

The ChallengeX Competition

The ChallengeX Competition is a collegiate design competition sponsored by the Department of Energy, General Motors and a number of other sponsors.

17 Universities were given a stock 2005 Chevrolet Equinox to turn into an effective hybrid that reduces emissions, improves fuel economy and maintains or exceeds the performance and drivability of the stock vehicle.



This is a four year competition, Year 1 was modeling the drivetrain with computer simulations, Year 2 was the primary build, and Year 3 is a refining stage leading to vehicles that are 99% ready for the showroom floor. The format for Year 4 is being developed.

UT's Strategy

UT Automotive Engineering prides itself on being a leader in both hybrids and alternative fuels.



Team Tennessee has chosen to use a through the road hybrid and an diesel engine running a B20 blend of biodiesel.

Hybrid Electric System

The stock Chevy Equinox is an all wheel drive vehicle so a through the road hybrid made the most sense.

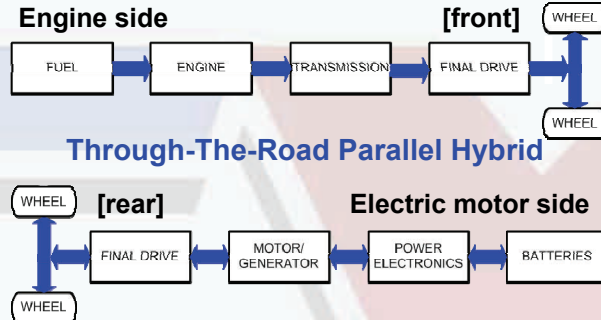
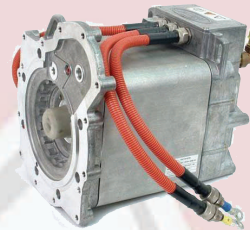


Fig1. The energy flow diagram for UT's Hybrid

The 150HP biodiesel running engine is connected to the front wheels and a 67Kw electric motor is connected the rear wheels.

A computer controls when the 336V NiMH battery pack is recharged during regenerative braking.



Ballard 67 Kw motor



Cobasys 336V NiMH Pack

Regenerative braking allows the vehicle to recover otherwise wasted energy that will be used to drive the motor.

The controls determine when extra power is needed from the motor to save fuel.

Alternative Fuels

The team has installed a 150 HP 1.9L turbo diesel. The diesel runs B20, a blend of 20% biodiesel, to help with emissions and well to wheel energy use.



To further help with emissions, the students are designing an advanced aftertreatment system that combines technologies to reduce unburned hydrocarbons, soot and NOx emissions.



GM 1.9 L Turbo Diesel

By showcasing combinations of alternative fuels and hybrid technology, we hope to inspire a revolution in design. This is why we named our vehicle the Revolution X



REVOLUTIONX

Team Tennessee

AUTOMOTIVE ENGINEERING

Team Tennessee is composed of a faculty advisor, graduate student team leaders and seniors in mechanical and electrical engineering. Students work in teams to solve design problems.

Faculty Advisor:

Dr. David Irick - dki@utk.edu

Team Leaders:

Courtney Lindwurm -clindwur@utk.edu

Shaun Hinds- shinds1@utk.edu

For team or sponsorship information please email the team leaders or visit the website at apcsi.tennessee.edu



Sponsors

Headline Sponsors



Team Sponsors

THE UNIVERSITY of TENNESSEE | UT



apcsi.tennessee.edu

THE UNIVERSITY of TENNESSEE | UT
College of Engineering

Team Tennessee ChallengeX Program



Biodiesel Hybrid Electric Student Design Project



REVOLUTIONX

apcsi.tennessee.edu