

**CERET's Renewable  
Energy Technology  
Certificate and Train the  
Trainer Academies**

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# CERET

Consortium for Education in Renewable Energy Technology



## Mission Statement—

Increasing the availability and use of renewable energy through a world-class Consortium for Education in Renewable Energy Technologies

## Certificate

= Online

Face-to-Face =

Course Number	Course Title	Credits	Hours / Week Lecture—Lab
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Choose at least one of the following classes

10-468-100	Solar & other Renewable Energy Systems	4	4-0
10-468-110	Energy Management	4	4-0

Total

At  
Least 4  
credits

Plus at least 3 credits from among these classes

10-468-120	Alternative Fuel and Electric Vehicles	3	3-0
10-468-130	Photovoltaic Design	2	2-0
10-468-134	Advanced Photovoltaics	2	2-0
10-468-140	Sustainable Home Design	2	2-0

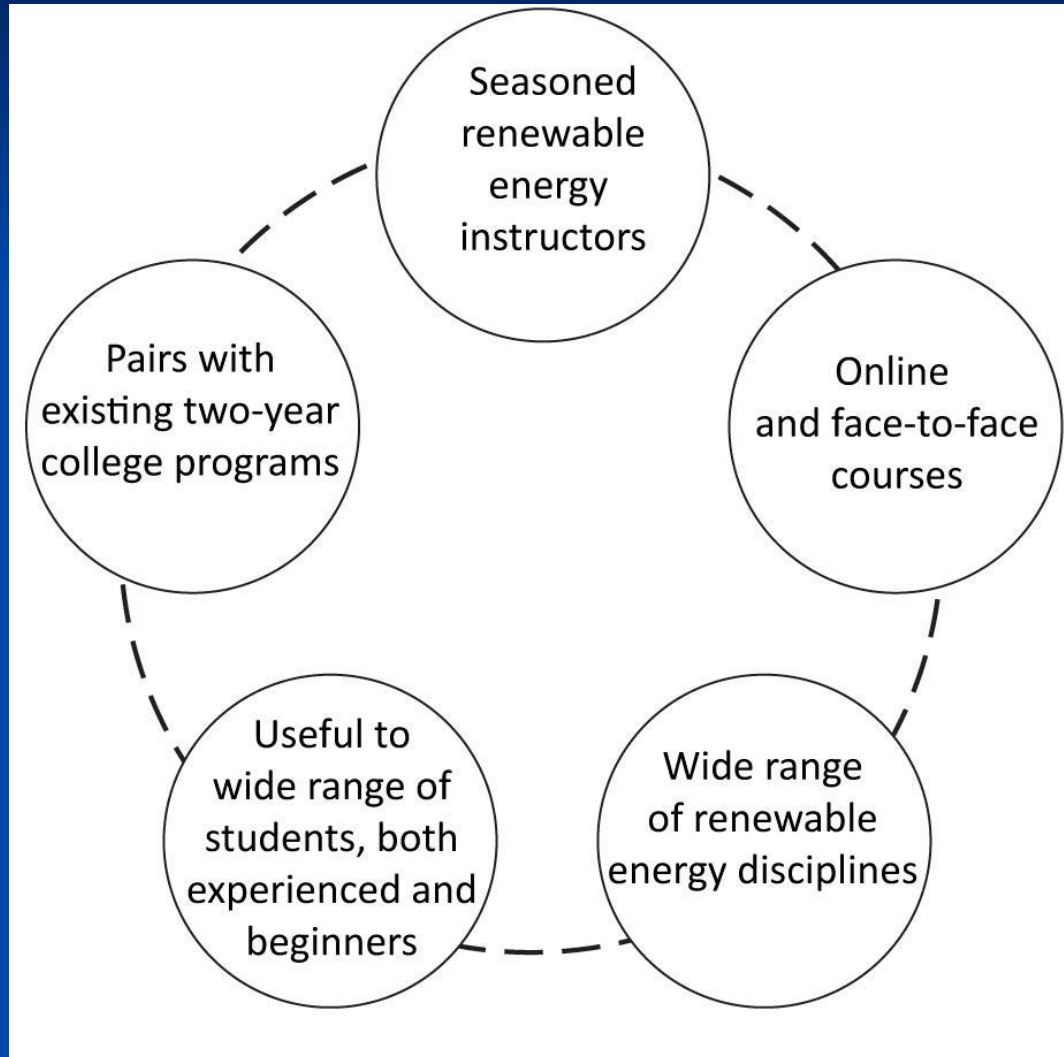


## Resources

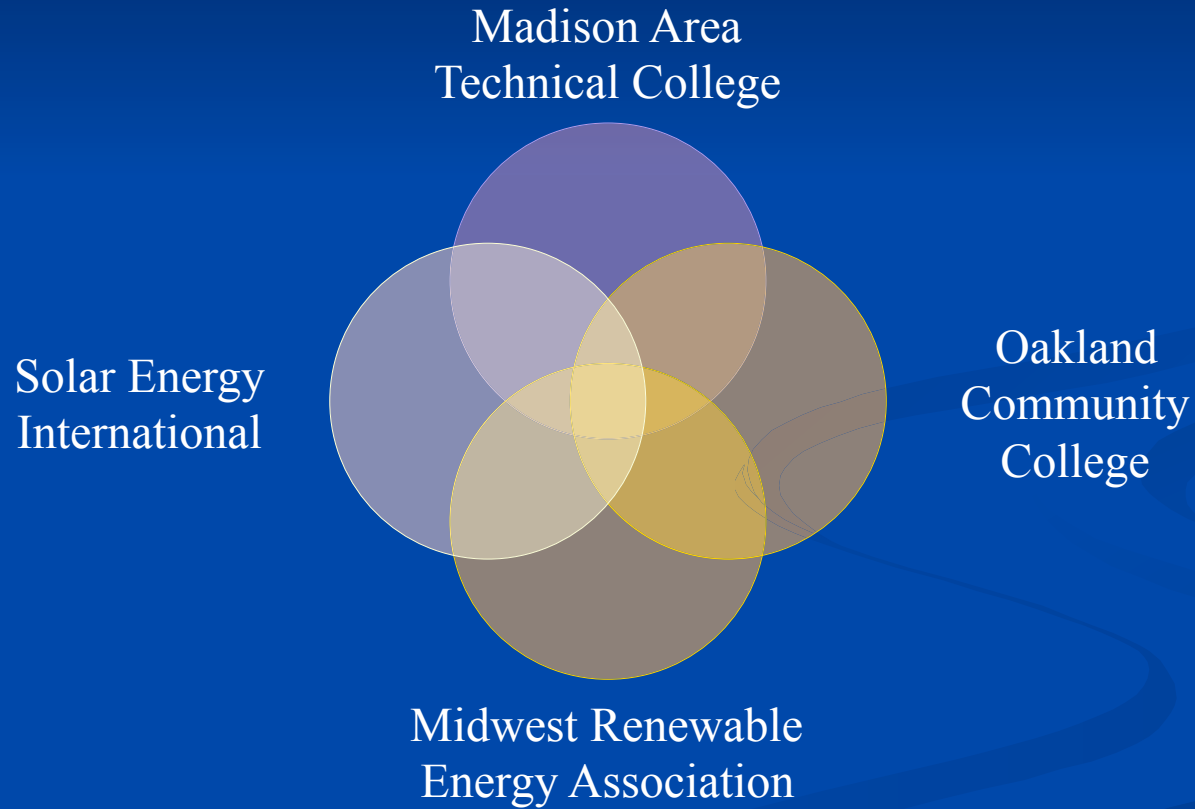
CERET Resolution

CERET Workshop

# CERET Model



# CERET Partners



# CERET Certificate

## Online/Hybrid courses

- 10-480-100 Solar & Other Renewable Energy Systems 4
  - 10-481-110 Energy Management 4
  - 20-623-290 Renewable Energy for Internatl. Develop. 3
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- 10-482-130 Solar Electric Fundamentals 2
  - 10-482-134 Grid-Direct Solar Electric Systems 2
  - 10-482-136 Battery-Based Design 2
  - 10-484-160 Introduction to Biomass Energy 3
  - 10-484-163 Introduction to Biofuels 2



# CERET Certificate

## Face-to-face courses

- 10-468-121 Introduction to Ethanol Fuel 1
- 10-468-130 Introduction to Biodiesel Fuel 1
- 10-482-100 PV Design and Installation 2
- 10-468-131 Basic Photovoltaics and Site Assessment 1
- 10-468-132 Intermediate Photovoltaics 1
- 10-468-133 Advanced Photovoltaics Installation 1
- 10-468-141 Solar Domestic Hot Water/Site Assess. 1
- 10-468-151 Wind Site Assessor Training 1
- 10-468-152 Wind Systems Repair/Maintenance 2
- 10-468-153 Wind Systems Installation 2
- 10-468-161 Anaerobic Digester Technology 1
- 10-468-162 Wood Combustion Heating Systems 1

# Programs that pair with renewable energy

Electrical Engineering Tech  
Industrial Maintenance

Agriscience/business

Architecture Tech

Automotive

Biotechnology

Construction and Remodeling

Civil Engineering Tech

Diesel Equipment

Electrical Apprentice

Electronics

# CERET Model

- Allows for specialization in renewable energy within the security of existing job categories
- Provides professional development opportunities for instructors
- Provides access to updated curricula in energy efficiency and renewable energy instruction



# CERET Indicators

- Offered courses for the last 6 years
- Largest certificate that Madison College has offered
- 525 students have signed up for the certificate
- Students come from almost every state as well as Canada, Estonia, South Africa, Israel
- A total of 37 students have completed the certificate

# Transition to new certificates

In the Fall of 2012, CERET will be transitioning to three new certificates:

BioEnergy

Photovoltaics

Wind Energy

New Grant: NSF/DUE 1205015

# New Certificate: BioEnergy

## Pre-Requisites

Electricity for Renewable Energy	3Cr	Fall 2012
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## A minimum of 6 credits from these Core RE Courses

Intro to Renewable Energy	Online	3Cr	Summer 2013
Energy Management & Economics		3Cr	Spring 2013
Intro to Biomass Energy	Online	3Cr	Spring 2013

NOTE: Core courses are not prerequisites for the courses below

## Plus additional credits to reach a total of 15 Credits

RE for International Development	3Cr	Winter 2012	
Intro to Biofuels	Online	2Cr	Fall 2012
Anaerobic Digestion and RNG	1Cr	Fall 2012	
Nutrient Management and Recycling	1Cr	Fall 2012	
Intro to Biodiesel	1Cr	Spring 2013	
Intro to Ethanol Fuel	1Cr	Spring 2013	

# New Certificate: Photovoltaics

## Pre-Requisites

Electricity for Renewable Energy      3Cr      Fall 2012

## Required 8 credits from these Core RE Courses

Intro to Renewable Energy Online	3 Cr	Summer 2013
Energy Management & Economics	3Cr	Spring 2013
Intro to Photovoltaics	2Cr	Fall 2013

## Plus an additional 7 credits from these courses

RE for International Development	3Cr	Winter 2012
Grid Connected PV Design and Install	2Cr	TBA
Advanced PV Design and Installation	2Cr	TBA
Advanced NEC Code Compliance	2Cr	TBA
Commercial and Utility Scale PV	2Cr	TBA
Off-Grid and Battery Based Systems	2Cr	TBA
Solar Site Assessment	1Cr	TBA
PV Contracting and Technical Sales	2CR	TBA

# New Certificate: Wind

## Pre-Requisites

Electricity for Renewable Energy	3Cr	Fall 2012
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## Required 8 credits from these Core RE Courses

Intro to Renewable Energy    Online	3Cr	Summer 2013
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Energy Management & Economics	3Cr	Spring 2013
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Intro to Wind	2Cr	Fall 2012
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## Plus an additional 7credits from these courses

Wind Systems Tech 1	2Cr	Spring 2013
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RE for International Development Hybrid	3Cr	Winter 2012
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Wind Turbine Installation	1-2 Cr	Spring 2013
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Wind Turbine Maintenance and Repair	2Cr	Spring 2014
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Wind Turbine Design and Fabrication	3Cr	Fall 2013
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Wind Site Assessment	1Cr	Fall 2012
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# RE Train the Trainer Academies



**June – Biofuels  
Madison, WI**

- Stipends provided
- Graduate credit available thru KEEP/UWSP
- Emphasize hands-on experience
- Instructors from MREA, SEI, & NAFTC
- Summer academies meet teacher schedules

**July – Solar Electric  
Paonia, CO**



**Solar Energy International**  
renewable energy education for a sustainable future

# Train the Trainers 2012

## Biofuels – Lexington, Kentucky

10♀, 14♂

2 MS, 5 HS, 7 two-year

CO, FL(2), IL(2), KY(13), MI, NY, VA, WI  
(3)

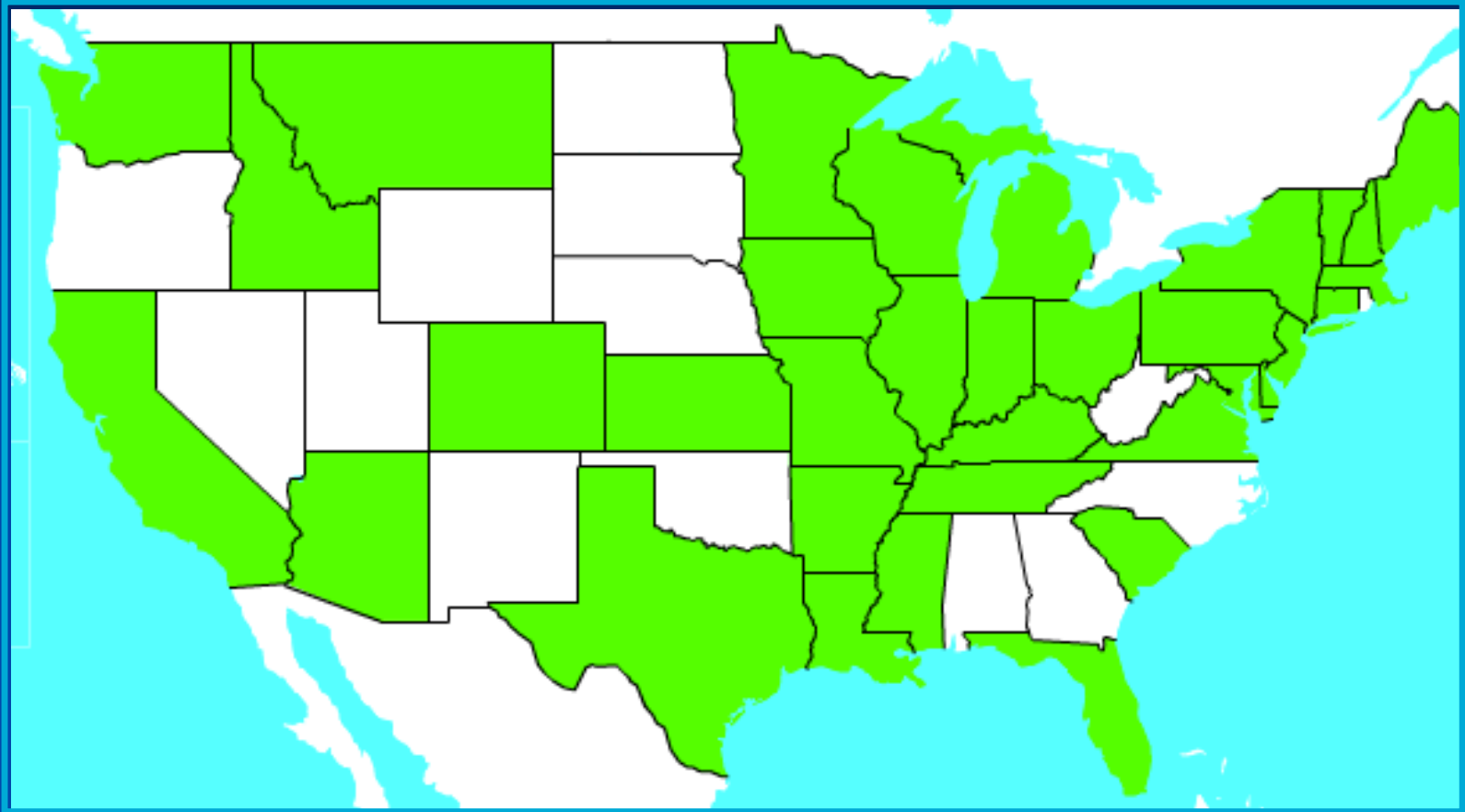
## Photovoltaics – Paonia, Colorado

5♀, 20♂

9 HS, 16 two-year

CO (2), CT, DE, ID, IL, IN, MD, MI(2), MN  
(2), MS, MT, NH(2), OH, SC (2), TX, VA,  
VT(2), WA, WI (4)

# Train the Trainer participants



Over the past three years, we have served 101 teachers in the Train the Trainer Academies.

# Biofuels Train the Trainer Curriculum at a Glance

- Produce 50 gal of biodiesel using a small pilot reactor
- Perform ASTM QA/QC tests on various fuel samples
- Measure engine horsepower, torque, and emissions running on petroleum and biofuels
- Guest lectures from Office of Energy Independence and WI Small Scale Biofuels Producer Program
- Tour of Badger State Ethanol Refinery
- Teacher Show and Tell Sharing Sessions







# PV Train the Trainer Curriculum at a Glance

- Based on SEI's PV Lab Week workshop
- Install roof, pole, or ground mount PV panels
- Wire inverters, disconnects, and AC service panels
- Install and operate PV monitoring equipment
- Inspect and troubleshoot systems for NEC code compliance
- Teacher Show and Tell Sharing Sessions







# Train the Trainer Testimonials

- Excellent opportunity. I hope other instructors from my school can come next year
- Great diversity of participants – school levels, disciplines, and geography
- Excellent Hands-On!
- Great Facilities and Beautiful Surroundings!
- This was the most fun and informative training opportunities that I have ever attended 😊
- Now I can safely expand what we are doing at my school with biodiesel
- I am looking forward to trying some of these solar activities with my students back home



*For More Information on the  
Consortium for Education in  
Renewable Energy Technology  
(CERET) :*

**[www.ceret.us](http://www.ceret.us)**

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