



# New Energy    New Jobs

## New Opportunities for Appalachia ARC Fall Conference 2009

Allan M. Gentry  
Energy Efficient Residential Construction Program  
Cleveland State Community College



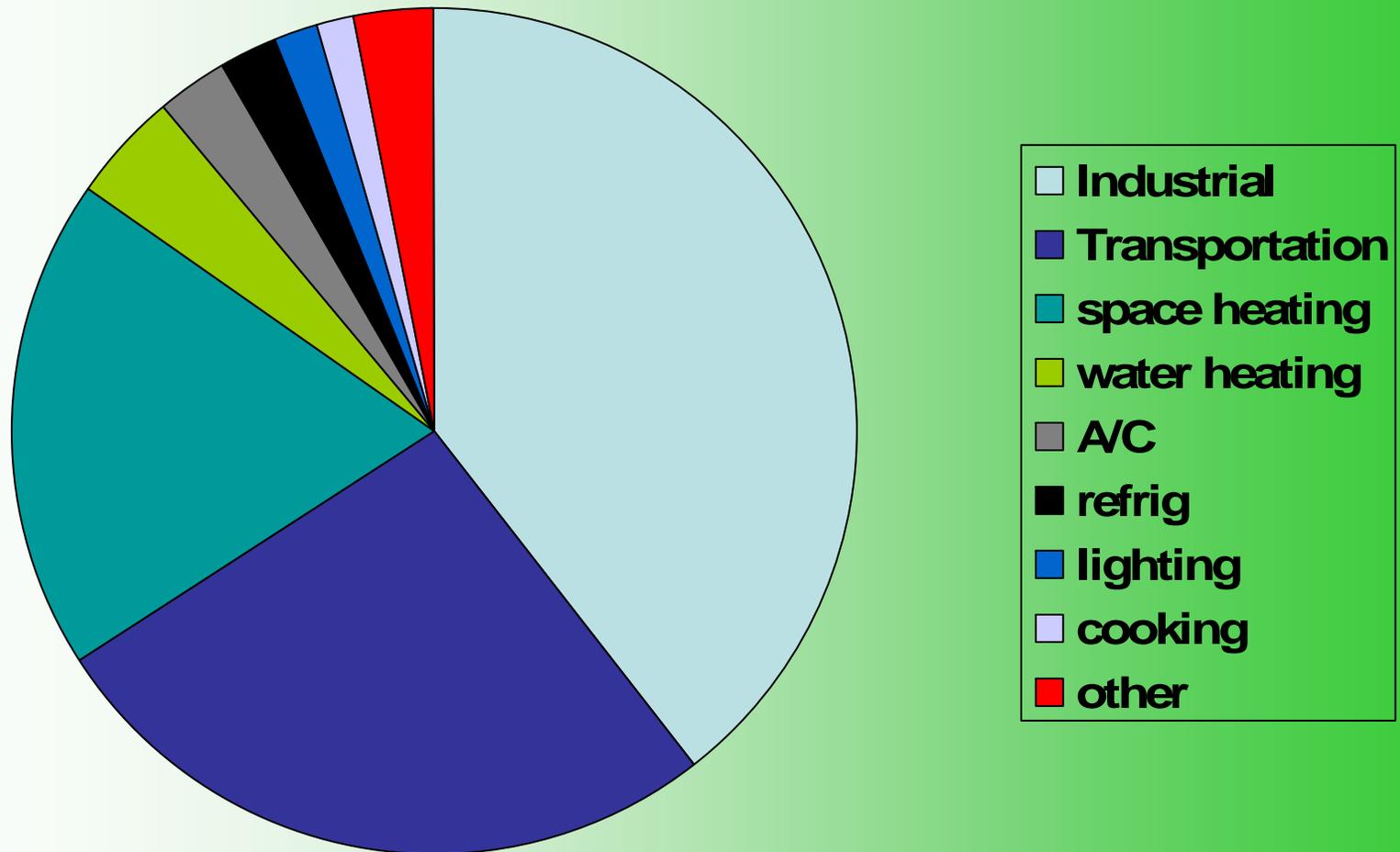
Supported by:  
USDOL Grant **CB-15212-06-60**

ARC Grant **CO-16106-08**

# Reason for Change

- America - 30% of the world's energy
- Projected to increase
- Appliances, HVAC, water heaters, consume 90%
- Dependence on foreign oil; oil more expensive to extract
- Tennessee homes – rank #1 in electrical consumption; close race with Alabama - 1,240 kwh/month, compared to national average of 850 kwh

# National Energy Use



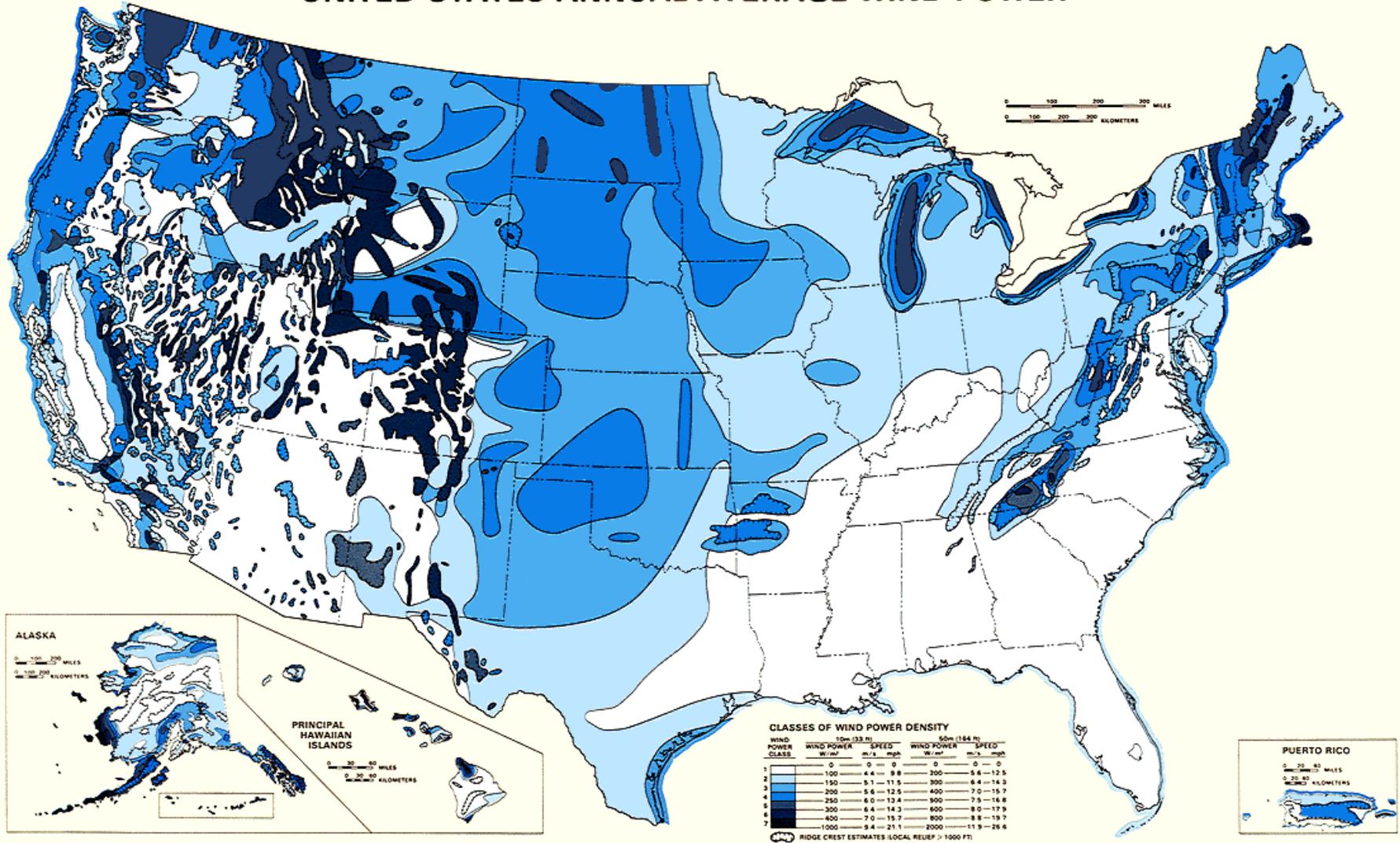
# Renewable Energy Options

- Solar electric
- Solar thermal
- Wind
- Hydroelectric
- Biomass
- Geothermal
- Ocean wave / currents
- Ocean tidal
- Conservation

# Considerations

- Maturity
- Availability
- Reliability
- Maintainability
- Environmental
- Economic

# UNITED STATES ANNUAL AVERAGE WIND POWER



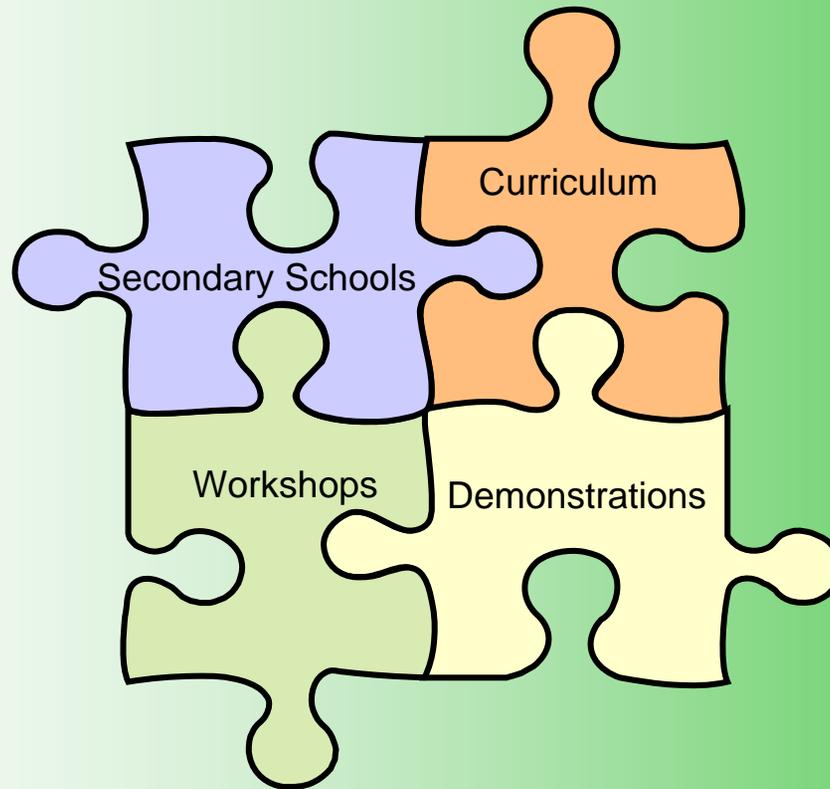
# Options

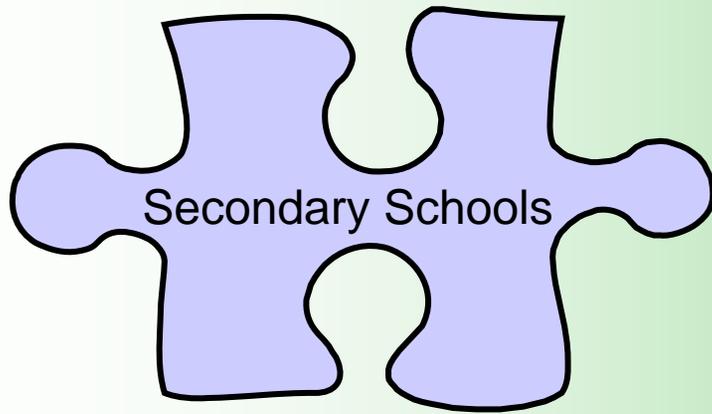
	Maturity	Availability	Reliability	Maintain	Environment	Economic
Solar electric	M	M	M	H	L	H
Solar thermal	H	M	M	H	L	M
Wind	M	L	M	M	M	H
Hydro	H	M	M	H	M	M
Wave	L	L	L	L	L	H
Tides	L	L	L	L	L	H
Biomass	M	H	H	M	M	M
Geo - thermal	M	H	H	M	M	M
Efficiency	H	H	H	H	M	M

# Knowledge, Skills, & Abilities

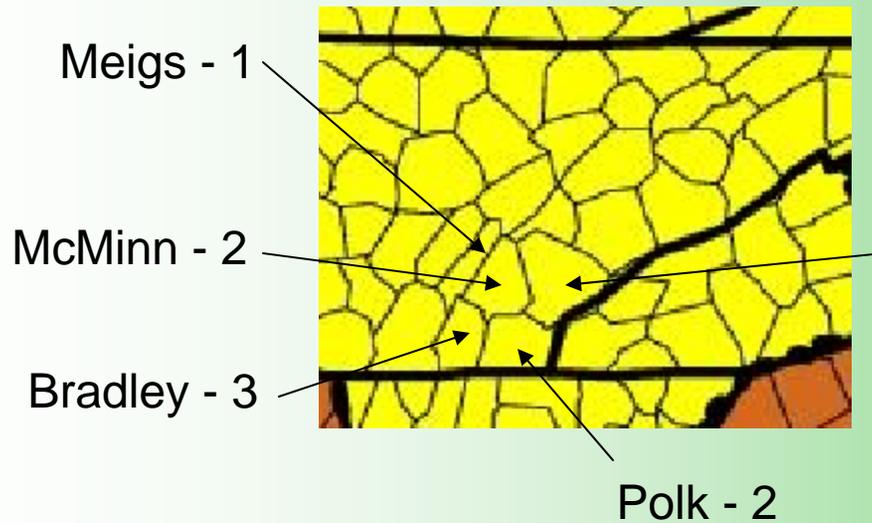
	Electric	Mechanical	Structural	Process	Math	Technology
Solar electric	X		X	X	X	X
Solar thermal		X	X	X	X	X
Wind	X	X	X		X	X
Hydro	X	X	X		X	X
Wave	X	X	X	X	X	X
Tides	X	X	X	X	X	X
Biomass	X	X	X	X	X	X
Geo - thermal	X	X	X	X	X	X
Efficiency	X	X	X	X	X	X

# "Zero Energy Homes" Model





- 11 High Schools
- 1 TN Technology Ctr.
- 5 county service area
- Programs and Demonstrations
- Recruiting
- Scholarships

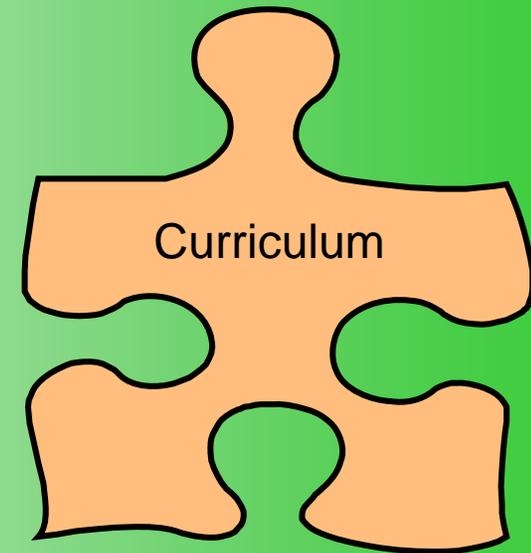


Monroe - 3

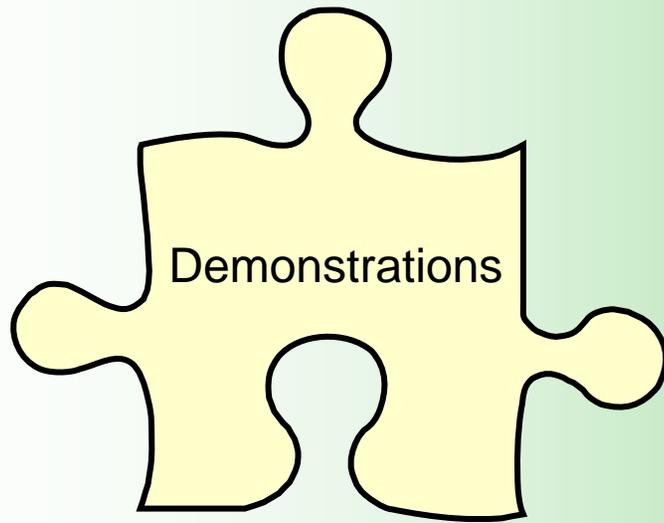


# Construction Technology

- New Courses – ZEH Concept
  - Renewable Energy
  - Energy Efficient Construction
  - Geothermal heat pump
  - HERS Rater Training
  - PV Panel Installation
  - Service Learning – HFH
- Certifications
  - PV Installer
  - HERS Rater
  - Green Builder – coming
- Award of Achievement
- 1 year Certificate
- 2 year AAS
- 2+2 w/ UTC BS Const Mgmt



- Core
- Industry Specific
- Specialization
- Credit
- Non-Credit
- Integration



Solar PV Installation / Utility Inter-tie

Web based data collection and display

VAWT Installation

Habitat Energy Star Houses

Blower Door / Duct Blaster

Dedicated Classroom/Lab

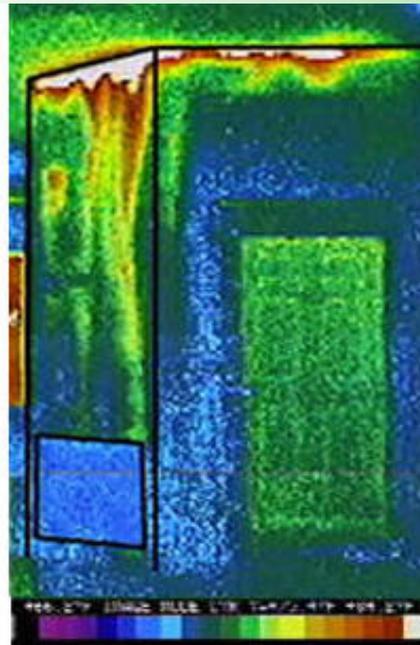
Ground Source HVAC

Models and Samples

Thermography

Mobile Technology

Hands On Application





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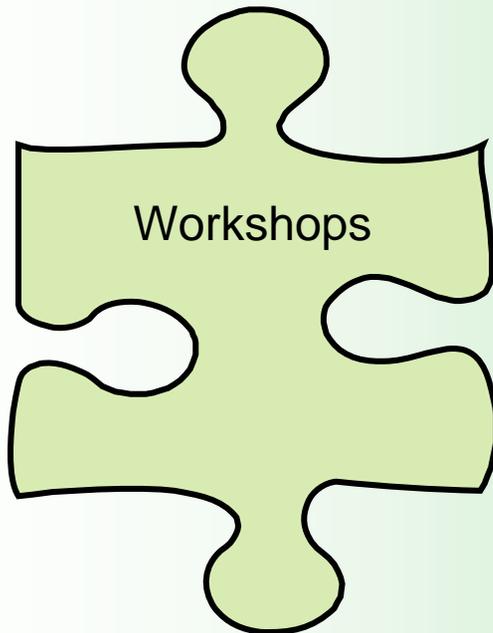


AUG 13 2009





- Builders
- Contractors
- Subcontractors
- Suppliers
- Utilities
- Homeowners
- Bankers
- Realtors
- Civic / Non Profits



- Inform
- Educate
- Promote
- Recruit
- Challenge

# Results

- >200 Students Enrolled
  - >100 in ZEH
- > 500 Courses Completed
- >17,000 Workshop / Conference Contacts



2008 Energy Leadership



**2009 USGBC Excellence  
in Green Building  
Education Award**

# Job Opportunities

- 17 -18,000 new green collar jobs in TN (REPP) – wind, solar, geothermal, biomass
- Energy Efficient Construction
- UT Bioenergy programs – 4000 new jobs and 3000 satellite jobs
- Third party analysis and verification
- ARRA Home Weatherization
- Utility sponsored programs

# Top 10 Reasons To “Think ZEH”

- Fits faith values
- Environmental preservation
- Saves money
- Energy security– national & personal
- Status symbol
- Hobby/ fun
- Enhance visibility/ marketing
- Home improvement
- Utility value – adds space, shading, etc.
- Get a good deal – utilize incentives

# Questions



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