Syllabus: HEA Training 0409

April 13th, 2009 Schedule

Focus:

1. HEA Energy Ball Wind Turbines
2. HEA Solar PV
3. HEA Solar Heat Tubes
4. HEA Bio-Mass Furnace

Course Number: HEA 0409

Course Title: HEA Product Familiarization and Installation

Course Instructor: HEA Staff

Contact Information: vrowe@homeenergyamericas.net

Alternative Contact: Manny Lara, Program Administration mlara@homeenergyamericas.net

Schedule

Date	Time	Description
Monday, April 13th	1 to 4:30 p.m.	Class
	5 to 7 p.m.	Orientation Dinner
Tuesday, April 14th	8:30 a.m. to 4:30 p.m.	Class
Wednesday, April 15th	8:30 a.m. to 4:30 p.m.	Class

Place: 1505 Mercury Circle Suite 100, McKinney, TX.

Prerequisites

Consent of HEA Management and affiliated Distributor or Dealer/Installer, and scheduled for specific training dates.

Course Description

The course provides new affiliates with introductory and support information consistent with HEA product backgrounds, overviews, and installation procedures and options. Students will gain hands-on experience with energy specific technologies; with our product scope as relational to the small energy generation and use field installation practices. This opportunity increases students' occupational awareness and professionalism.

Course Overview

Students will participate in applied learning activities. Example activities include understanding product assembly, wiring, installation, deconstruction, construction, and maintenance of wind turbine and solar PV systems; experiments involving test equipment such as multi-meters; and practice in troubleshooting and problem solving techniques. The practice of health and safety procedures will be stressed.

Course Goal

To provide participants an opportunity to integrate the theory and knowledge of program content with the application of principles and practices in a work environment. We will strive to impart as much information as possible. Additional independent study and research may be required to best serve your local markets. We will continue to provide you with updated and new information as available, and work with you to resolve any customer or field installation issues that may arise. We will support you in every way possible to assure your success.

Course Objectives

Upon completion of this course, the student will:

- Gain practical experience with HEA energy product systems.
- Describe and demonstrate proper safety procedures for working with energy generation systems.
- Describe and demonstrate proper procedures for assembling, installing, maintaining, and troubleshooting HEA energy electric and heat generation systems.
- Describe and demonstrate proper usage of test equipment and tools used in HEA energy generation systems, and installations.
- Interact with colleagues in a professional work environment.
- Participate in a representative range of professional activities in the work setting.

Evaluation Assessment		**Grading Distribution**
Attendance	50%	90 – 100 = A
Classroom & Field Participation	25%	80 – 89 = B
Info Absorbsion (Q & A)	25%	70 – 79 = C
		60 – 69 = D

Information Presentation

1. Company Background, Affiliations, History (HEA, HEI, WWT)
   1 page summary of HEA, HEI, and WWT endeavors (Bob Thompson)

2. Product History (Development, Testing, Installations, Research)
   http://www.homeenergyamericas.com/Energy-Ball.html
   http://www.homeenergyamericas.com/Solar-Power.html
   http://www.homeenergyamericas.com/Solar-Heat.html
   http://www.homeenergyamericas.com/Bio-Heat-Furnace.html

3. Product Performance (Defined, Expectations, Site Conditions)
   http://www.homeenergyamericas.com/Energy-Ball.html
   http://www.homeenergyamericas.com/Solar-Power.html
   http://www.homeenergyamericas.com/Solar-Heat.html
   http://www.homeenergyamericas.com/Bio-Heat-Furnace.html

4. Matching Products to Applications
   Energy Audits, Partial Solutions, Product Combinations, Off Grid Options

5. Product Comparisons (all categories: output, costs, product life, warranty, availability)
   "HEA only offers the best products, and the best opportunity"
   http://www.allsmallwindturbines.com

6. Wind and Solar Maps and other references
   http://www.windpoweringamerica.gov/wind_maps.asp United States Dept. of Energy
   http://www.nrel.gov/gis/solar.html National Renewable Energy Labs

7. Understanding and explaining warranties (Manny Lara)
   Product life expectancy, component warranties, installation and site selection

8. Ordering Equipment, Accessories (Mounts, Poles, Frames, Rails)
   Contact HEA Management (Manny Lara)

9. Scheduling Installations (Importance of, customer contact, confirmations)
   Components/hardware/tools/equipment checklist, time allotment, site pre-survey

10. Customer Service (Good Equipment, good installations = good customers/new sales)
    Installation follow-up, referrals, customer comments

11. The need for Certification (consistencies)
    Knowledge, professionalism, proficiency, preparedness

12. Local Requirements (Permits, Ordinances, Fees, Inspections) Use of local licensed professionals (Electricians, Plumbers, Bldg. Inspectors, Others)
    Defined by sales/mktg personnel at local level (include HOA requirements)

13. Information Request Form: Questions for instructor or company representatives
    Ask questions, any questions,

Product Assembly

1. Energy Ball (V100, V200)

a. Applications (Niche considerations, Residential, Commercial, Governmental)
b. Components Review (What's included, what's not)
c. Tool Requirements (Ratchet/Socket Set, Screwdrivers, Allen Wrenches)
d. Assembly Demonstration (See Installation Manual)
e. Equipment Siting (Avoid turbulence/obstructions, structural integrity)
f. Installation: Standard
    i. Roof Mounts (Components, Assembly Instructions, Hardware, Tools)
    ii. Poles (Components, Assembly Instructions, Hardware, Tools)
    iii. Erection (Manpower, Equipment, Tools)
    iv. Use of Special Tool)
g. Custom/Special Installations (Variables, Discussion, Review)
h. Wiring (Ground Wire Requirements, Box Connections)
i. Inverter Connections
j. Inspection and Testing

2. ***Solar PV***

a. Applications (Niche considerations, Residential, Commercial, Government)
b. Components Review
c. Defining Panel/Power Requirements (Sizing the Installation) (expansion considerations)
d. Tool Requirements
e. Assembly Demonstration (See Installation Manual) (rails, frames, panels)
f. Installation (Site Selection, Bldg. Inspection, Safety, Layout)
g. Wiring (Connecting Panels, Ground Wire Requirements, Continuity Testing)
h. Inverter Connections
i. Inspection and System Testing

3. Solar Heat Tubes

a. By Mercedes (Product Development)
b. Applications (Heating Air/Water)
c. Defining Panel/Power Requirements (Sizing the Installation)
d. Components Review
e. Tool Requirements
f. Assembly Demonstration (See Installation Manual)
g. Installation (Site Selection, Bldg. Inspection, Layout)
h. Plumbing requirements (system integration with existing)
i. Wiring (Controls Requirements)

j. Inspection and Testing

4. Bio-Mass Furnace

a. Applications (Heating Air/Water)
b. Components Review (Read the instructions)
c. System Layout (HVAC Professional)
d. Hot Air/Hot Water Layouts (ducting/plumbing/integration)
e. Assembly Demonstration (See Installation Manual)
f. Fuel Storage
g. Fuel Resources/Costs Fuel Cost Comparison: http://www.pelletheat.org/3/residential/compareFuel.cfm
h. Wiring (Wiring Requirements)
i. System Startup
j. Inspection and Testing

5. Integrated Systems (Wind/Solar/Bio-Mass)

a. Power Requirements (applications)
b. Defining Component Size (Turbine, Quantity of Panels, Number of Heat Tubes)
c. Integrating Systems (HEA Components, Existing Systems)
d. Configuring Controls and Inverter Relationships

6. Collateral Materials

a. PowerPoint Presentations

i. Company
ii. Communications
iii. Products (a, b, c, d)
iv. Installation Manuals
v. Certification

b. Demonstrations

i. Assemble V100
    1. Assemble Flat Roof Mount
    2. Assemble 10 Meter Pole
    3. Installation Discussion
ii. Assemble Solar PV
    1. Rails & Frames
    2. Installation (Roof Attachment, Ground Arrays)
    3. Wiring/Connections/Inverter & Controls
    4. Discussions
iii. Assemble Solar Heat Tube
    1. Rails
    2. Installation
    3. Wiring/Plumbing
    4. Discussions
iv. Walk-thru presentation: Bio-Mass Furnace
    1. Photos and graphics
    2. Layouts, plumbing, ducting, wiring
    3. Controls & Maintenance
    4. Use as component with solar system
    5. Discussions