

Graymark®

GREENtech

Energy Efficiency & Renewable Energy Educational Lab

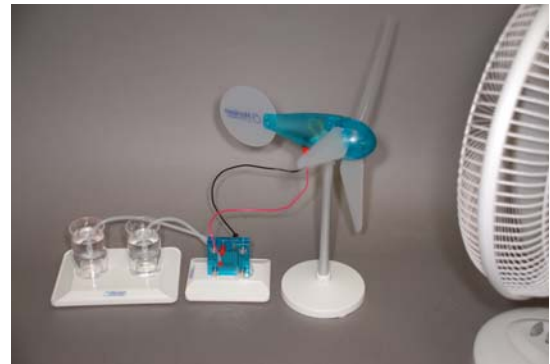


“Green collar jobs represent an important new category of work force opportunities because they are relatively high quality jobs, with relatively low barriers to entry, in sectors that are poised for dramatic growth” Raquel Pinderhughes, Ph. D.

GREENtech is a low-cost turnkey Energy Efficiency & Renewable Energy training Lab that includes all the courseware, hardware, software, tools and accessories needed to provide the basic knowledge & the hands-on skills required to enter the green collar job market.

TRAINING LAB COMPONENTS

- Reversible Fuel Cell
- Wind Turbine w/different blade sizes
- 1-w Solar Panel
- Data Acquisition Board
- Graphic Software
- Hydro Car
- DC Motor with propeller
- 2-AA battery holder
- Student Theory and Lab Manual
- Student Accessories
- Student Tools



Fuel-Cell charged by wind turbine

A wind turbine cannot be efficient at all wind speed conditions. The blades have contradicting requirements at high and low wind speed. With two different blade sizes, students will experiment which blade size to use at low wind speed and which blade size to use at high wind speed.



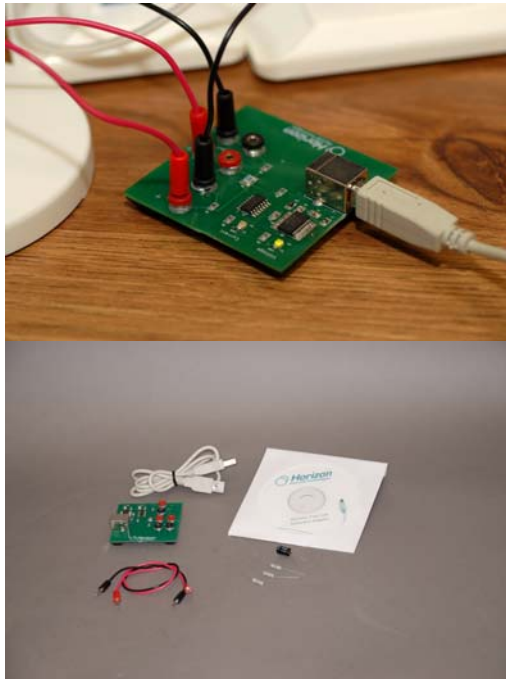
Fuel-Cell charged by a 1-W Solar Panel

In terms of the electrolysis process, the minimum voltage at which water can be split into hydrogen and oxygen is called “decomposition voltage”. Students will experiment what is this minimum voltage required to split water into its component gases of hydrogen & oxygen



Fuel-Cell used to power a car

Reversible fuel cell splits water into Hydrogen & Oxygen gases in electrolysis mode & then recombines hydrogen & oxygen in fuel cell mode to create electricity



Data Acquisition Card & Software

This Data acquisition Board is the electronic interface between devices such as fuel cell, solar panel and wind turbine. When connected to a computer via a USB cable, it measures and computes voltage, current, resistance and power then transmits these electrical quantities 3 times a second to the computer



PC graphic software screen display

The PC graphic software screen is divided into several regions that control how electrical quantities such as voltage, current, power and resistance readings are displayed.

COURSEWARE OBJECTIVES

1. **Understand Types and forms of Energy**
2. **Understand Energy Conservation & Recycling**
3. **Understand Sources Of Energy**
Nonrenewable (Oil, Coal, Fossil Fuels)
Renewable (Sun, Wind, Fuel Cell)
4. **Understand Energy & Resource Management**
Power Grid and Smart Grid
5. **Explore Green Energy & Green Collar Jobs**
Solar Energy, Fuel cells and Wind Energy
6. **Understand Electricity & Electrical Circuits**
7. **Experiment Electrical Measuring Instruments**
Understand Ohm's law

STUDENT TOOL SET

This set contains the tools each student use frequently at the bench and at the trainer.

Each tool set includes:

- Digital Meter
- Electrician's Scissor
- Precision Screwdriver (+)

INSTRUCTOR'S PACKAGE

This set contains the tools for the instructor and testing equipment that are used infrequently by the student.

- Student Courseware Package
- Instructor's Guide

(Optional)

- Site License
- Video Module

Specifications subject to change without notice.