



Mechanical/Environmental Sustainability Project

Recovering Lost Heat Energy

Mission Statement

To design and construct a working system that recovers waste heat energy and converts it into useable electrical energy.

Synopsis

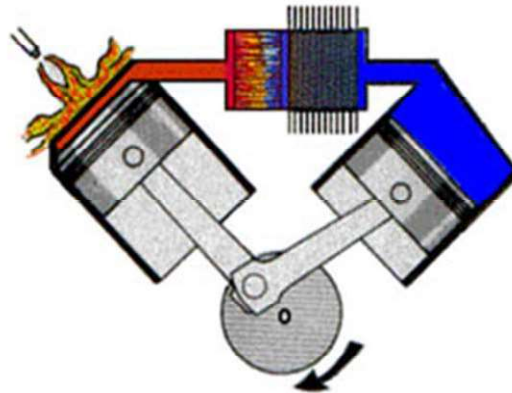
Converting oil (heat energy) to electricity is a well established technology.

Converting waste heat energy into usable work energy such as a rotating flywheel or an electrical generator is the goal of this project. Research and building prototypes on two systems was the mission of this project.

The first system investigated was a magnetic motor Stirling engine. A Stirling engine is a heat engine operating by cyclic compression and expansion of a working fluid at different temperature levels such that there is a net conversion of heat energy to mechanical work. It is the inclusion of a regenerator that differentiates the Stirling engine from other closed cycle engines. The team successfully ran an engine at Housatonic CC (Bridgeport, CT)

The second system investigated, not involving heat, was a Faraday wheel. The Faraday Wheel uses the Lorentz forces created by electrons moving azimuthally through a magnetic field to create a potential difference between different points on the radius of the wheel. The Faraday wheel was one of the first examples of a magnetic field being used to produce electricity. A successful prototype was built and run by the team.

The team learned how harnessing so called waste energy is an important engineering technology.



Edward Graff
Elizabeth Amado
Stephane Jean-Pierre

Quinebaug Valley CC
Gateway CC
Housatonic CC