ACORE

The American Council On Renewable Energy

ACORE 20 GW Plan for Kansas

Economic Revitalization through Renewable Energy: Will Kansas Reap the Benefits of this Crop?

Topics

- About ACORE
- Renewable Energy in America
- The Assessment in 2008
- Results: Renewable Energy in Kansas
  - Wind
  - Solar
  - BioPower
- Summary

ACORE's 650+ Organizational Members

Assembling All the Players Necessary to Make Renewable Energy Successful in the U.S.

Membership Circles

Member Committees

- Leadership Council
- International Committee
- Utility Committee
- Higher Education Committee
- Biomass Coordinating Council
- Climate Committee
- Economics Committee
- Financial Services Committee
- US-China Program
- ABA – ACORE Joint Committee on Renewable Energy

Policy Conference
"Phase II of Renewable Energy in America"
Cannon Caucus Room, Washington, DC
November 19-20, 2009

RETECH 2010

Renewable Energy Technology Conference & Exhibition

Washington, DC Convention Center

Next: February 3-5, 2010

ACORE Leadership Council

Mission: to bring together the nation's renewable energy leaders to advance the state of renewable energy in America

2008 Leadership Dinner in the Library of Congress

- Chairmen
- CEO's
- Presidents
- Managing Directors
- Managing Partners
- Government officials
- University Presidents
- Association directors
- Nonprofit leaders
- Other leaders

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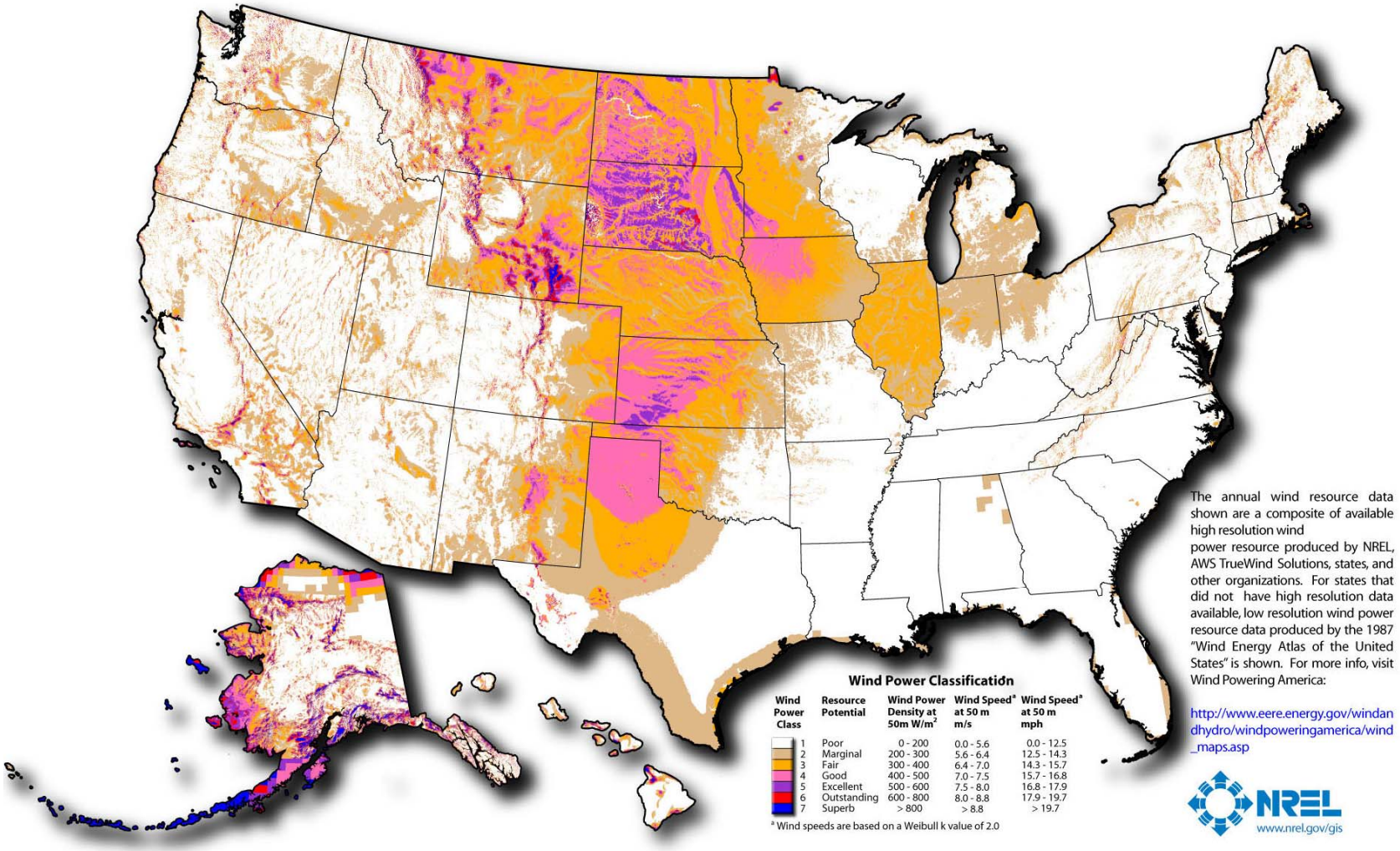
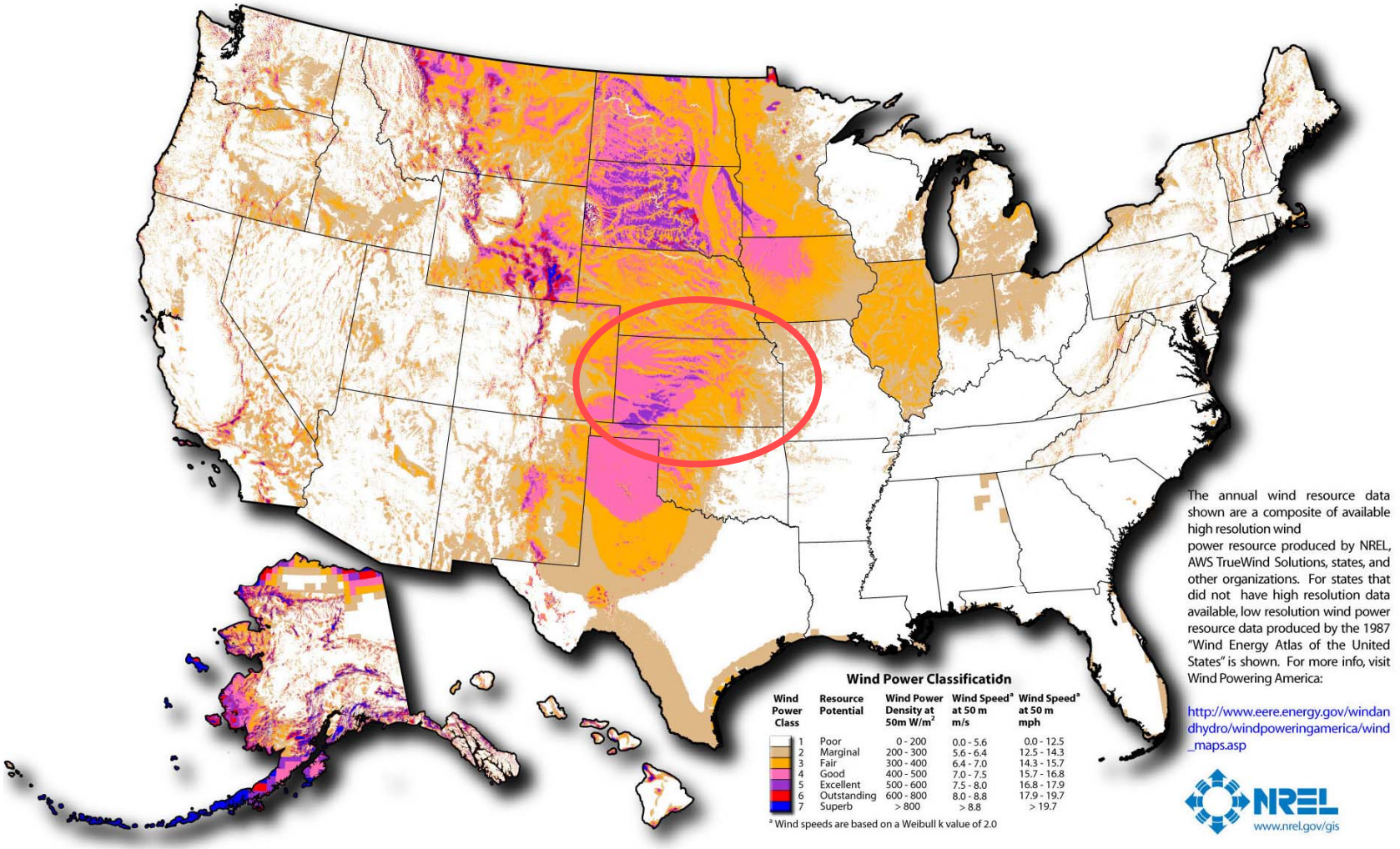
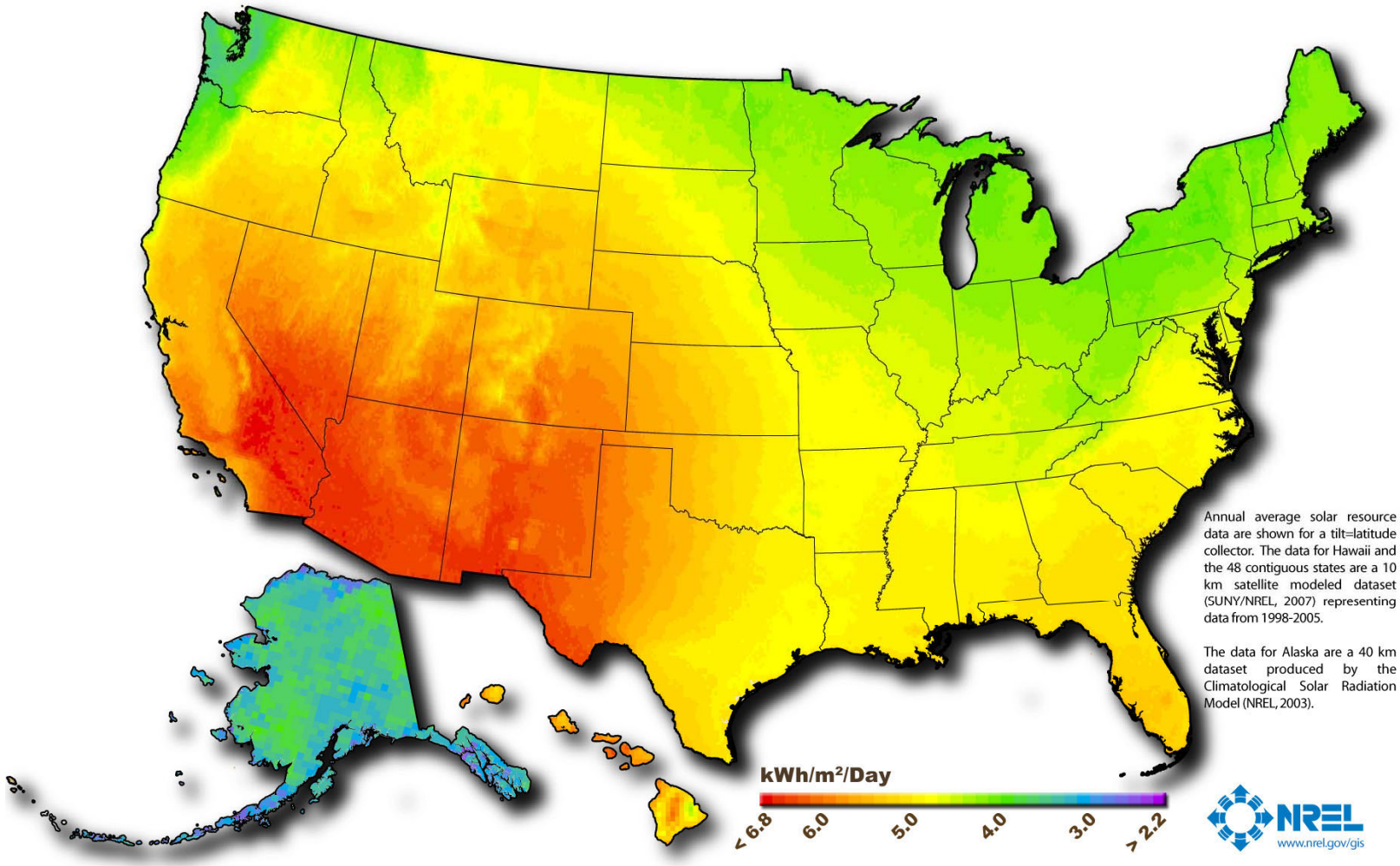
U.S. Wind Resource (50m)



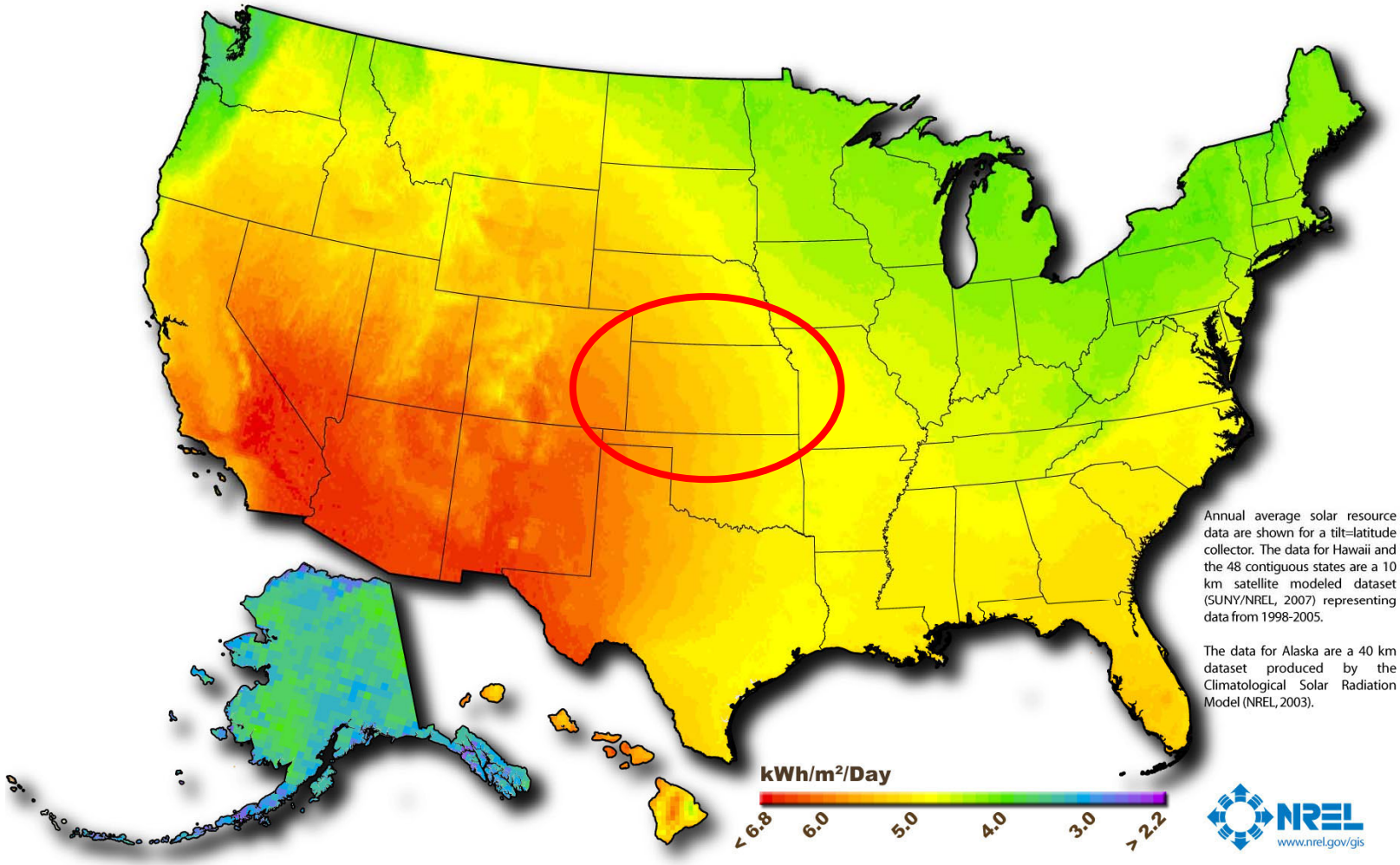
U.S. Wind Resource (50m)



U.S. Solar Resource



U.S. Solar Resource



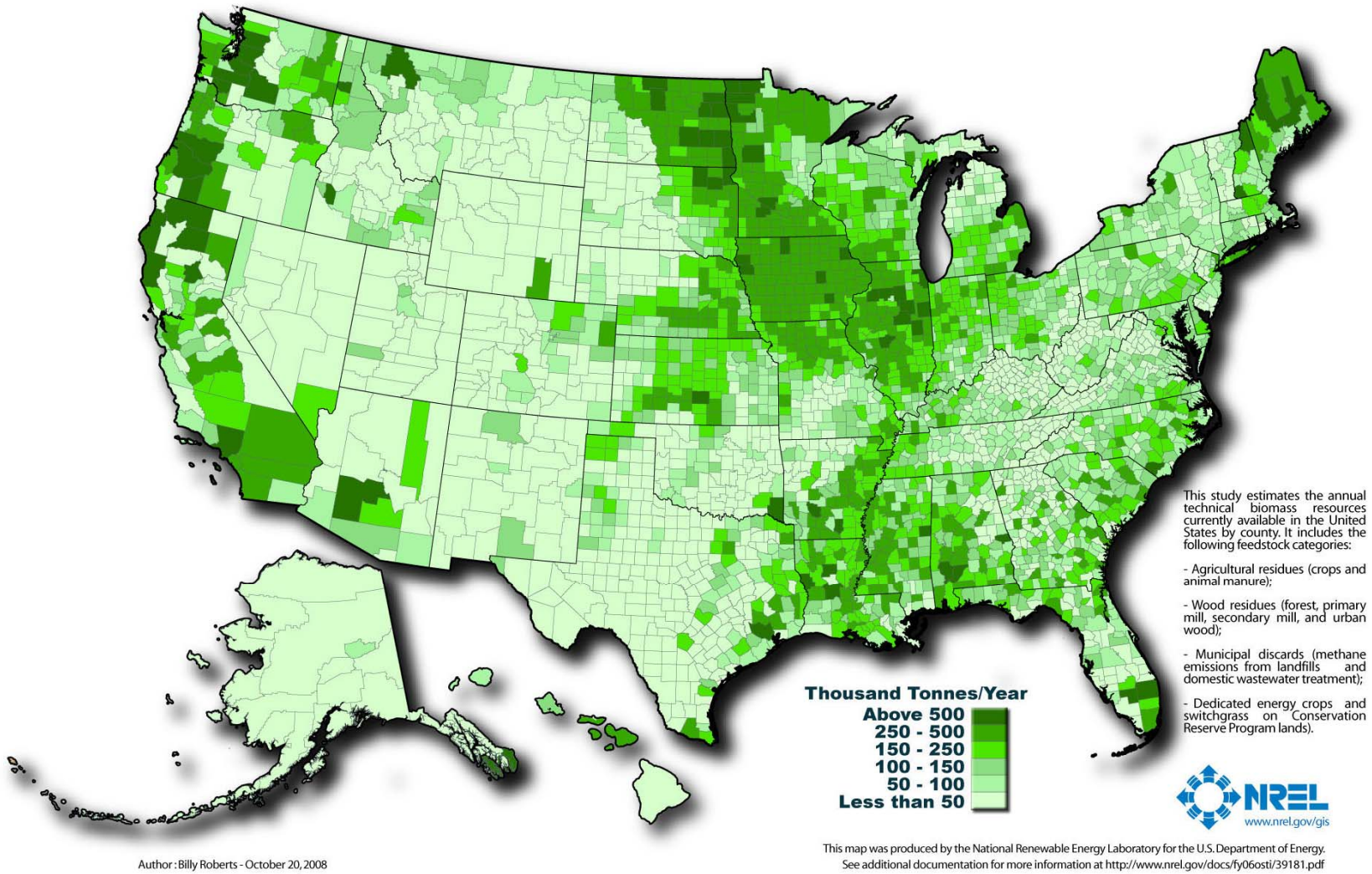
Annual average solar resource data are shown for a tilt=latitude collector. The data for Hawaii and the 48 contiguous states are a 10 km satellite modeled dataset (SUNY/NREL, 2007) representing data from 1998-2005.

The data for Alaska are a 40 km dataset produced by the Climatological Solar Radiation Model (NREL, 2003).

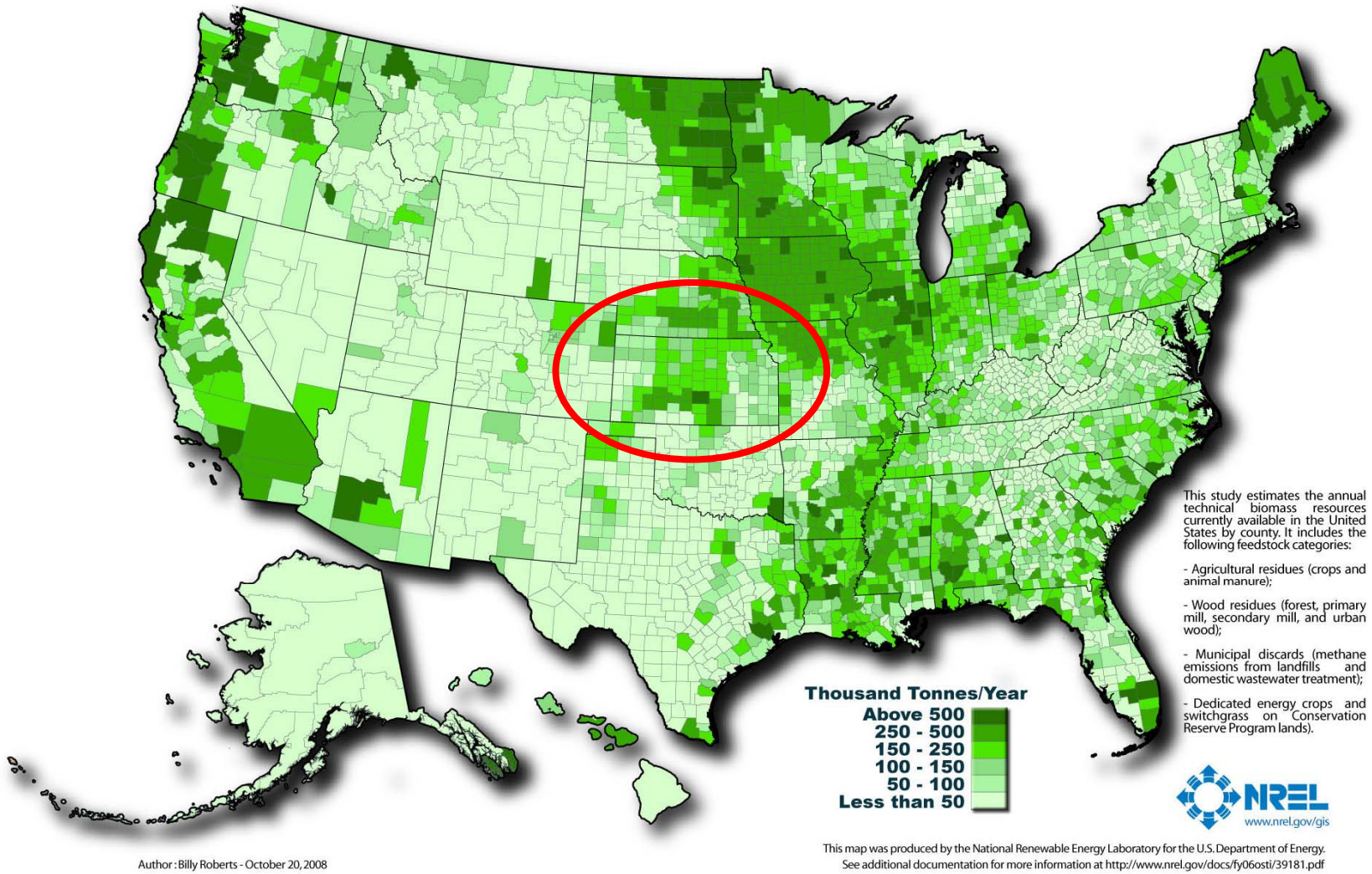
Author : Billy Roberts - October 20, 2008

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy.

U.S. Biomass Resource



U.S. Biomass Resource



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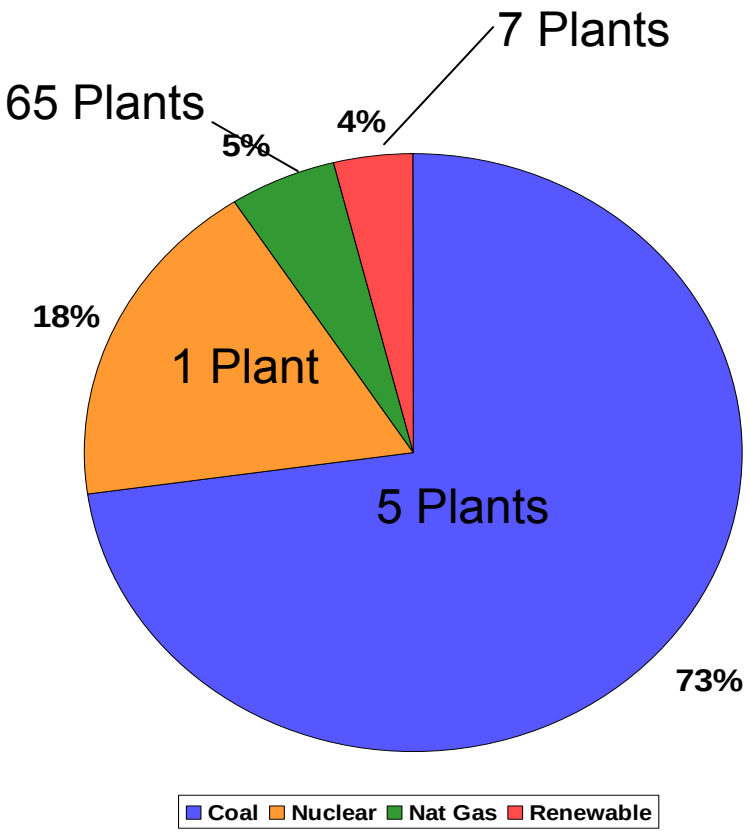
Kansas Future in Renewable Energy

Presentation to the Kansas Wind & Renewable Energy Conference

September 24, 2008

Mike Eckhart
American Council On Renewable Energy (ACORE)
www.acore.org

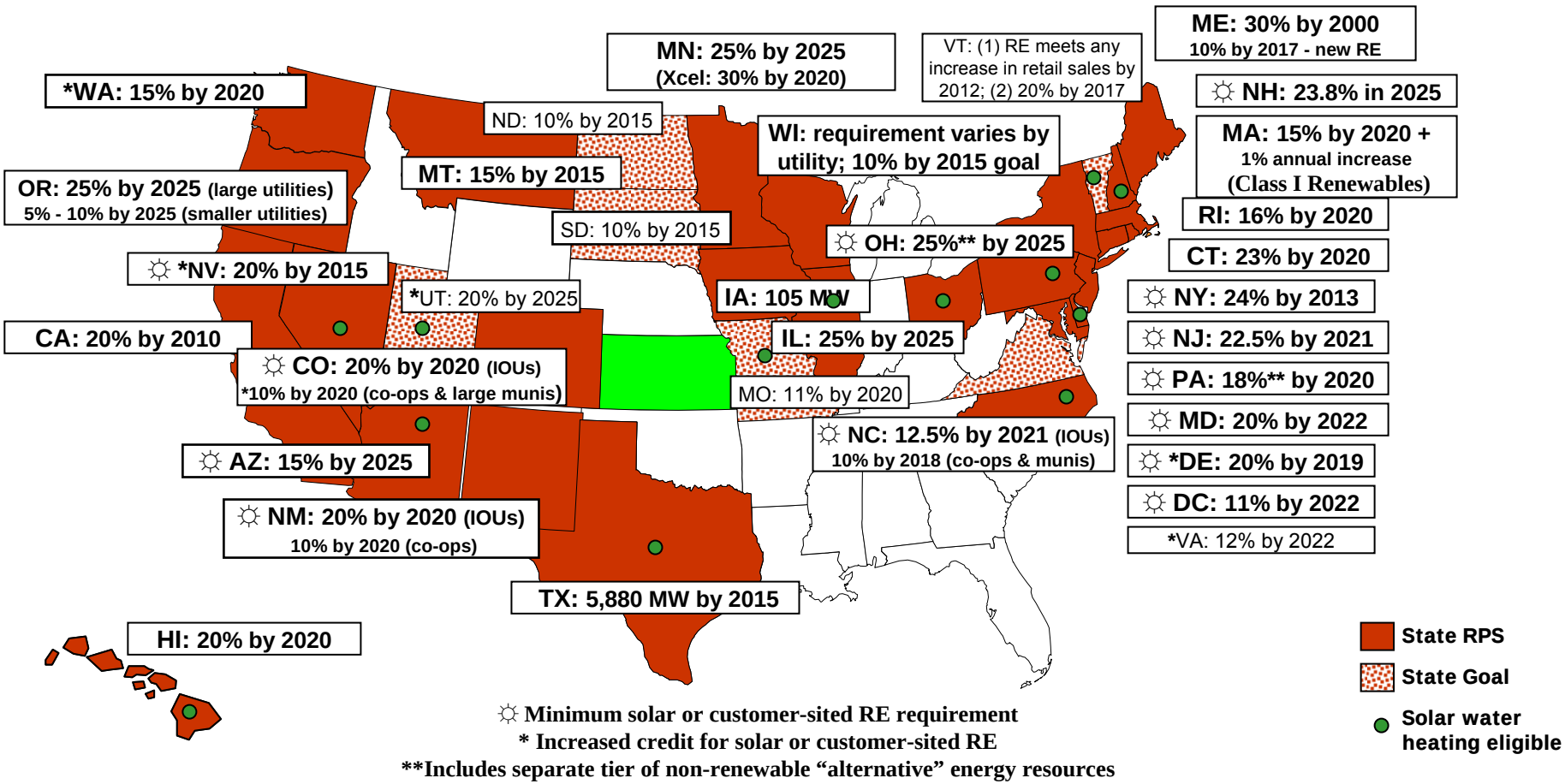
Kansas Electrical Generation 46,919,000 MWH



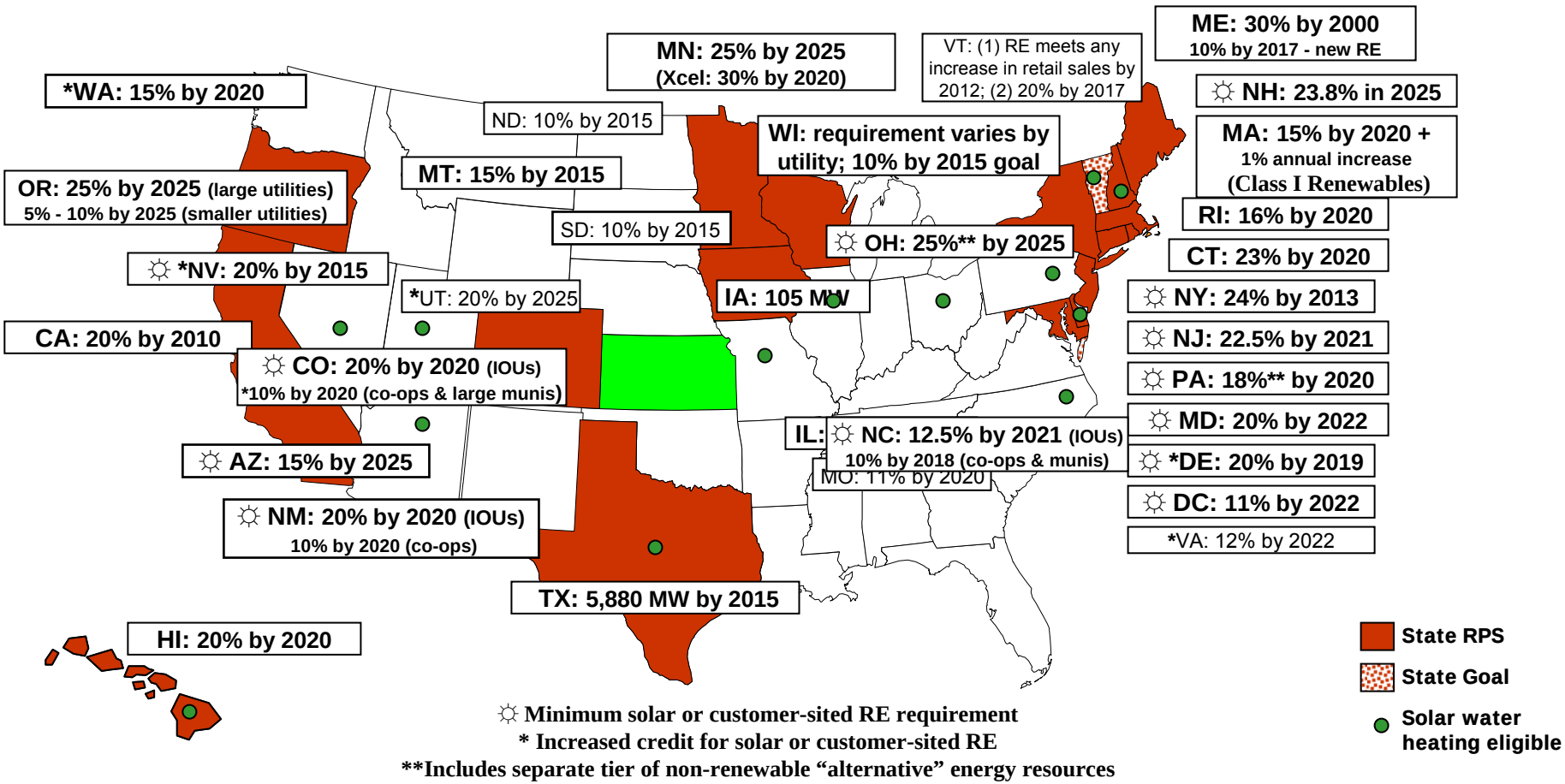
Major Plants	
Holcomb	349 MW
Jeffrey	2160 MW
La Cygne	1578 MW
Lawrence	566 MW
Nearman C	261 MW
Wolf Creek	1236 MW

Source: EIA, 2008

Kansas is Surrounded by States that have acted to Increase Renewable Energy

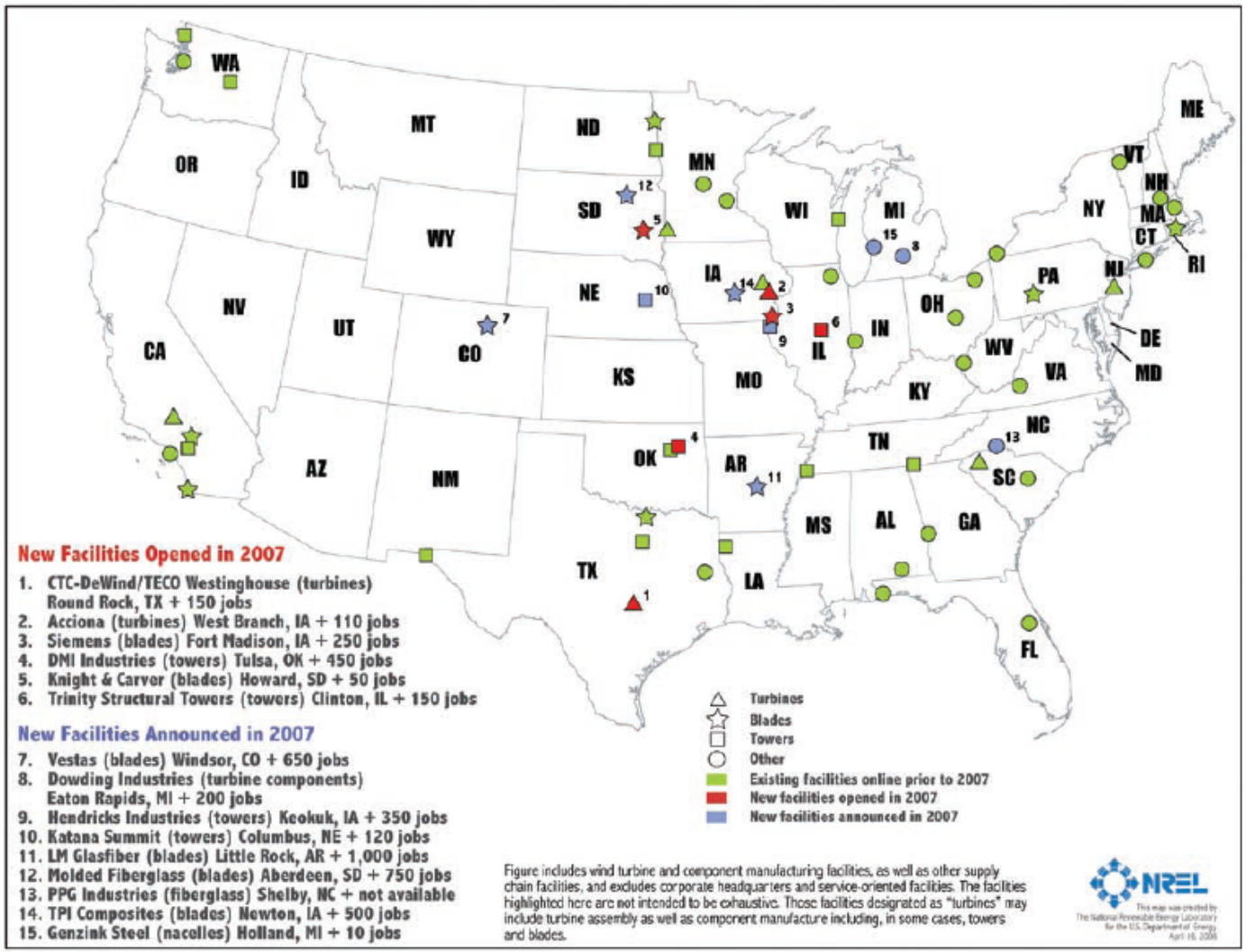


Other States are getting the RE Companies and Jobs

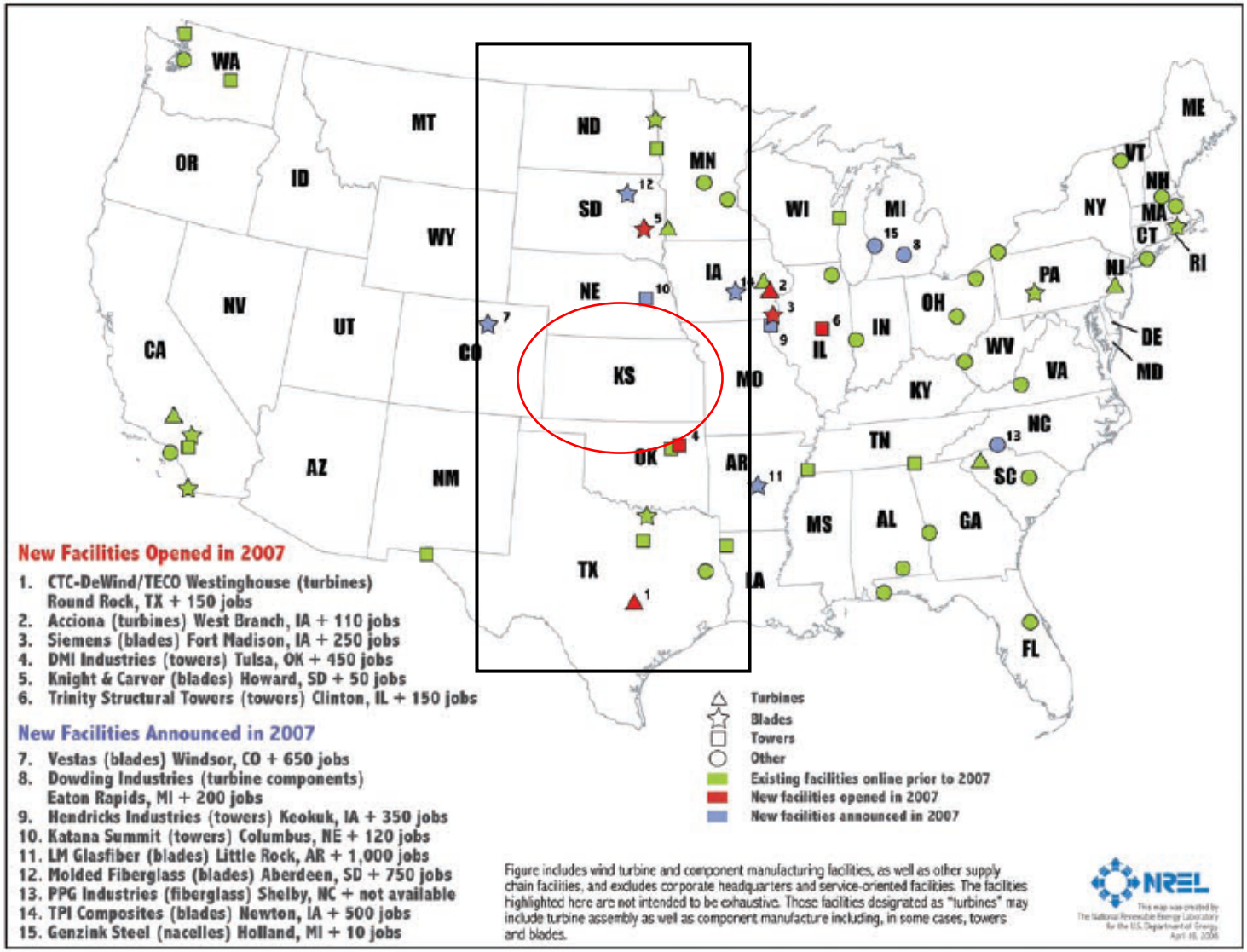


☼ Minimum solar or customer-sited RE requirement
* Increased credit for solar or customer-sited RE
**Includes separate tier of non-renewable "alternative" energy resources

Wind Component Manufacturing Locations



Wind Component Manufacturing Locations



ansas

Wind Potential: 3rd in the US
120,000 MW

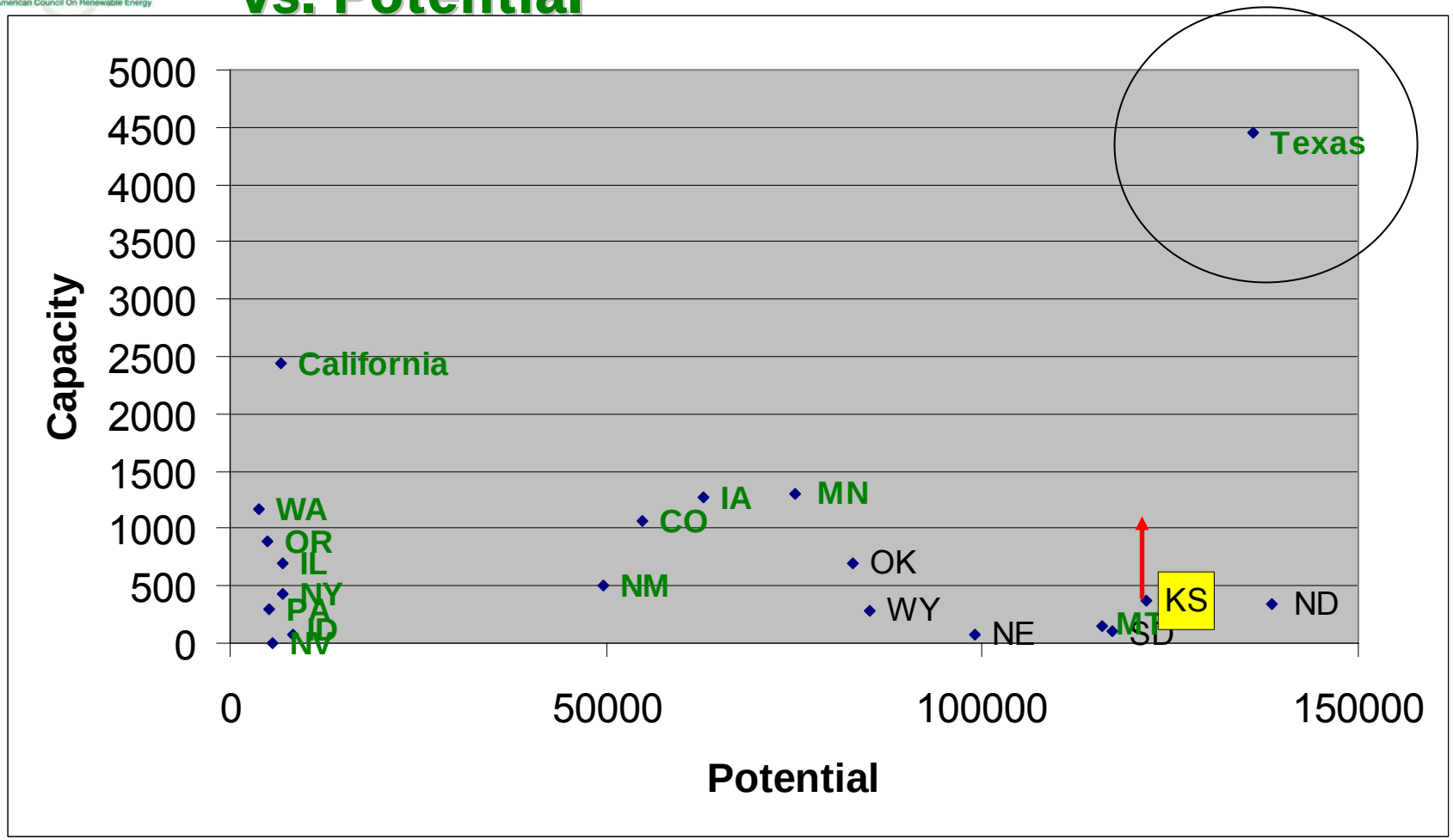
Total State Peak Load:
10,000 MW

3TIER
www.3tiergroup.com

5km Wind Map at 80m
Wind speed
3 6 9 m/s

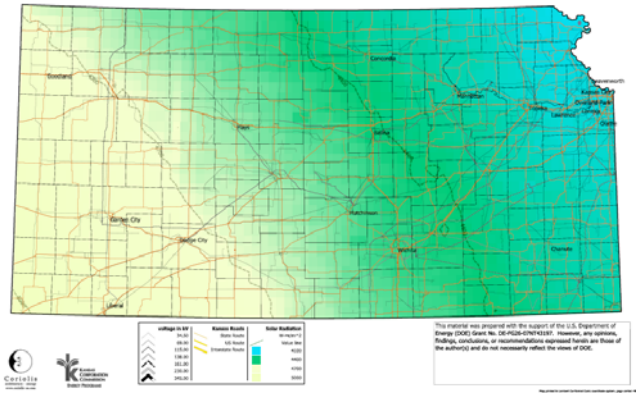
Kansas

State Wind Development vs. Potential



*States in green have RPS

Kansas Solar Energy



- Western Kansas:
  - "Excellent" potential for photovoltaic power
  - "Particularly good" potential for solar thermal-electric
- No major projects underway yet

Source: DOE

Kansas
Biofuels and Biomass

Biofuels

11 existing ethanol plants

Total capacity: **527 mgpy**

9 ethanol plants in development

Additional capacity: **628.3 mgpy**

Abengoa Bioenergy constructing $400 million cellulosic ethanol plant in Hugoton—will produce 30 mgpy of second generation ethanol.

Biomass

Crop and crop residue biomass: **13.9 million dry tons**

Cellulosic biomass: **8.1 million dry tons**

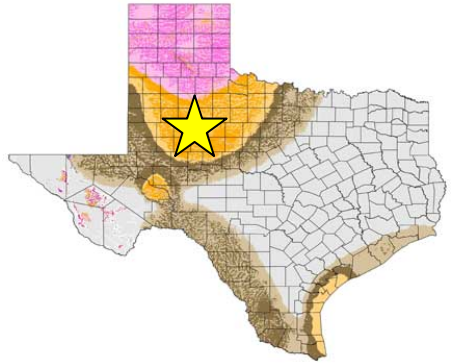
Upcoming projects: Biomass cofiring plant under construction in Goodland—owned by Energy Holdings.

Manufacturing Job Loss

- In past 6 years, Kansas has lost **10,944 manufacturing jobs**
  - 6% of total manufacturing workforce
- Manufacturing fell from 18% of the total non-farm workforce to 16.6% over that time.
- Manufacturing is important to Kansas

Source: US Department of Labor

Economic Case Study: Nolan County, Texas



- Current Wind Capacity: **2,500 MW**
- Future: **add 3,000 MW by 2009**
- **More wind capacity than California**
- **1,124 direct jobs** in Nolan County
  - 20% of the county's workforce.
  - Permanent O&M jobs make up 29% of direct jobs
- 2008 economic impact in Nolan County: **$315 million/year**

Source: "Nolan County: Case Study of Wind Energy Economic Impacts in Texas." Prepared by New Amsterdam Wind Source LLC.

Closing Thoughts in September 2008

- **Kansas has excellent renewable energy resources**
- **Kansas can begin to receive economic benefits**
- **ACORE urges Kansas to continue its commitment to renewable energy, and we stand ready to help.**

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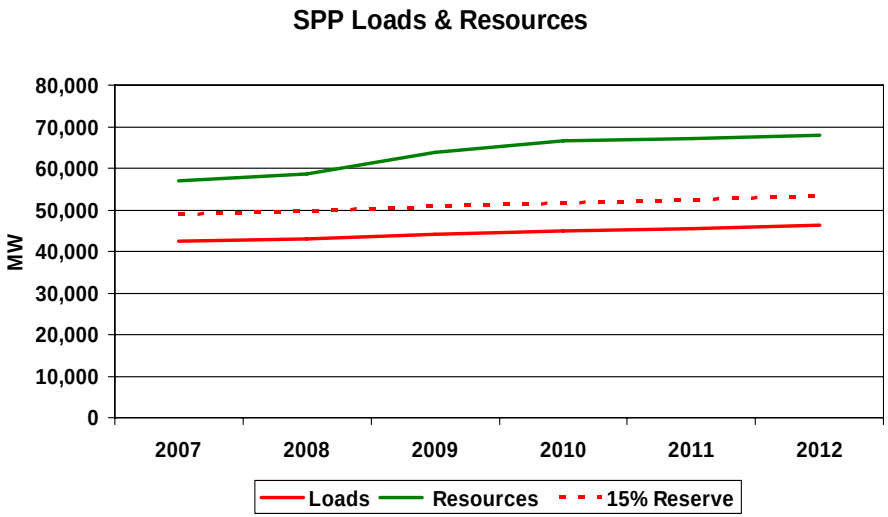
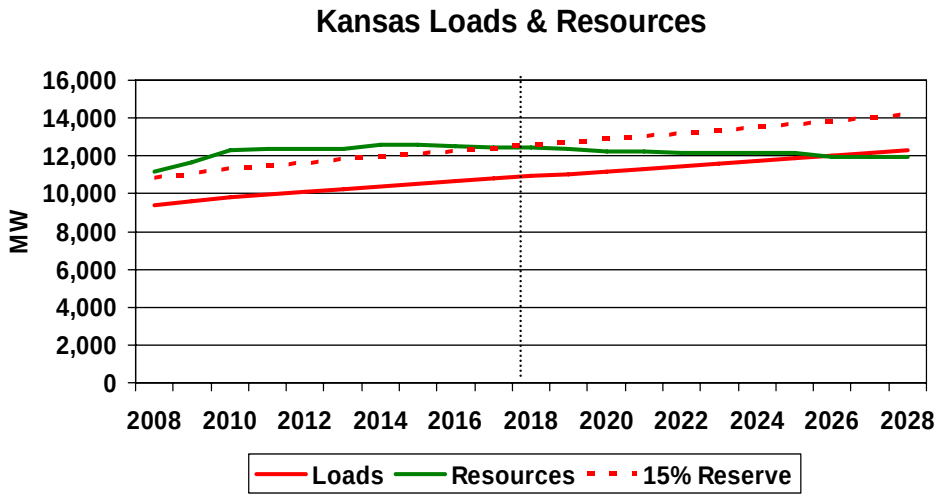
Need for Capacity



Source: Kansas Energy Council Electricity Committee, Forecast Capacity and Load Summary, 11/24/2008



Source: Southwest Power Pool December 2008

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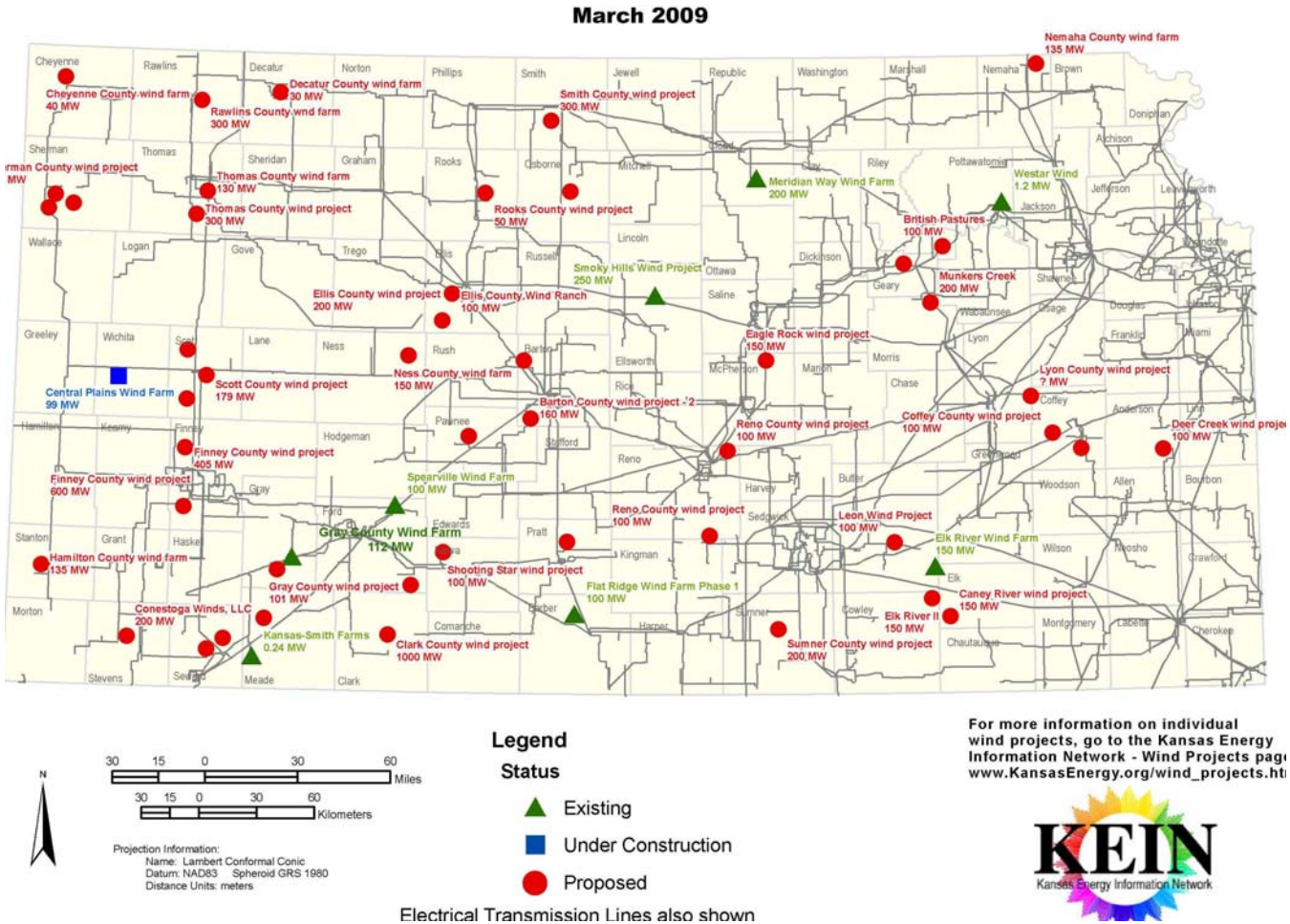
Existing and Proposed Wind Projects in Kansas Exceeding 6,200 MW

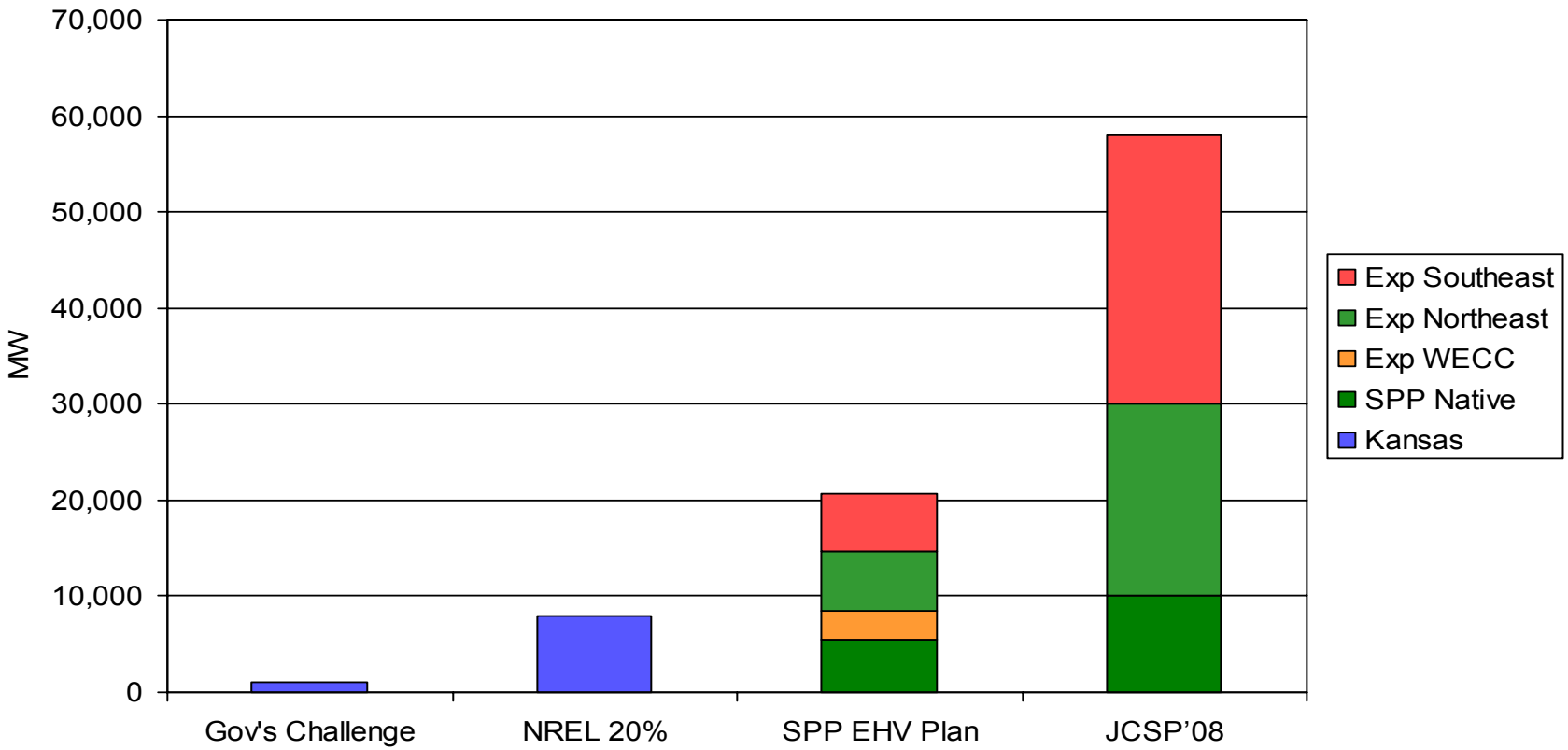


Renewable Energy Forecasts Considered in this Plan

ACORE reviewed and incorporated the following renewable energy analyses and forecasts in developing this plan:

- National Renewable Energy Laboratory (NREL)
- Southwest Power Pool (SPP) Extra High Voltage Study
- Joint Coordinated System Plan (JCSP)

Summary of Forecasts: SPP & Kansas Wind Power Opportunities



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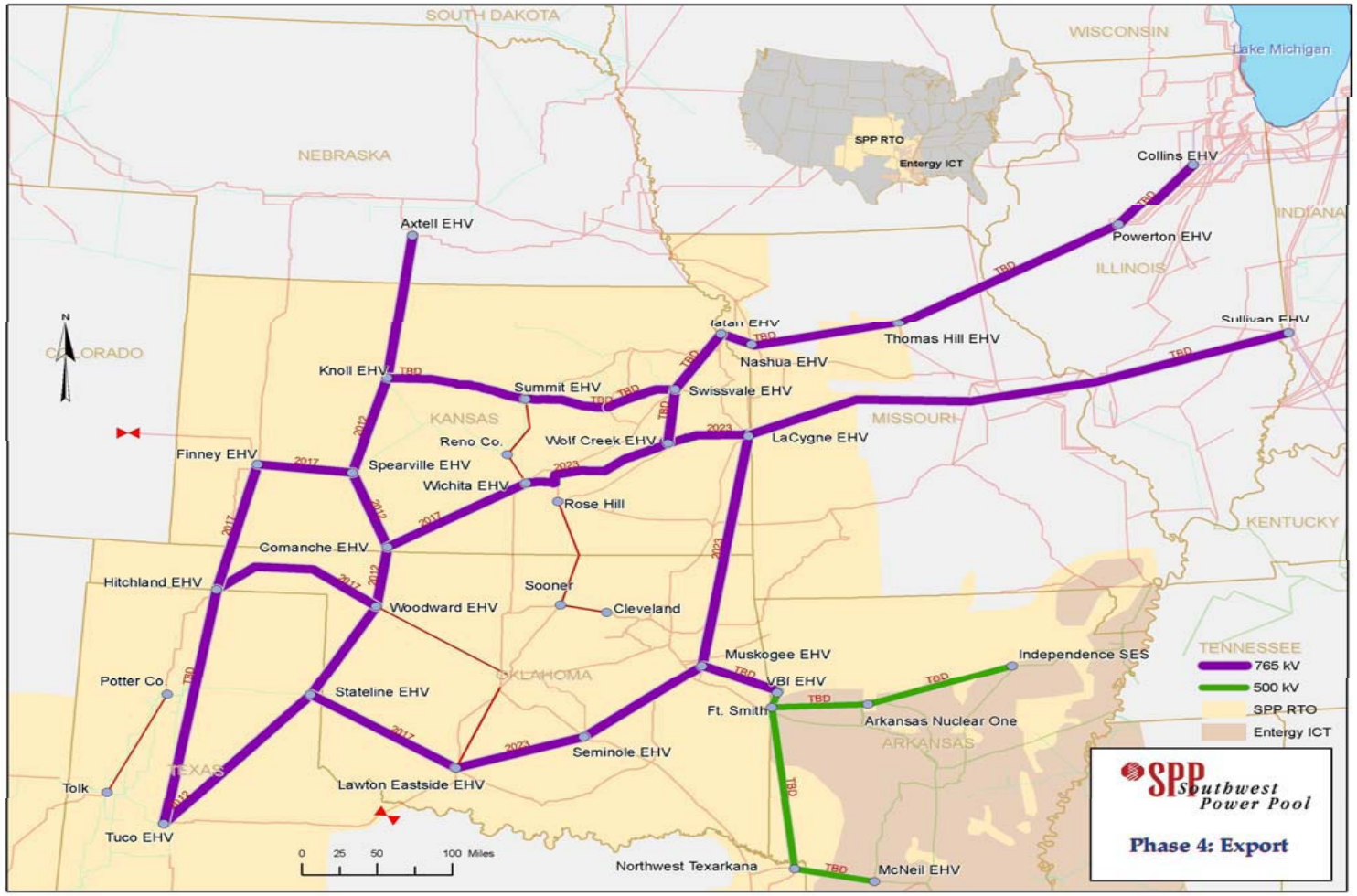
SPP EHV Transmission Plan
20 GW from SPP



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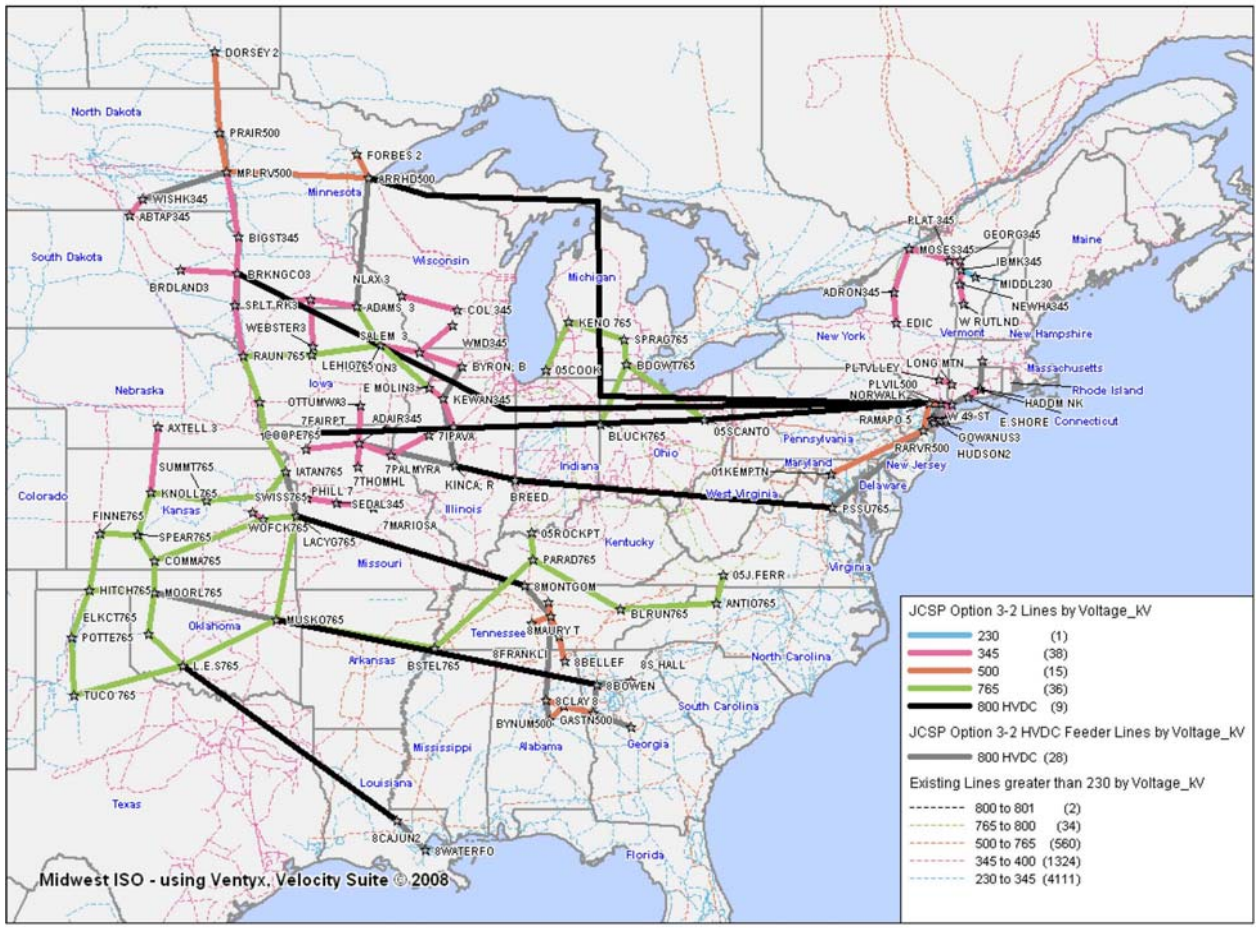
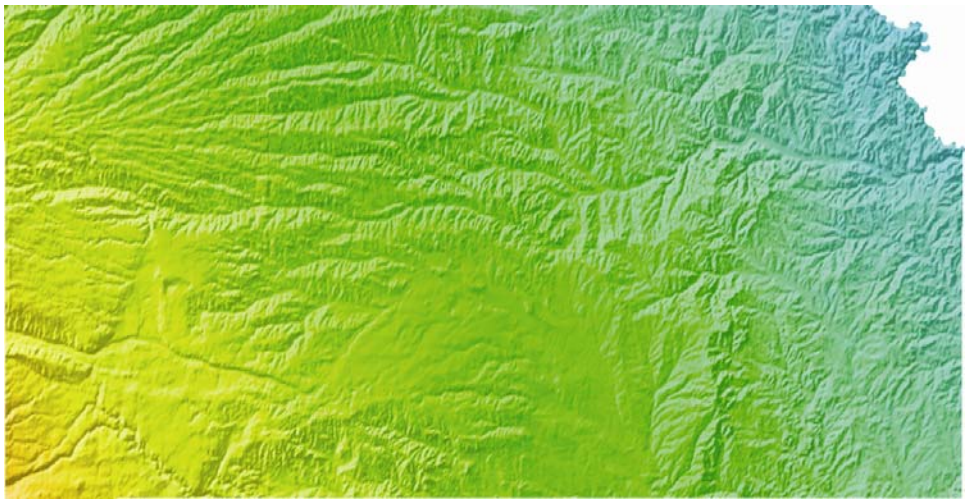
Joint Coordinated Systems Plan 60 GW from SPP

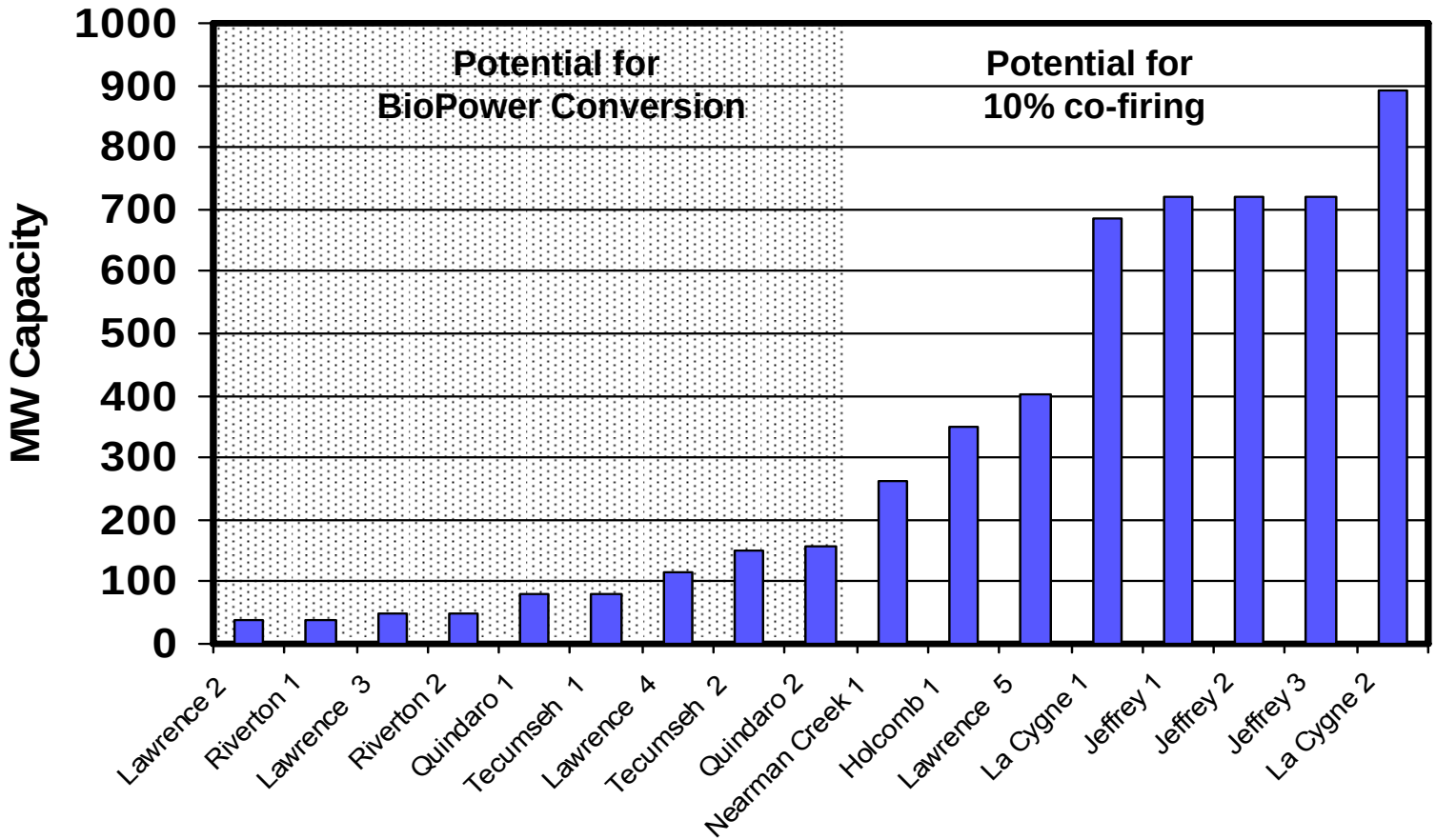


Kansas's Renewable Energy Potential: Kansas has a good solar resource, especially in Western Kansas.

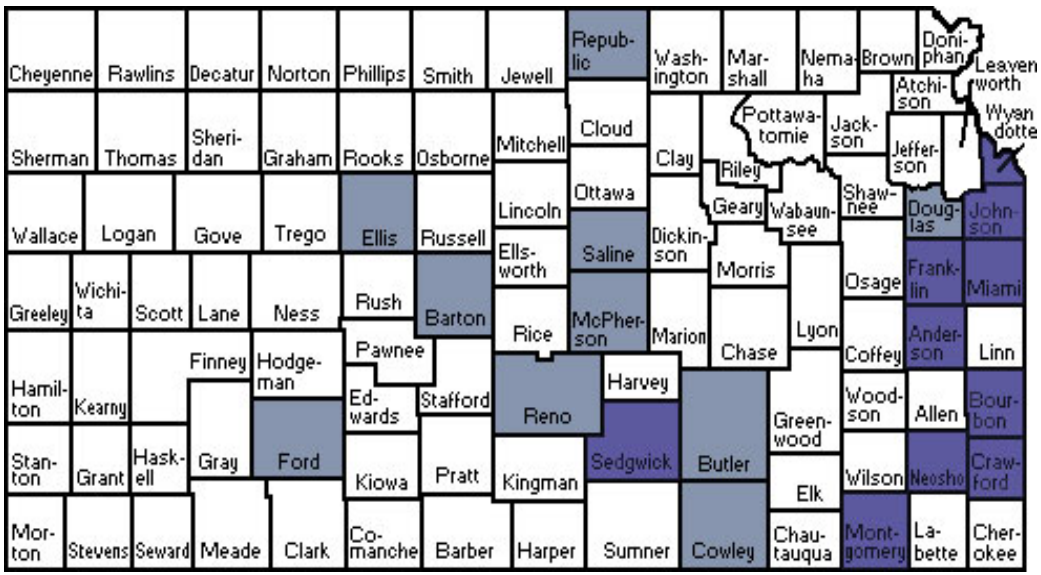


Biomass Potential ~ 1100 MW
7 Million MWH/Yr or 5 Million Tons of Biomass

ACORE assessment: The smaller-scale coal units are candidates to convert to biomass solid fuels; the larger-scale units are candidates for 10% co-firing.



Manufacturing
REPP Study: Kansas Counties with Greatest Potential for Renewable Energy Manufacturing



Counties colored in purple have a 6% unemployment rate or greater.

The potential manufacturing benefit is concentrated primarily in the Southeastern region of the state.

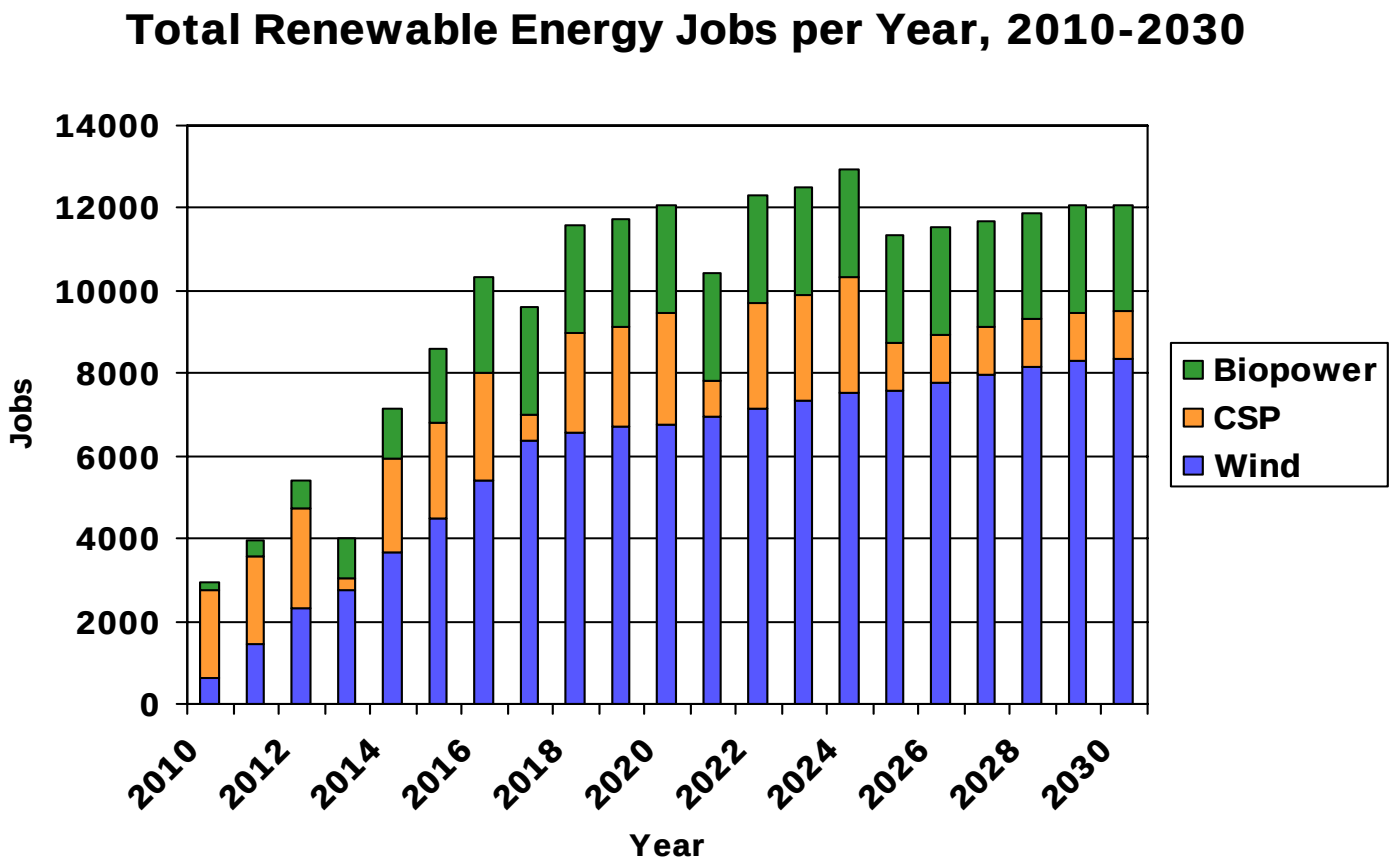
The REPP Study can be found at http://www.repp.org/Domestic_Manufac_State_KS.htm.

Economic Impact of the 20 GW Plan: Wind Energy, CSP, and Biopower Earnings and Economic Output

Gross Economic Impact of 20 GW Wind, Solar, and Biomass Power in Kansas, 2010-2030		
	Cumulative Earnings (Construction and O&M)	Cumulative Economic Output (Construction and O&M)
19,000 MW Wind	$4,377,000,000	$12,799,000,000
1600 MW CSP	$2,090,000,000	$4,930,000,000
48 Pellet Plants (5,000,000 tons per year production)	$792,720,000	$5,947,260,000
Total	$7,259,720,000	$23,676,260,000

Source: ACORE analysis performed for the state of Kansas in 2009, using the National Renewable Energy Laboratory's Job and Economic Development Impact Model.

Jobs Impact of the 20 GW Plan: Wind Energy, CSP, and Biopower Job Creation



Source: ACORE analysis performed for the state of Kansas in 2009, using the National Renewable Energy Laboratory's Job and Economic Development Impact Model.

Conclusions

- Conclusions: Kansas has the opportunity to develop 20 GW of renewable electric power supply:
  - 18 GW of wind power
  - 1 GW of biopower
  - 1 GW of solar power
  - Totaling 20 GW of renewable energy
- The principal opportunity, after serving Kansas load, is exporting in the SPP and further to the South and East.
- This plan would create $23 billion of cumulative economic impact and 12,000 jobs in Kansas from now to 2030.
- ACORE recommends that Kansas adopt the plan as a state goal, and take the actions necessary to put it into motion:
  - Renewable energy project development incentives
  - Economic incentives for new businesses
  - Financing and other special programs.

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