Pearls of Power Conference – California State University Maritime 2/28/2015

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- M.S. – Mechanical Engineering
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Lake County Resources Initiative (LCRI.org)
Introduction: Pearls of Power

• My “Idiot Coffee Group” understanding of women

• Bad jokes:

• Where to go to Answer professor Storz’s assignment

   LCRI.org has this Power point + two videos

   - Pearls of Power Conference
   - PBS “These Amazing Lands”
   - LCRI TEDX

• A real solution for “Pearls of Power” conference issues!
“Energy Independence and Food Production is the biggest challenge facing the world”

1) Why women can have great opportunities in Renewable Energy

2) Why Renewable Energy is such a good fit with CMA graduates

2) Why Renewable Energy represents a major career field
A real solution for “Pearls of Power” conference issues!

• Define the problem - is not about women it is about community
• If its “all about me” - there is no solution
• The context has to change - to a personal campaign of helping others
• The Shark Tank – Success comes when the enterprise helps community replacing selfish goals
• The Amway refrigerator story
“A Sustainable Energy future is a most pressing issue of the 21st century”

- It is imperative to the health of our land, air, water and communities
- We must move beyond fossil fuels
- The money we spend on energy stays in the U.S.
- We are helping farmers and ranchers
- We heat homes, schools and hospitals with the waste from restoration forestry.
- We create lots of jobs
1) Why women can have great opportunities in Renewable Energy

- Renewables has replaced environment as the major social concern

- Women have compassion that will change the world

- Women have greater insights in design, technology and development

- CMA women have a real advantage due to leadership, character and world perspective that CMA teaches
Our Success in my Community in 5 years: Lake County, Oregon

• We reduced carbon emission to $\frac{1}{2}$ previous
• We reduced our fossil fuel energy use $\frac{1}{2}$ previous
• The money we previously sent to the Mid-East stays in Lake County, Oregon
• We are helping farmers and ranchers
• We heat homes, schools and hospitals
• We generate jet-fuel from forestry restoration.
• We create lots of good jobs
Revitalizing Declining Rural Economies With Renewable Energy

• 15% Unemployment
• Reduced funding for schools, hospital, social services
• High drop out rate, crime, teen pregnancy
• Declining support educational and community services
Lakeview, Oregon Renewable Energy Community Model

• $100 million invested in renewables projects
• 100 new family wage jobs in renewable energy
• Hospitals and schools saving $200,000/ year in energy
• $100,000 per year on renewables taxes
• New open campus learning center

Today, Lake County is on track to becoming Oregon’s 1st “net zero energy” County
2) Why renewable energy is such a good fit with CMA graduates

- Renewable Energy is a **parallel degree** path to CMA programs

**CMA Majors**
- Business Administration
- International Business & Logistics
- Facilities Engineering Technology
- Global Studies and Maritime Affairs
- Marine Engineering Technology
- Marine Transportation
- Mechanical Engineering

- Renewable Energy is a **cross-disciplinary** field
Mission - Provide each student with a college education combining intellectual learning, applied technology, leadership development, and global awareness.
Oregon Institute of Technology Renewable Energy Systems (RES) Degree

- Started in 2005 - 1st Accredited BS Renewable Degree in U.S.
- 0 - 450 students in 1st 4 years – Oregon’s fastest growing program in history
- ½ of the 1st 150 students had BS degrees
- ½ the students had full time jobs and families
Aleena Anderson
Student, Class of 2014
Major(s):
Renewable Energy Systems
Hometown: Selma, Oregon

- The degree is forward thinking and provides education to develop clean energy sources to power our future.

- I want a career that will benefit society, and clean alternative energy sources will do just that!
Oregon Institute of Technology

- OIT Portland, Or.
- OIT Klamath Falls, Or.
- OIT Lake County, Or.
Oregon Institute of Technology

1st “net-zero” energy campus in the U.S.

250 Kilo-Watt Solar Farm

100% Geothermal Heating

Binary Geothermal electrical power production
3) Why Renewable energy represents a major career path for women

Renewable Energy Solves Many Major 21st Century Problems

- Global Warming - President Obama “greatest world problem”
- Energy replacement supersedes environmental issues
- Limited Fuel Supply
- Funding Terrorism
- Water
- World Food Production
- Transportation
U.S. Developed and Manufactured Thin-Film Silicon Solar
- 70 cents per Watt
Evacuated tube space and water heating
Renewable Energy Career Examples - Sustainable Building of the Year - Boise

- Building grey water recovery
- 7 blocks of storm water
- 10,000 gallon storage
- Geothermal Heat
- Ultra-high efficiency HVAC

Buildings use 40% of U.S. Energy
Agriculture Refrigeration
Renewable and Energy Savings

Agricultural refrigeration is often the highest energy consumer in:

- Wineries
- Fisheries
- Cold Stores
- Warehouses
- Dairies
- Supermarkets
- Walk-in Coolers
- Freezers
- Low Temperature Refrigeration
- Cryogenics
- Water Coolers
- Ice Makers
- Food Processing
Power Generation
- Binary Power Plants
  - 200 degree F. Source
  - Waste Heat Recovery (like boiler stacks)
  - Refrigerant Power Cycle
1 KW Electrical power

130 Degree F. Hot Water Heater Source
Power Production – Fuel Cells

- 1.2 KW Ballard Fuel Cell
- Super Conductors 70 Farads
- Carbon Fiber 5000 # tank
- Hydrogen Storage -- 20 minute range
Powered by Ballard Fuel Cell

24 volt DC

1.2 KW Fuel Cell

5 HP DC Motor
Fuel Cell Test Bench
Super Capacitors

Electric Storage

No Batteries
Carbon Fiber Hydrogen Storage
The 80MPG --- 50MPH
9.5 horsepower diesel Hybrid
Hybrid Vehicle Project

1971 Datsun Junkyard Dog
• 70 MPG
• 50 MPH
• 9.5 HP Air Cooled Diesel
Battery Storage   8X12 V = 96 Volt
Structural Modification?
20 HP Electric Motor Drive and VW Transmission
Electric Cars
Gem Cars - Chrysler
40 mile range
35 MPH street
$8K
Corbin Sparrow

- 75 MPH
- 40 mile range
- $16K
Oregon Tech Students Programmed and Installed all Control and Data Acquisition Equipment
• 5 KW PV Solar
• Ground Source Heat Pumps
• Evacuated Tube Solar Hot Water
Vegetative Roof - Cannon Beach
Renewable Energy Automation Integration and Embedded Systems
Bob Rogers House - Dairy Creek Lane Lane Lakeview
15 – 230 Watt Panels
Solar PV Power Inverter
Why we live in Lakeview,
Conclusion – So… What about Bob – What am I going to do?

1) walk-the-walk and build community
or
2) Drink beer

Anyone want to go to Qua Qua South Africa
October 8, 2015?
We hope to ship solar water tubes systems from China to install in 300 huts

- I worked with a church in Lakeview to develop 20 solar water heaters in poorest homes
- Fed-Ex Ocean - I learned to ship containers anywhere
- Church of Glory – Qua Qua, South Africa
- We propose to ship solar water tubes from China to install in 300 huts – Installed cost $500 with shipping
- We propose to train Village members to install and service (30% unemployment)
- We propose to develop local factory to build components ($ for schools, hospitals)

Anyone want to go to South Africa October 8, 2015?
Do it for Sophie
The energy solution is in our hands.....