Green Energy: How will it shape Rural American Communities? With Ohio Economic Update

Presented at

Ohio Chapter of the American Society of Farm Managers and Rural Appraisers

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www.aede.osu.edu/programs/swank

Swank Program in Rural-Urban Policy

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For more details of the decline of Alternative Energy, see Krauss, Clifford, "Alternative Energy Suddenly Faces Headwinds." New York Times, October, 20, 2008 http://www.nytimes.com/2008/10/21/business/21energy.html?em

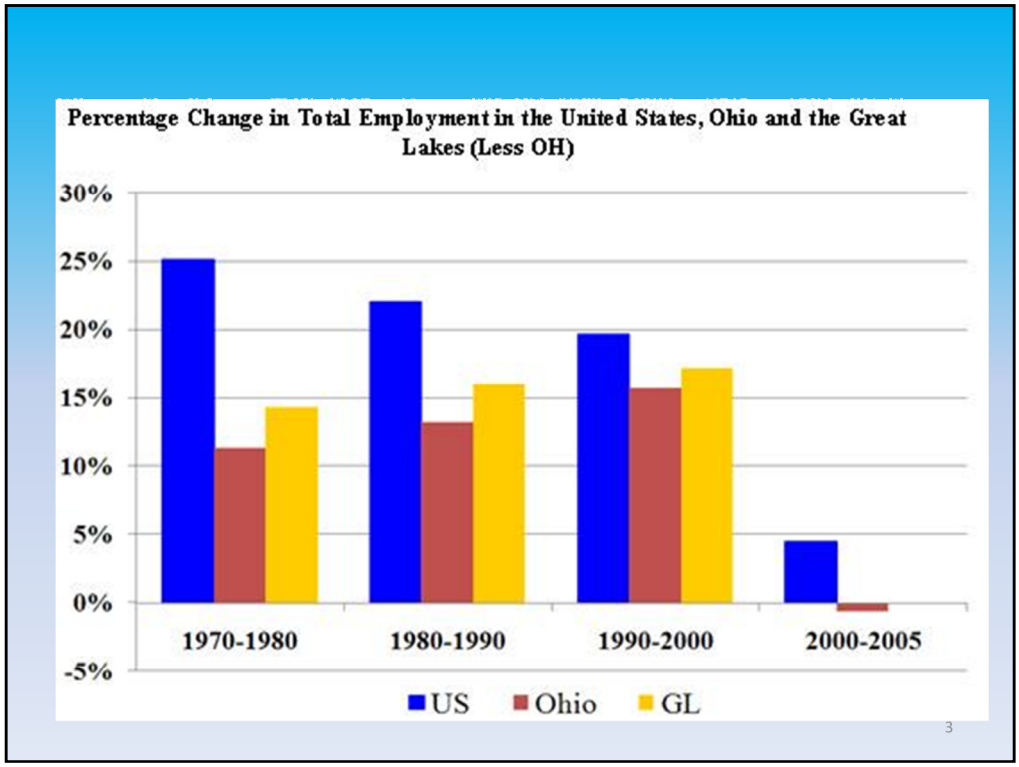
1. Thanks
2. Economist

More details can be found in the paper: "Dissension in the Countryside: Bridging the Rural-Urban Divide with a New Rural Policy" co-authored with Rose Olfert. The paper can be found at my web site at Ohio State. The chapter will soon be published as part of an edited volume by the University of Seoul press. Much of this includes background for those who have not thought about place-based policy.

We thank many comments of readers without any attribution including Jill Clark, Christine Gosselin, Robert Greenwood, Maureen Kilkenny, and Darrel Pack. We also thank Infrastructure Canada for their support in funding part of this research under a grant entitled: "Mapping the Rural-Urban Interface: Partnerships for Sustainable Infrastructure Development." We also thank the Canada Rural Revitalization Foundation and the Federation of Canadian Municipalities for their support in this project, in particular Robert Greenwood.

First—update on Ohio Growth and the current crisis.

- Even w/o a crisis, Ohio faces systemic problems
- Ohio's economy has lagged the nation for decades.
- Who cares—old news… **BUT Important!**
  - If Ohio returned to the national average in per-capita income: $13,000+ more income for a family of 4.
  - 60,000 more jobs a year if Ohio's job growth equaled the U.S. rate in 2000-07.
  - Private sector investment does not occur with current expectations.
    - Vicious cycle that limits wealth creation.



OH compared to U.S. and our Great Lake State peers (Rust Belt). Great Lake States all have a manufacturing history, settlement history and weather that drives Sunbelt migration. So doing worse than them is particularly alarming for Ohio's future.

Update on national/Ohio economic crisis

- One near term problem is state and local budgets are billions out balance going forward (Ohio has been prudent).
  - Bad: very little money to currently work on long-term fixes such as K-12 or infrastructure.
  - Good: this is the time to eliminate 'bad' programs—i.e., 'across the board' cuts are not serving the interest of Ohioans.

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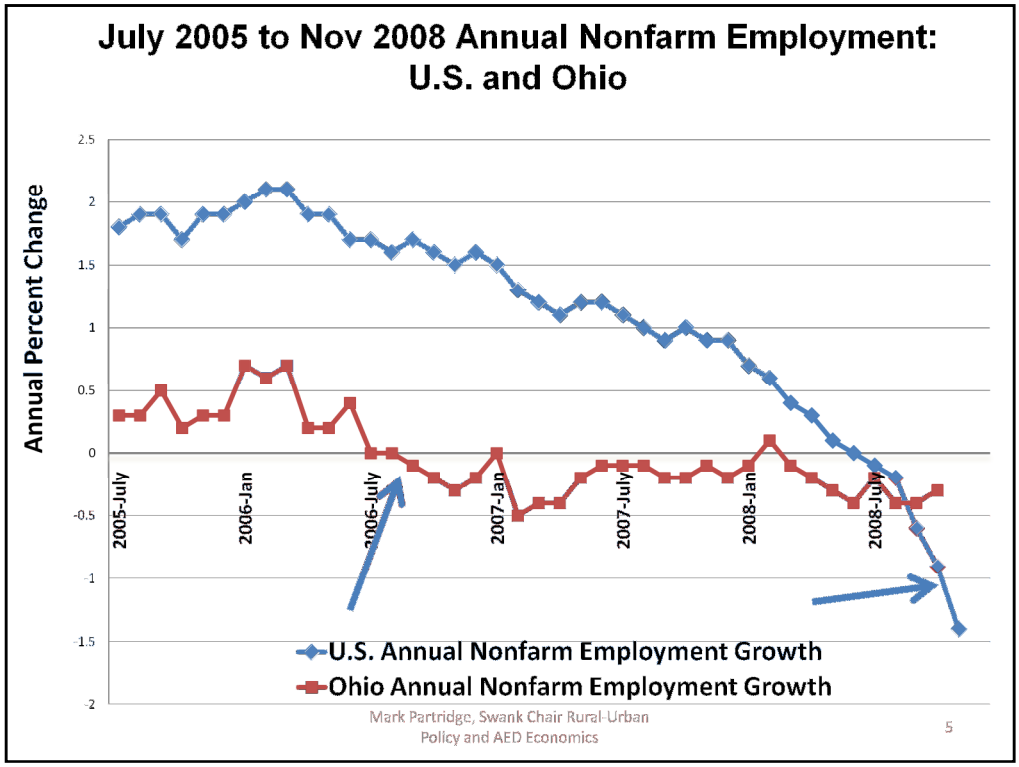

Source, U.S. Dept. of Labor, www.bls.gov

U.S. is now worse than oil—housing market and other bubbles less here.

Current Ohio Conditions

- Employment data suggests Ohio may have entered recession in late 2006.
  - Felt like a recession to me in Ohio.
  - Actually Ohio may not be as worse off as the nation due to a smaller real estate bubble and less financial speculation.
    - Though manufacturing represents a drag—not a huge drag.
    - Ohio's 'problem' is not that (say) the domestic auto industry is going down the drain (or whatever).
      - Creative destruction makes more productive market economy
      - Ohio's problem is not letting go of declining industries and finding new ones—relative to the rest of the U.S. We prefer 'bailouts'

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Federal and State Policy

- The state's $1.6 billion 5-year stimulus package is a tiny share of the Ohio economy (about 0.06% of GDP per year).
  - Its impact will be imperceptible at most—press releases notwithstanding.
- Federal stimulus package may have a small positive impact in the short run and may be larger in the long term if it is well spent.

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Motivation for the bio-economy talk

- My underlying commitment (passion) is for strong rural American communities that are prosperous and have a high quality of life.
  - But I provide advice as an Economist—we don't pander and we aren't cheerleaders.
- What reflects prosperous communities:
  - Job growth is key
  - Clean environment and high quality of life
  - Rural development experts are mainly interested in industries as far as they contribute to these goals.

Motivation

- Later, I will focus on how biofuels and the broader "Green Economy" will affect the prosperity of rural America and its communities.
  - Need to understand what a sustainable green energy economy would look like.
    - To really compete with the fossil-fuel economy, it must compete with fossil-fuels in terms of cost effectiveness.
    - It has to compete with fossil fuels or our standard of living will decline and all Americans will be worse off.
    - **More details can be found in my Dean's outlook presentation on Oct. 27, 2008, *www.aede.osu.edu/programs/swank.***

Motivation

- Once we understand the underlying economic fundamentals, we can draw clear conclusions on numbers of jobs and effectiveness.
- Going forward, I will:
  - Discuss what politicians say
  - Discuss the economics of fossil fuels—and conclude what a healthy green economy means
  - Discuss green energy's impact on rural economies

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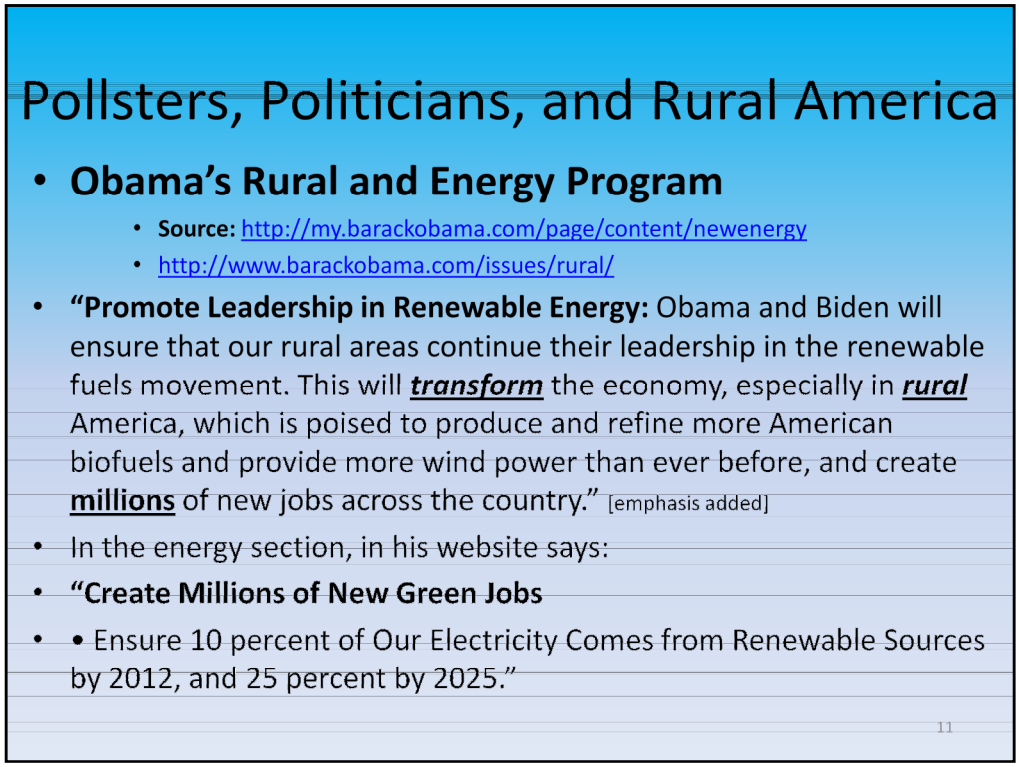

Also, see Krauss, C. NYT article referenced in the notes to Slide 1.
Sourse BEA: 2007 motor vehicles, bodies and trailers, and parts manufacturing employment= 995,700.

Motor vehicle and parts dealers is irrelevant, but that is 2,156,900 for 2007. mostly auto sales people.

Let's evaluate if a Green Economy and Biofuels can deliver such promises

- Alternative Green energy has tremendous advantages: less carbon, replace fossil fuels, limit dependence on foreign sources. **This strikes me as very worthwhile.**
- **But what do we want, A or B:**
- A. **Efficient 21st Century Green Energy** that helps the environment and maintains U.S. competitiveness.
- B. **A bloated Soviet Jobs Program** aimed to provide goodies to entrenched special interests.
  - Such a program will hurt our competitiveness, not help the environment, and we will eventually have to pull the plug on it—*á la* Oil Shale of the late 1970s.

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No free lunch

Fossil Fuels: Coal-based Electricity

- We need an assessment of fossil fuel productivity to grasp what is needed for Green energy.
- Whatever the source, we will have some sort of distribution network. So, I will focus on the base source.
- Montana & Wyoming Coal Mining—why, these are **rural** areas and I grew up in that region.
  - It makes my main point.
- Then compare this briefly to wind turbines and ethanol.

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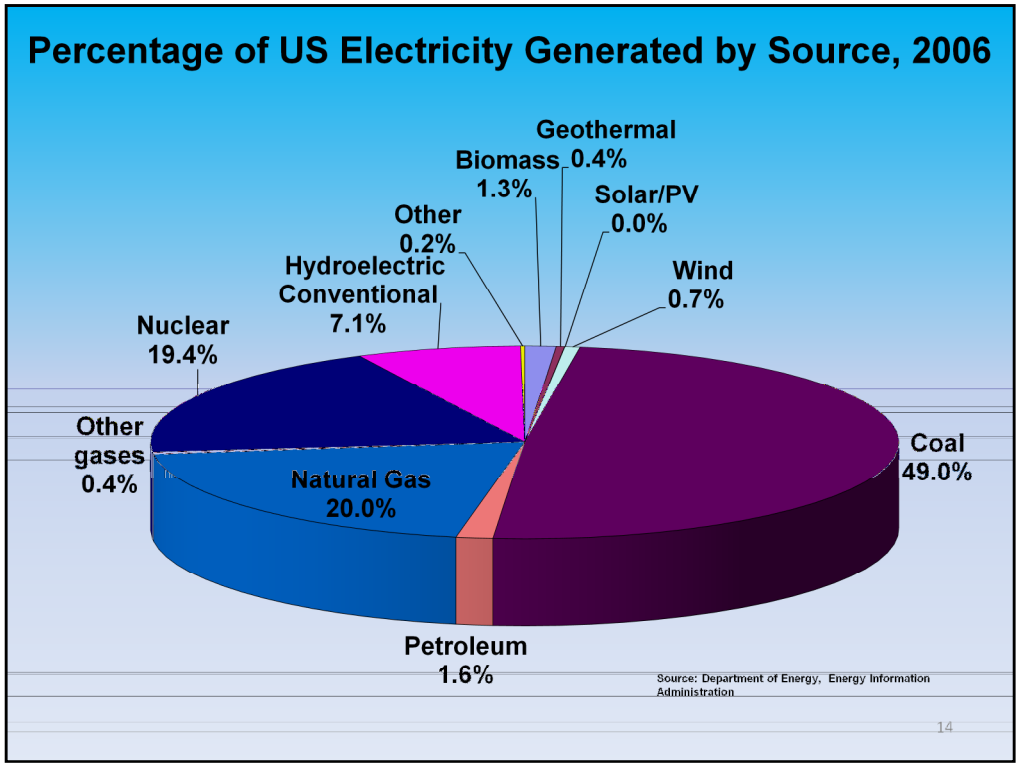
Percentage of US Electricity Generated by Source, 2006
Geothermal 0.4%
Biomass 1.3%
Solar/PV 0.0%
Other 0.2%
Wind 0.7%
Hydroelectric Conventional 7.1%
Nuclear 19.4%
Other gases 0.4%
Natural Gas 20.0%
Coal 49.0%
Petroleum 1.6%
Source: Department of Energy, Energy Information Administration
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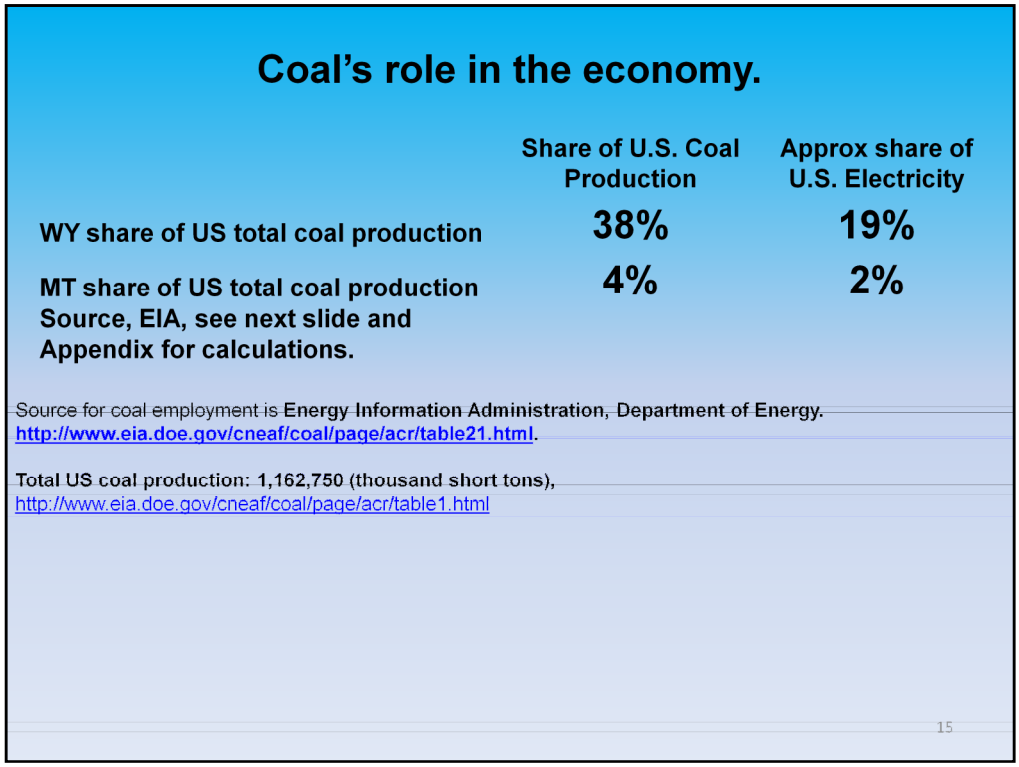

See Appendix table for calculation.

Coal's role in the economy—cont.

	#Employees in coal 2006*	Total State employees 2006	% total that are in coal mining
Montana	942	630,288	0.15%
Wyoming	5,837	375,047	1.56%
U.S.	82,959	177,815,600	0.05%

*Includes all employees engaged in production, preparation, processing, development, maintenance, repair shop, or yard work at mining operations, including office workers,
Source: Energy Information Administration http://www.eia.doe.gov (including energy production)
http://www.eia.doe.gov/cneaf/coal/page/acr/table21.html
Total state and U.S. employment is from the U.S. Bureau of Economic Analysis.

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Fossil Fuels vs. Green Energy

- Only, 6,800 coal miners produce coal that supplies 21% of U.S. electricity!
  - A key reason that we are 'addicted' to fossil fuels is that we are so remarkably productive at it.
- Green energy needs to be at least 'nearly' as productive to be sustainable.
    - We cut it slack if it is 'clean'—i.e., properly pricing carbon.
  - But, the numbers of jobs should be thought of in the tens of thousands, not the millions.
  - We need a green-energy sector that employs few workers, not one that employs 'millions' of workers. The latter is not sustainable.

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Sustainable Green Energy needs

- **A punch line of this talk is that green energy cannot be nor should it be some sort of a major jobs creator if it is to be sustainable.**
- Those who claim otherwise have not thought through what a 21st Century Green Economy would have to be to be competitive.
- **A national energy policy is not the same as good local economic development policy!**

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Wind energy

- **Efficient** wind energy is good energy policy, but I am not even sure if *inefficient* wind energy would create large numbers of jobs.
- Why?
- We have had a similar capital-intensive technology—e.g., cell phones. (another good idea)
  - But after the constructions of scores of cell towers, what has been the employment effects of cell towers. Well, not much—its too capital intensive
- Why wouldn't the same apply for wind turbines if it is capital intensive?

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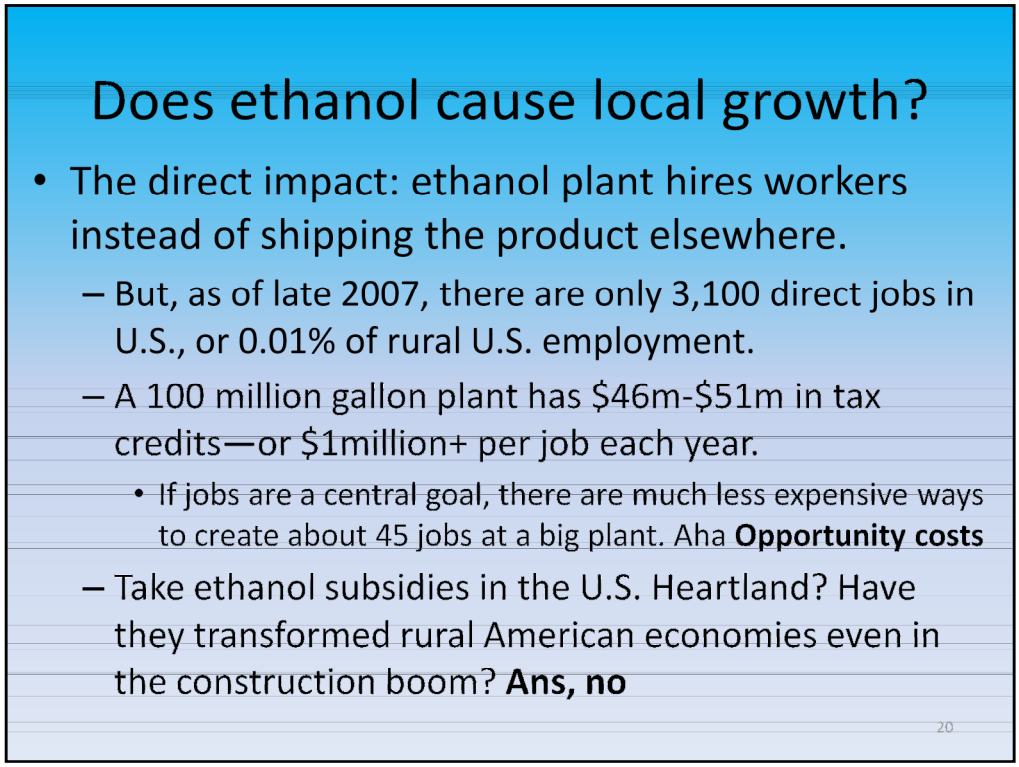


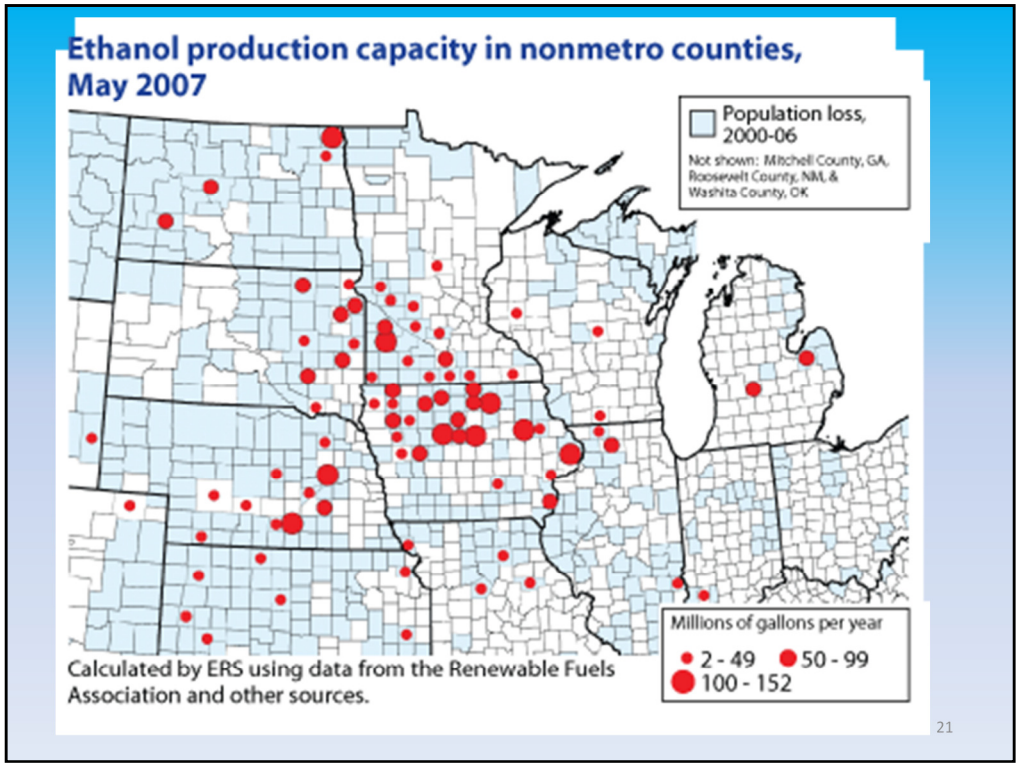
Rural=nonmetropolitan in this discussion.

Ethanol boom is busting as few new plants are being constructed:

See: "Ethanol Is Dream Deferred for Farming Towns Too Late to Biofuel"

http://www.bloomberg.com/apps/news?pid=email_en&refer=home&sid=azPOyrCia8Nc. Sept 12. 2008.

Other sources are on the next slide.



Source, USDA, ERS, *Rural America at a Glance, 2007 Edition.* Available at: http://www.ers.usda.gov/publications/eib31/eib31.htm (downloaded, Feb 20, 2008).

Opportunity costs of subsidies, $46 million for a 100 million gallon plant per year?

"Direct employment in the plants is not large, typically averaging about 35 jobs per plant. The 88 nonmetro plants employ about 3,100 workers. Seventy percent of the nonmetro ethanol plants in operation are located in counties that declined in population from 2000 to 2006, whereas just half of all nonmetro counties lost population. Of new ethanol plants under construction, nearly four-fifths (67) are in nonmetro counties and 75 percent of these are in counties with declining population. (In economic development, weigh the opportunity cost of the subsidy vs. other things that could be done in rural America. Is this a net gain?)." From Rural America at a Glance.

Of 26 million jobs, 3,100 nonmetro jobs represents 0.01% of total rural employment.

For work of Caution on Ethanol, see…..

For more details of how ethanol affects the Iowa economy, see David Swensen, *The Economic Impact of Ethanol Production in Iowa* is available at: http://ideas.repec.org/p/isu/genres/12865.html

Here is the associated press release: from SSTI, 5015 Pine Creek Drive, Westerville, Ohio 43081
Phone: (614) 901-1690 http://www.ssti.org

Iowa Researcher Finds Limits to the Economic Impact of Ethanol
In recent years, Iowa, like many midwestern states, has experienced a boom in ethanol production. Iowa's natural competitive advantage in growing and processing corn has helped it to move to the forefront of the emerging biofuels industry. The state provides numerous incentives and assistance programs through its Department of Natural Resources to help spur the creation of ethanol-related companies and jobs. A new report by Iowa State University economist David Swenson, however, argues that even if these programs are successful at building a strong ethanol industry, the overall economic impact of this success would be smaller than predicted.

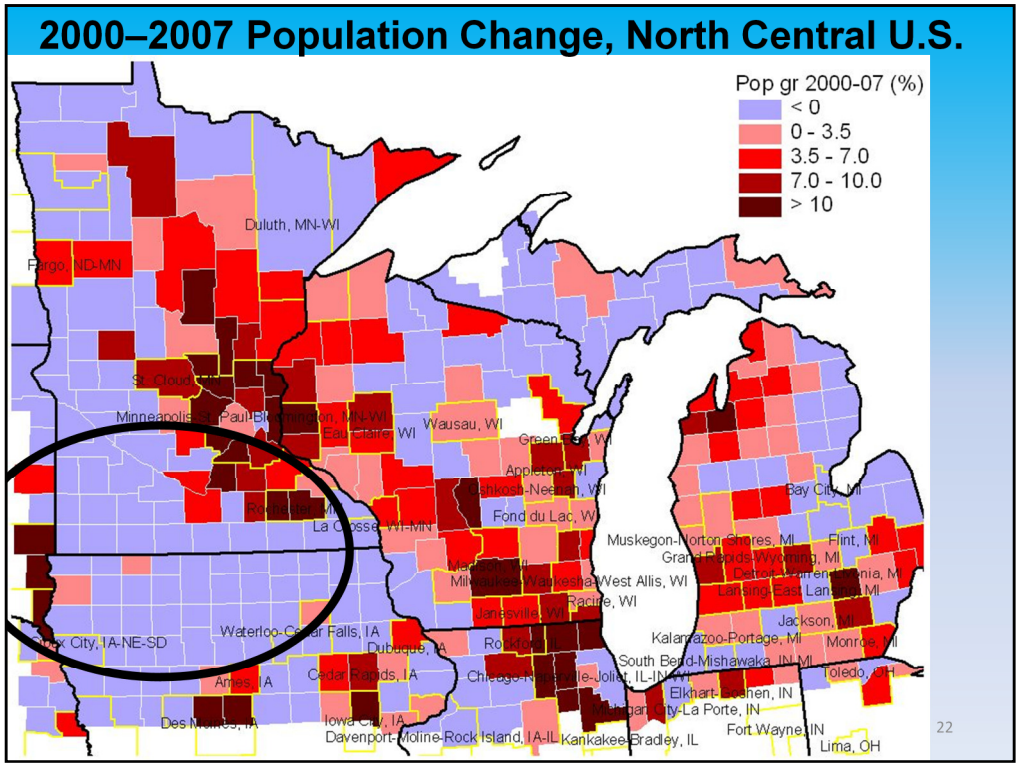
Swenson argues in *The Economic Impact of Ethanol Production in Iowa* that many projections of the economic impact of corn ethanol suffer from improper input-output modeling and frequently overestimate the number of jobs that could be created by the industry. He found that the ethanol boom that occurred between 2000 and 2005 did not lead to the creation of many construction jobs. Instead, much of that construction work was undertaken by out-of-state firms that brought specialized workers with them.

Once an ethanol plant is finished, it rarely requires many workers. A 50 million-gallons-per-year (MGY) ethanol plant requires only 35 direct workers, while the more intensive 100 MGY plants still only require 46 employees. In addition, the number of full-time employees required for these plants is expected to decline as the technology becomes more advanced.

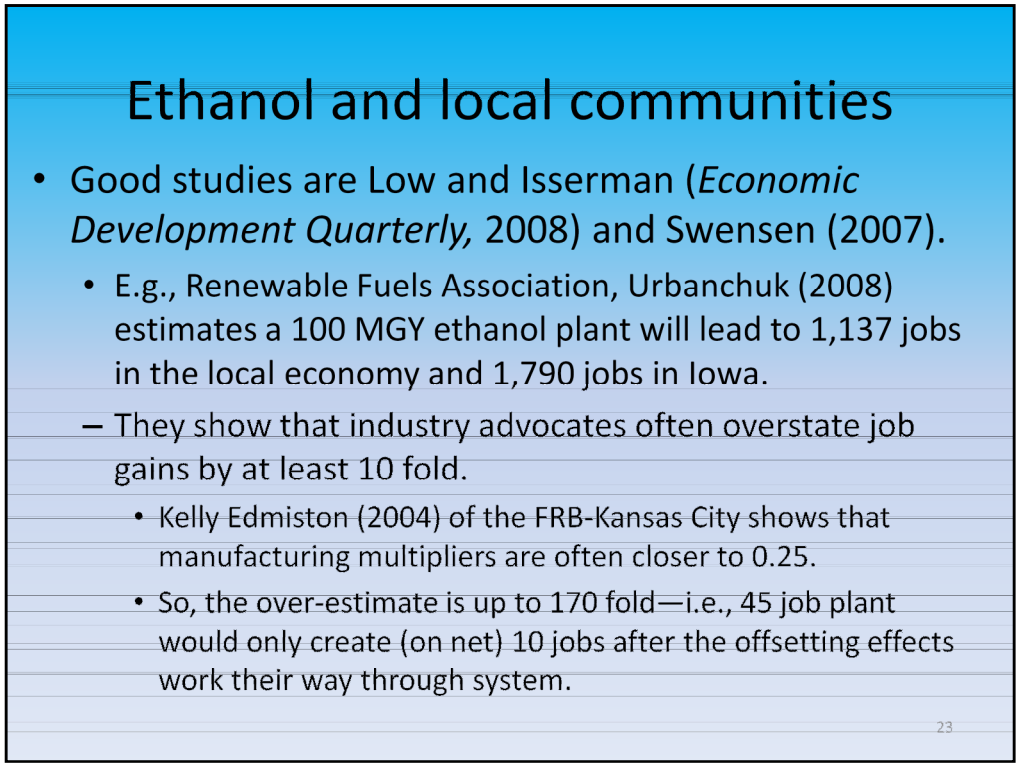
Some of the other most frequent errors made in modeling the impact of ethanol pointed out by Swenson include:

•Corn Production – Models often include the corn grown for ethanol as a new activity. In most cases, this corn is already being produced. In cases in which new corn would have to be grown, that land would have previously been used to produce other crops.

•Transportation – Many models include new jobs in transportation and trucking, under the assumption that ethanol plants will need new supply lines. Farmers, however, already use trucking companies to move their corn. In fact, by building local ethanol plants, the state may even see a reduction in the demand for transport services.



Circle shows concentration of ethanol and wind turbines. Note despite Iowa becoming a corn importer and wind turbines, population loss is still persistent. Growth likely to be greater during construction phase as well. Other factors driving pop change.



Low, Sarah A. and Andrew M. Isserman (2008). "Ethanol and the Local Economy: Industry Trends, Location Factors, Economic Impacts, and Risks." *Economic Development Quarterly.*

Swensen, David. "**Understanding Biofuels Economic Impact Claims."** Iowa State University, Department of Economics, April, 2007.

Edmiston, *Kelly D*. (2004). "The Net Effects of Large Plant Locations and Expansions on. County Employment," *Journal of Regional Science*, 44 (2), 289 – 319.

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•Regional Offsets – Other industries that compete for many of the same input resources, such as hog and poultry producers, will have to pay more for resources and services. Also, the cost of corn-based feeds will increase for these industries.

Since corn production in Iowa – and any other state – is naturally limited by the availability of land and other resources, the number of ethanol plants a state can accommodate is finite. According to Swenson, even if Iowans were able to produce two billion bushels of corn, the state would still only require 55 plants averaging 90 MGY in size. In 2005, the state grew only 400 million bushels. In 2009, 42 ethanol plants will already be operational, and the state appears to be approaching its ceiling for ethanol production and employment.

Swenson does not propose ending state support for the biofuels industry, but he does suggest that some of the state's justifications for its ethanol programs are based on misleading employment indicators. The overall impact may be smaller than expected in the state, even though Iowa has long been a national leader in biofuels production. For other states, with even less land dedicated to corn production and with less focus on ethanol, the employment impact may be even more limited.

Other factors for ethanol

- New corn production overestimated
- New transport jobs are overestimated
- Other regional offsets from higher input costs though there could be feeder lots
  - Source: Swenson (2007)
- Water treatment also varies considerably in cost and availability. Higher taxes cause job losses.
  - A large, 100 MGY plant consumes the amount of water used by a community of 15,000 people.
    - Source: Low and Isserman (forthcoming)
- There could be noise, dust, and transport infrastructure costs.

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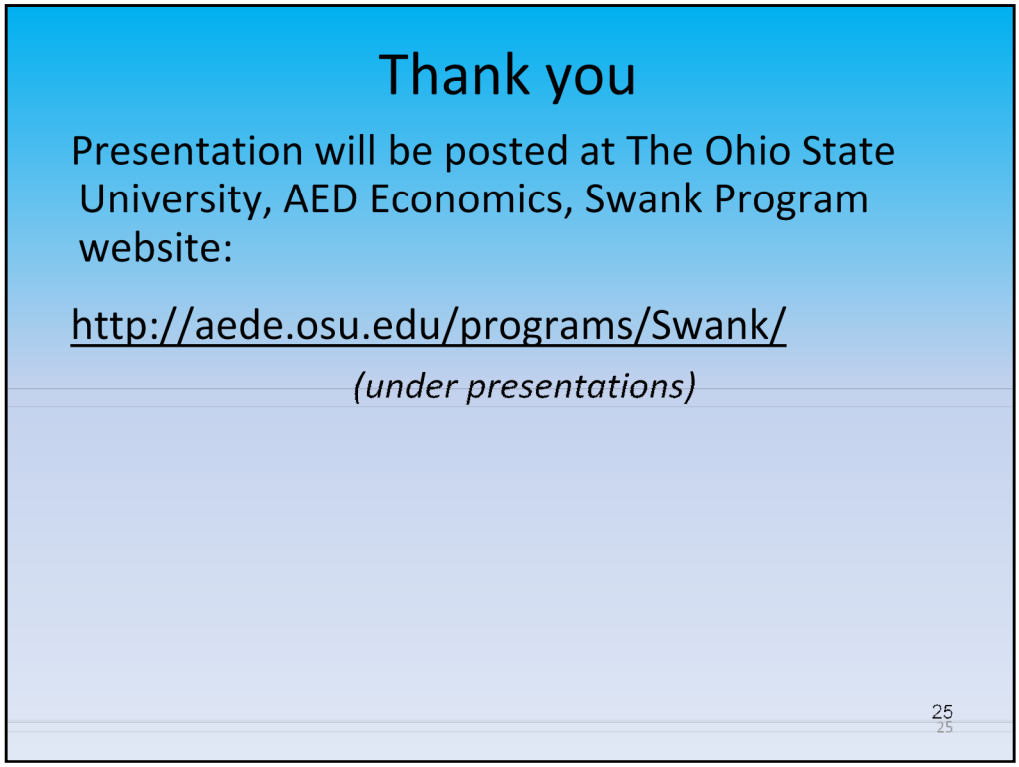

To conclude, I want to reaffirm what a pleasure it has been here today. I hope this presentation has stimulated you, not only for the remainder of this workshop, but also to go back and to your communities and try new innovative solutions.

Appendix Slides

Source for electricity generated in from MT/WY coal.

Coal Production 2006 (Thousand Short Tons)	Number of Mines	Production
Wyoming	21	446,742
Montana	6	41,823
US. Total	1,438	1,162,750
WY share of US total coal production	0.38	
MT share of US total coal production	0.04	
Share of US electricity generated by coal, 2006	0.498	
US residential consumers of electricity, 2006	122,471,071	
share of electricity generated by WY coal	0.19	
share of electricity generated by MT coal	0.02	
# of residential consumers powered by WY coal	23,433,291	
# of residential consumers powered by MT coal	2,193,773	
Source: Energy Information Administration http://www.eia.doe.gov		

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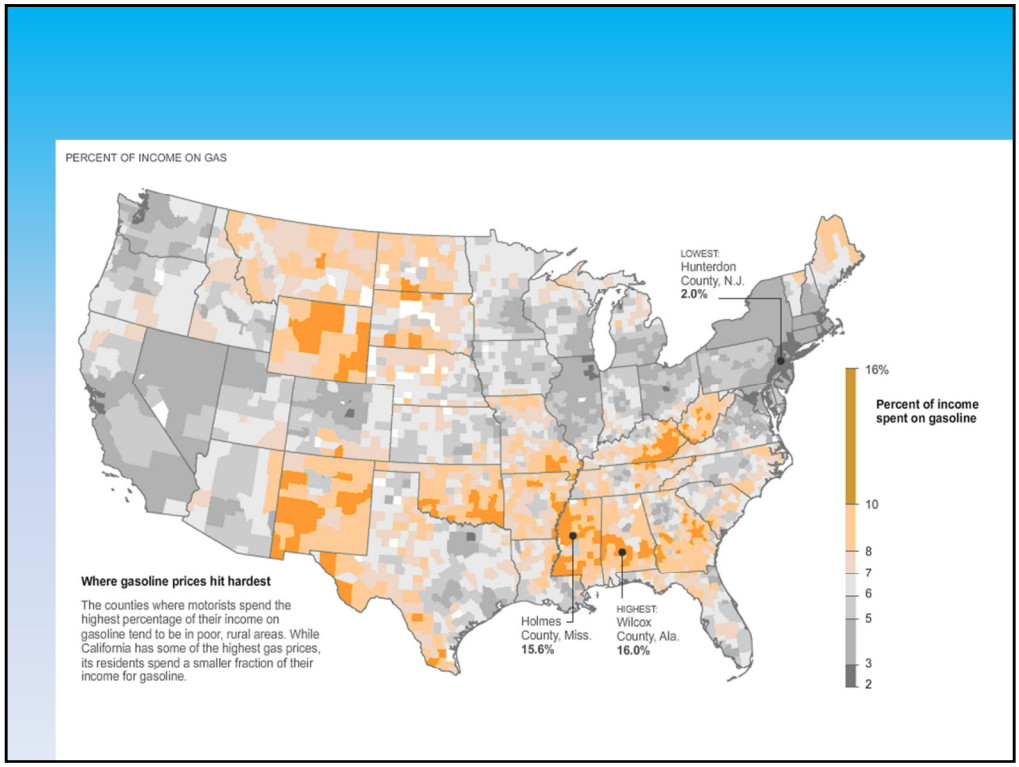

Source: Krauss, C. "Rural US Takes Worst Hit as Gas Tops $4 Average," *New York Times,* June 9, 2008. http://www.nytimes.com/2008/06/09/business/09gas.html