectives and goals for the 2010 Shell Eco-marathon competition and the UrbanConcept vehicle
- Gathered and weighted customer needs in order to decide on target specifications
- Performed an external search for existing products and patents
- Generated a variety of concepts using the TRIZ method
- Selected a diesel engine configuration
- Developed a risk plan in order to carry out safe practices
- Continued communication with Leroy Bealer, our Shell sponsor
- Manufactured and installed the drive system and ancillary components onto the UrbanConcept chassis
- Tested each independent system and overall vehicle in order to satisfy all safety requirements

Outcomes
- Designed and manufactured a highly reliable powertrain system
- Successfully competed in the 2010 Shell Eco-marathon
- Achieved a fuel efficiency of 154 mpg
- Placed 1st in the UrbanConcept Diesel Category
- Placed 3rd in the overall UrbanConcept Combustion Category