



# The Impact of Renewable Energy in Southern Economies

CSG Regional Policy Webinar Series | Presented by CSG South



The Council of State Governments  
Sharing capitol ideas.

# Wind and Solar in the South

*Energy Resource and Economic  
Development*

**Charlie Coggeshall**

**10-17-2013**

***Council of State Governments***

# About Us

*For more than 25 years the Southern Alliance for Clean Energy has worked to promote responsible energy choices that create global warming solutions and ensure clean, safe and healthy communities throughout the Southeast.*



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# Speaker

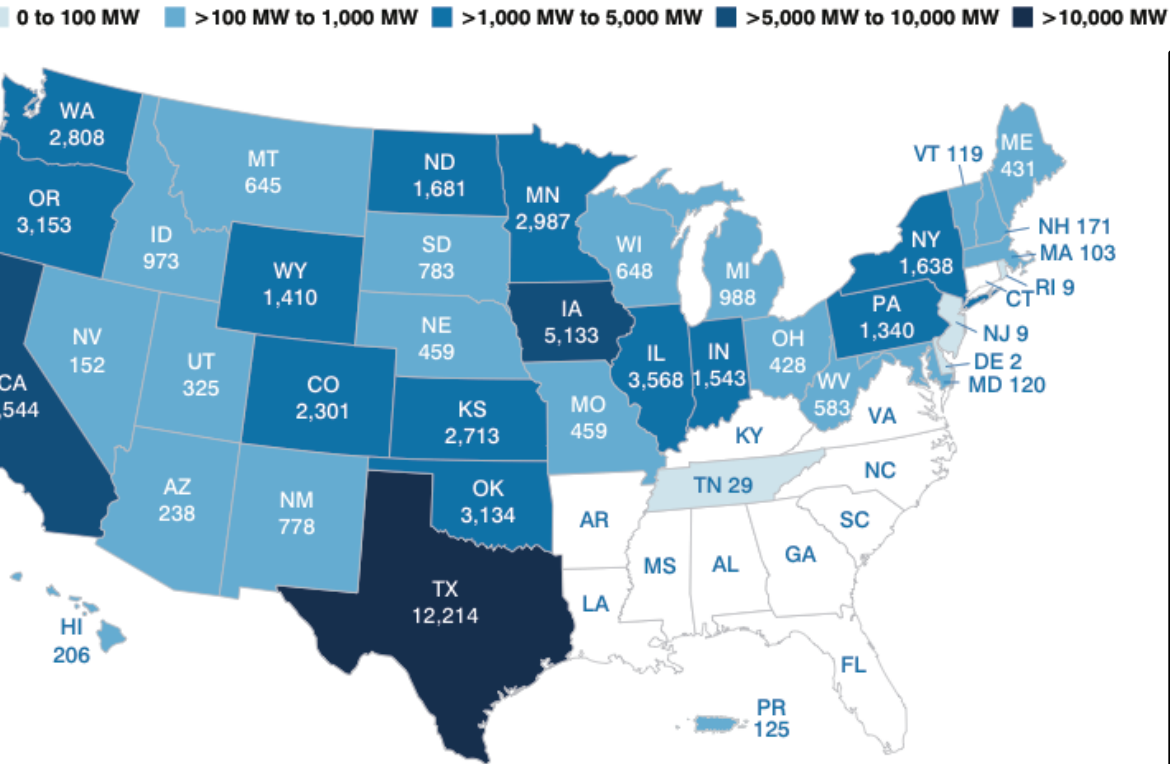
- Charlie Coggeshall
  - Renewable Energy Manager
  - [charlie@cleanenergy.org](mailto:charlie@cleanenergy.org) / 415-595-6119
  - Background: Business and policy. MBA with previous positions at NREL & DOE



# Key Message Today

***Wind and Solar are already making positive impacts in the south, though the market is hardly tapped***

# Wind Capacity by State (2012)



- In 2012, ~13 GW added via \$25B invested
- Over 60 GW now installed
- Texas #1 in capacity

Wind energy accounted for 43% of all new generating capacity in 2012 – more than any other source.

# Wind in the SE: Current Events

## Existing Projects

- TVA (29 MW)

## Proposed Projects

- NC (800 MW+)
- SC (80 MW)
- KY (100 MW)
- FL (200 MW)
- LA (450 MW)
- AL (100 MW)
- AR (150 MW)

## Wind Transmission

- Clean Line (7 GW)
- Pattern Energy (3 GW)

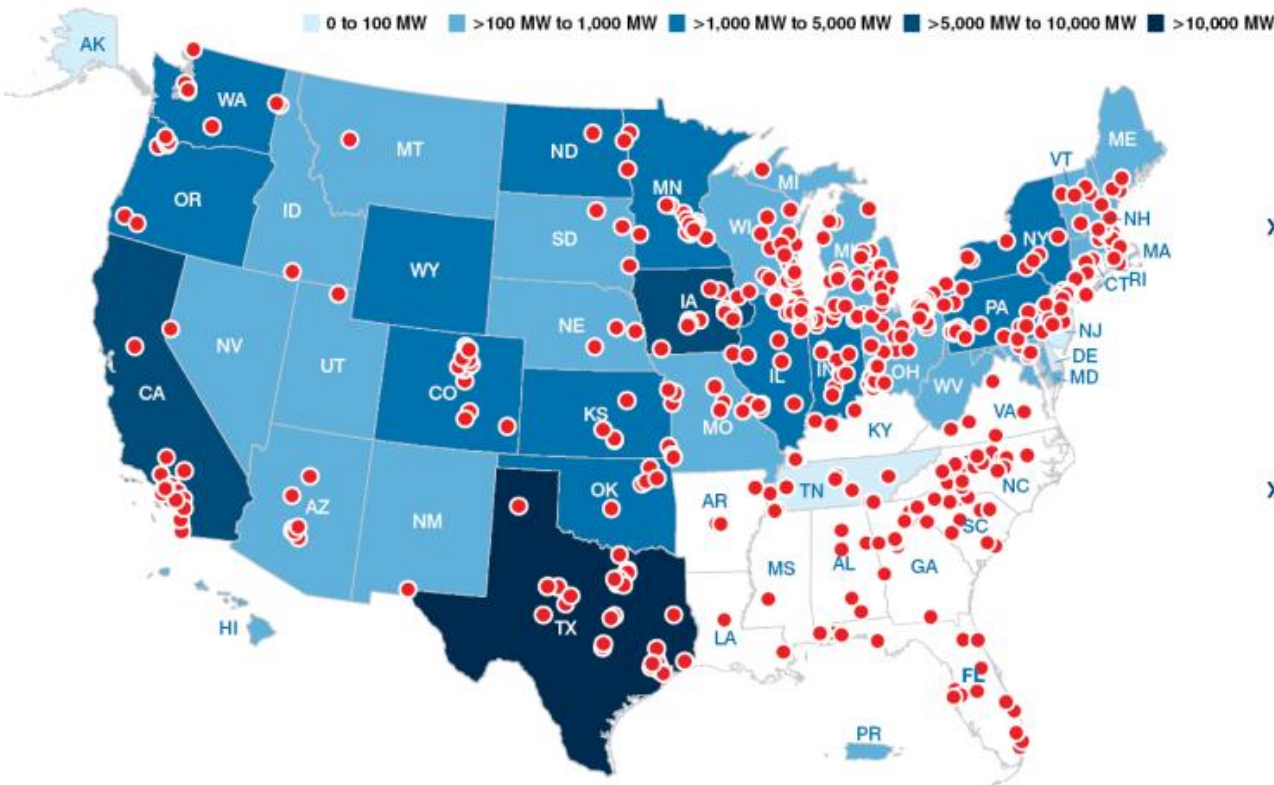
## Out of Region Wind

- TVA (1,515 MW)
- Alabama Power (404 MW)
- Georgia Power (250 MW)
- SWEPCO (LA) (469 MW)

## Offshore Wind

- *It's coming..*

# Wind Manufacturing Facilities and Industry Jobs (2012)



- 80,700 FTE in supply chain
- 25,500 jobs in manuf. sector
- 559 manuf. facilities in 44 states
- Over 150

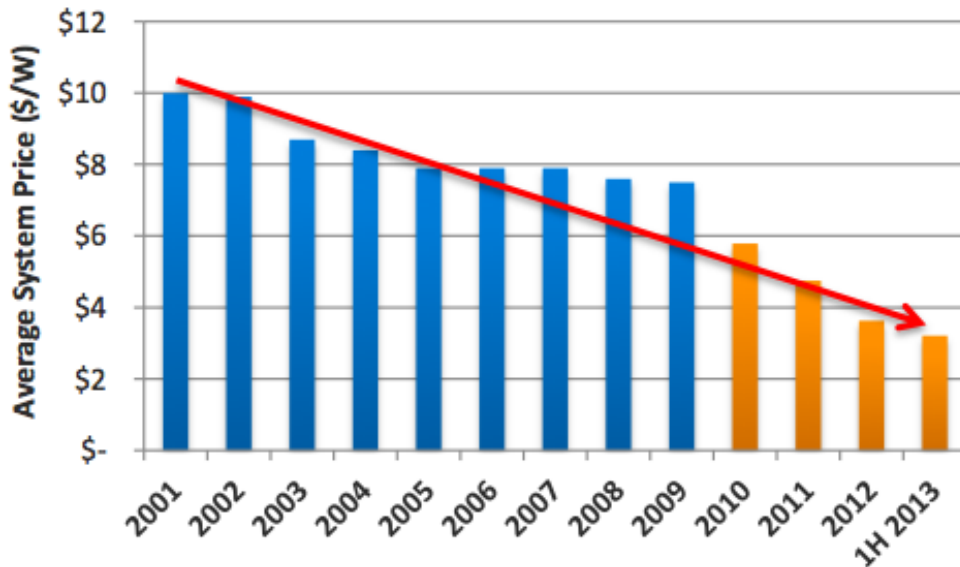
manuf. facilities  
in south

Businesses in ALL Southern states are now providing goods/services to the wind industry .

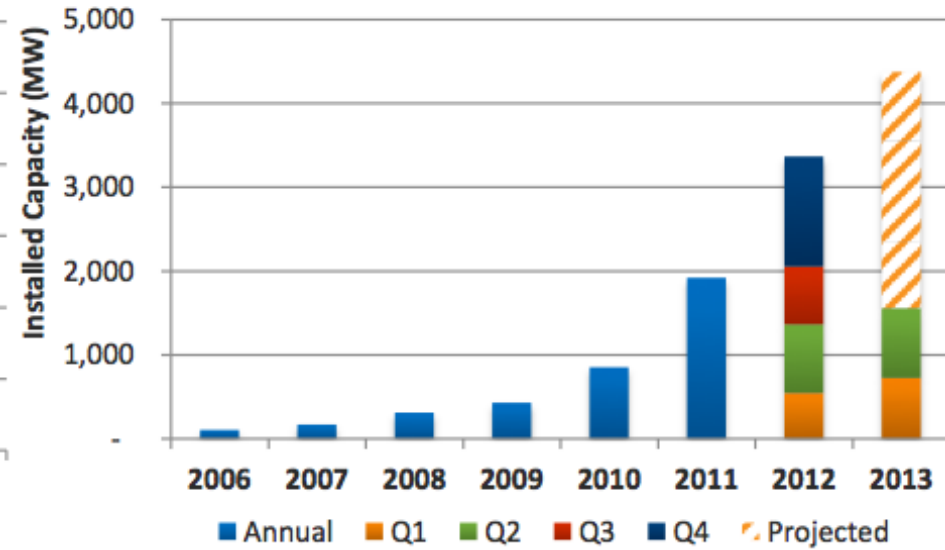


# Solar Price Drop & Capacity Rise

Average PV System Prices



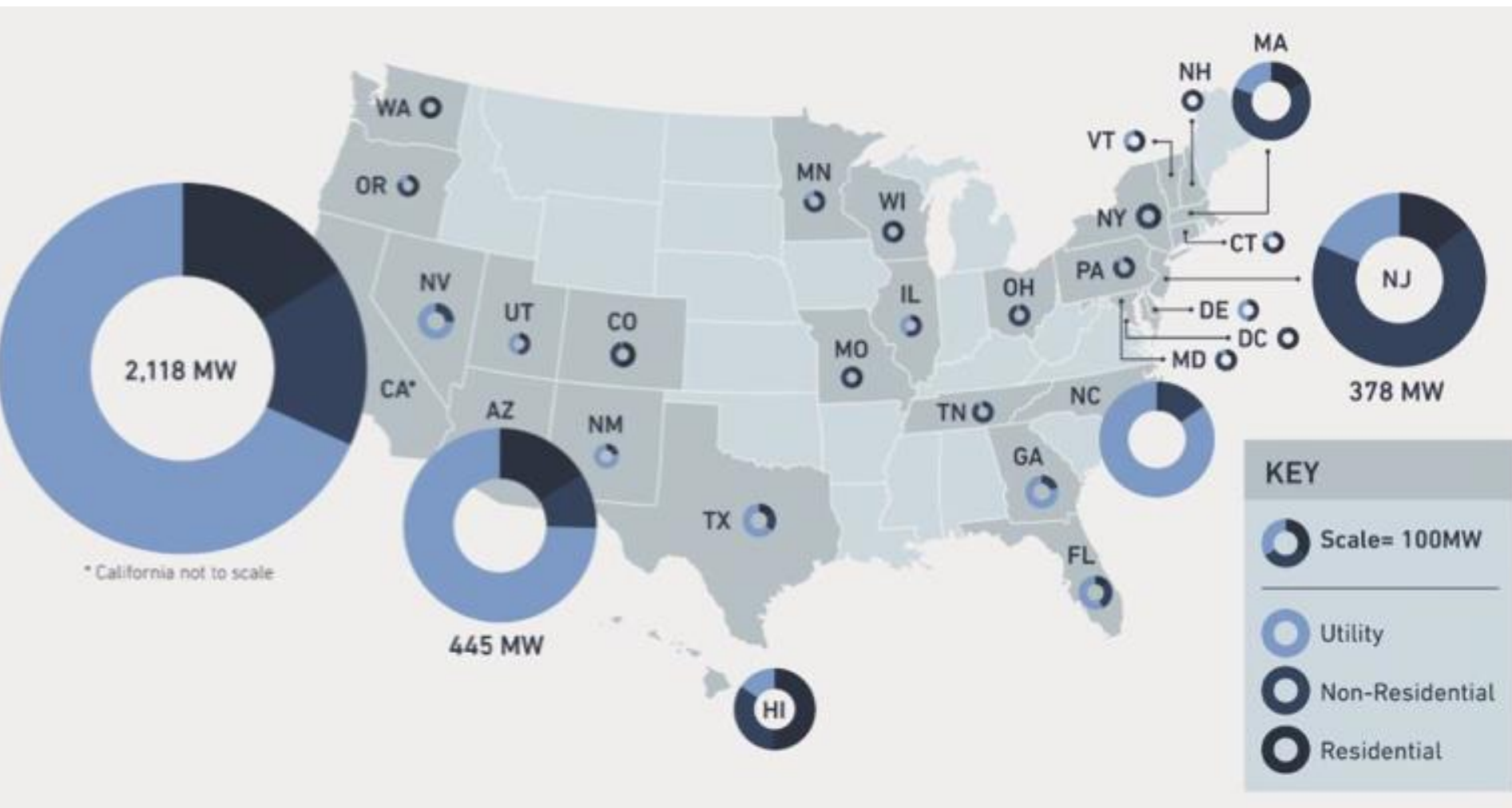
New U.S. PV Installations



Since early 2011, panel prices have dropped by 60% and average system prices have dropped by 33%

- 4,400 MW PV capacity added in 2013 (est.)
- 30% growth over 2012
- In 2012, \$11.5 billion invested in solar (\$8.6 billion in 2011)

# PV Year End 2013 Forecast (annual capacity additions)



# Solar in the SE: Current Events

## Cumulative Capacity

### 100+ MW

- NC, TX, FL

### 5 - 99 MW

- TN, GA, LA, VA

### Up to 5 MW

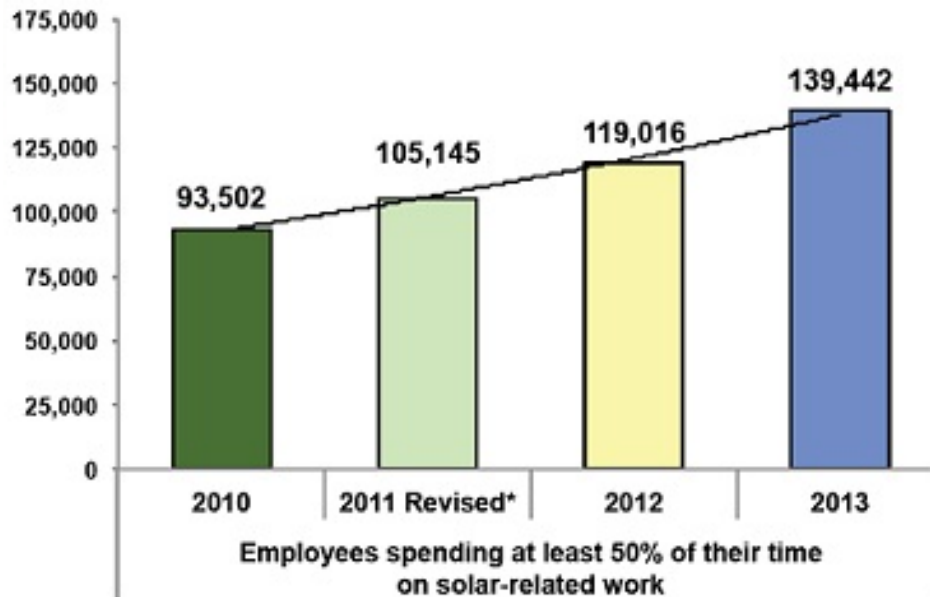
- KY, SC, WV, AR, AL, MS, OK

## Notable

- Georgia Power
  - 785 MW in pipeline
- North Carolina
  - 5<sup>th</sup> highest capacity in U.S.
- DG/Net Metering Attacks
- Value of Solar

# Solar Jobs & Economic Dev.

## National Solar Jobs



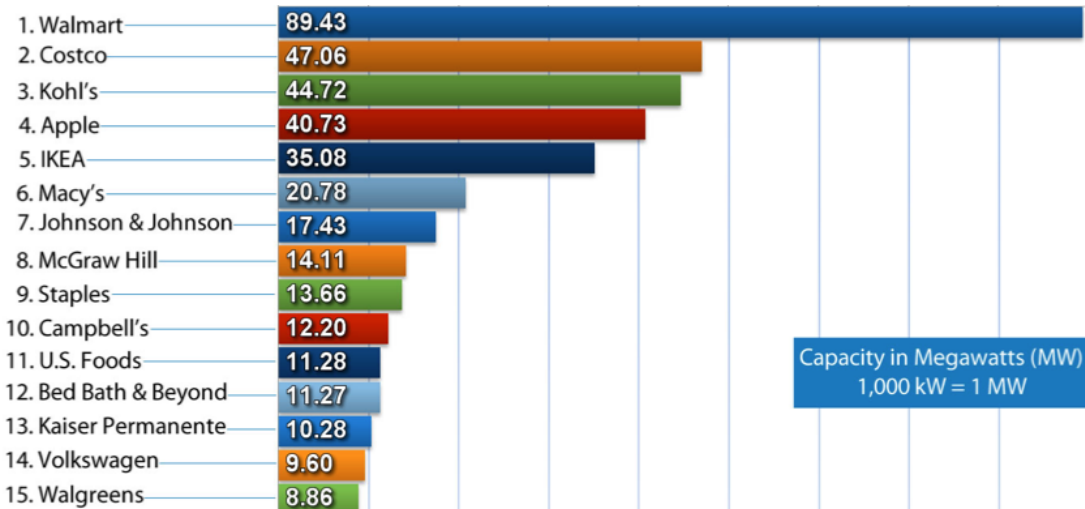
### 2013 (est.) Breakdown

- Instl – 49%
- Manfc – 23%
- Sales – 14%
- Other – 7%

## Regional Highlights

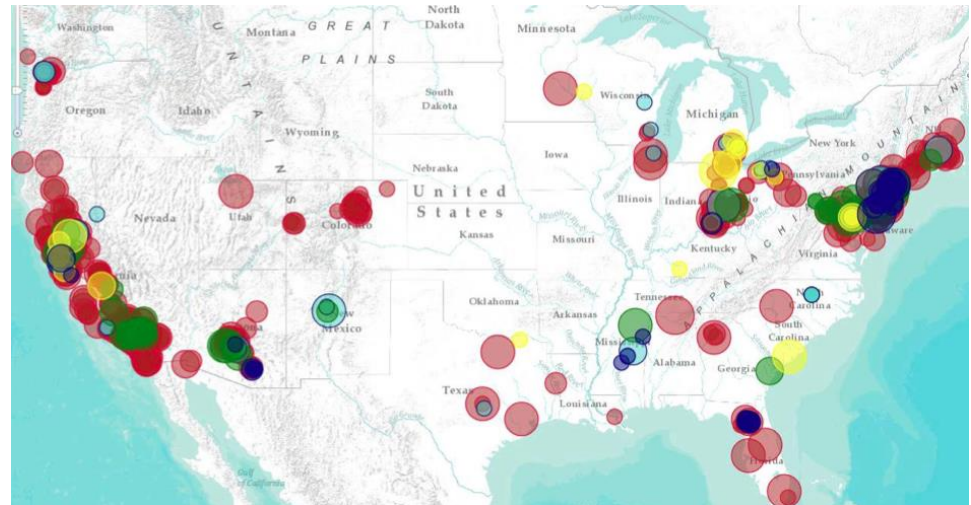
- ~13,000 solar jobs in South
- TX, FL, and TN each have 2000+ jobs
  - 2012 - each saw \$75M+ invested in home/business
- Nearly every state has over 100 solar jobs

# Companies Going Solar



3,380 MW at over  
32,800 facilities

Companies are utilizing  
solar in at least 30 states



# Conclusion

- **Renewables are catching on in the South**
- **Unlimited resource, that's good for economy and environment, AND, the Public wants it!**

*U.S. Should Place "More Emphasis" on Each Source of Domestic Energy Production, by Party ID*

Do you think that as a country, the United States should put more emphasis, less emphasis, or about the same emphasis as it does now on producing domestic energy from each of the following sources -- ?

	All Americans	Republicans	Independents	Democrats
	%	%	%	%
Solar power	76	68	74	87
Wind	71	59	68	83
Natural gas	65	78	62	59
Oil	46	71	43	29
Nuclear power	37	49	35	30
Coal	31	51	26	21

March 7-10, 2013

Gallup Poll

# Contact Us

**Thank you! Please send any further questions to:**

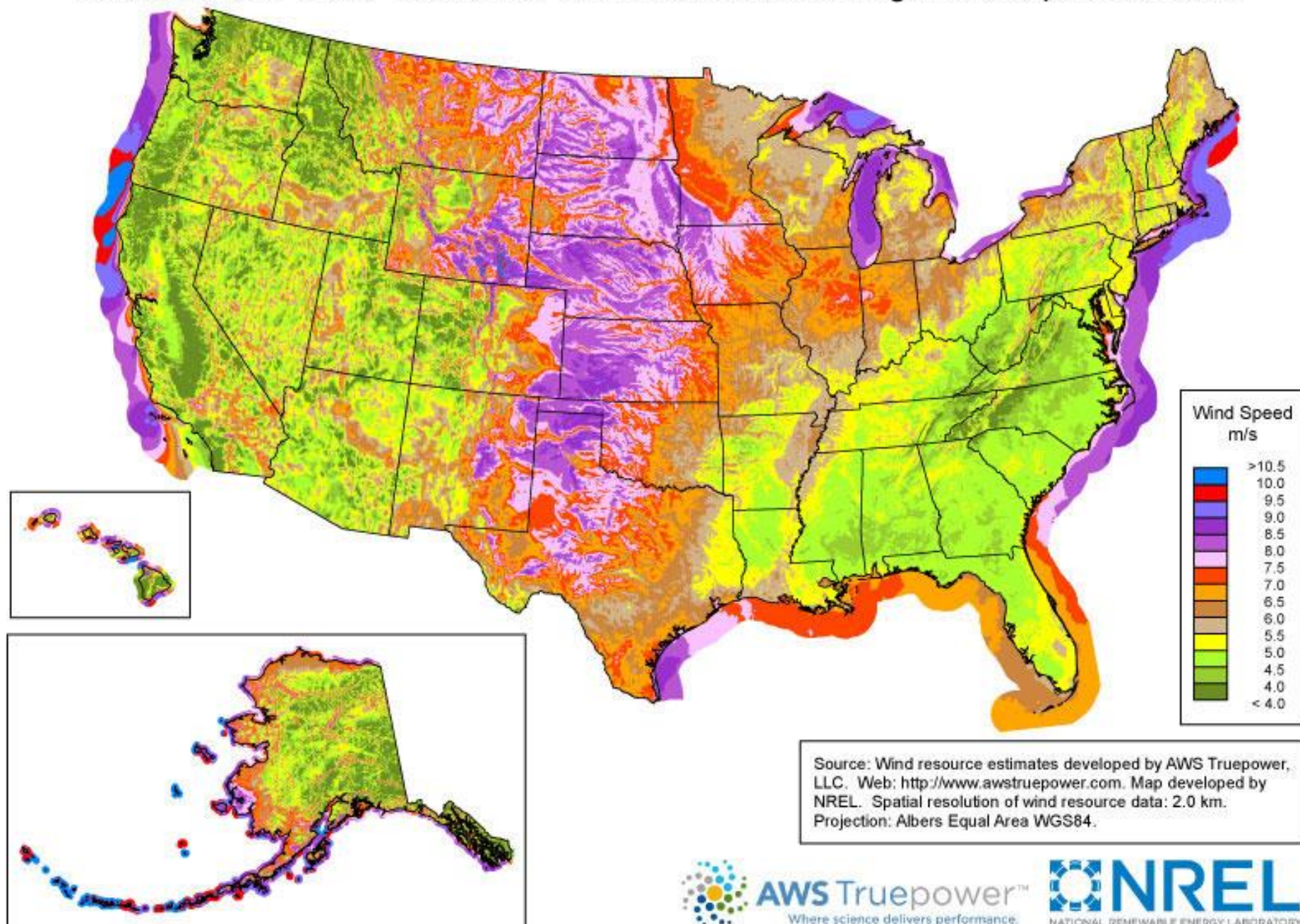
**Charlie Coggeshall**  
**Renewable Energy Manager**  
[charlie@cleanenergy.org](mailto:charlie@cleanenergy.org)

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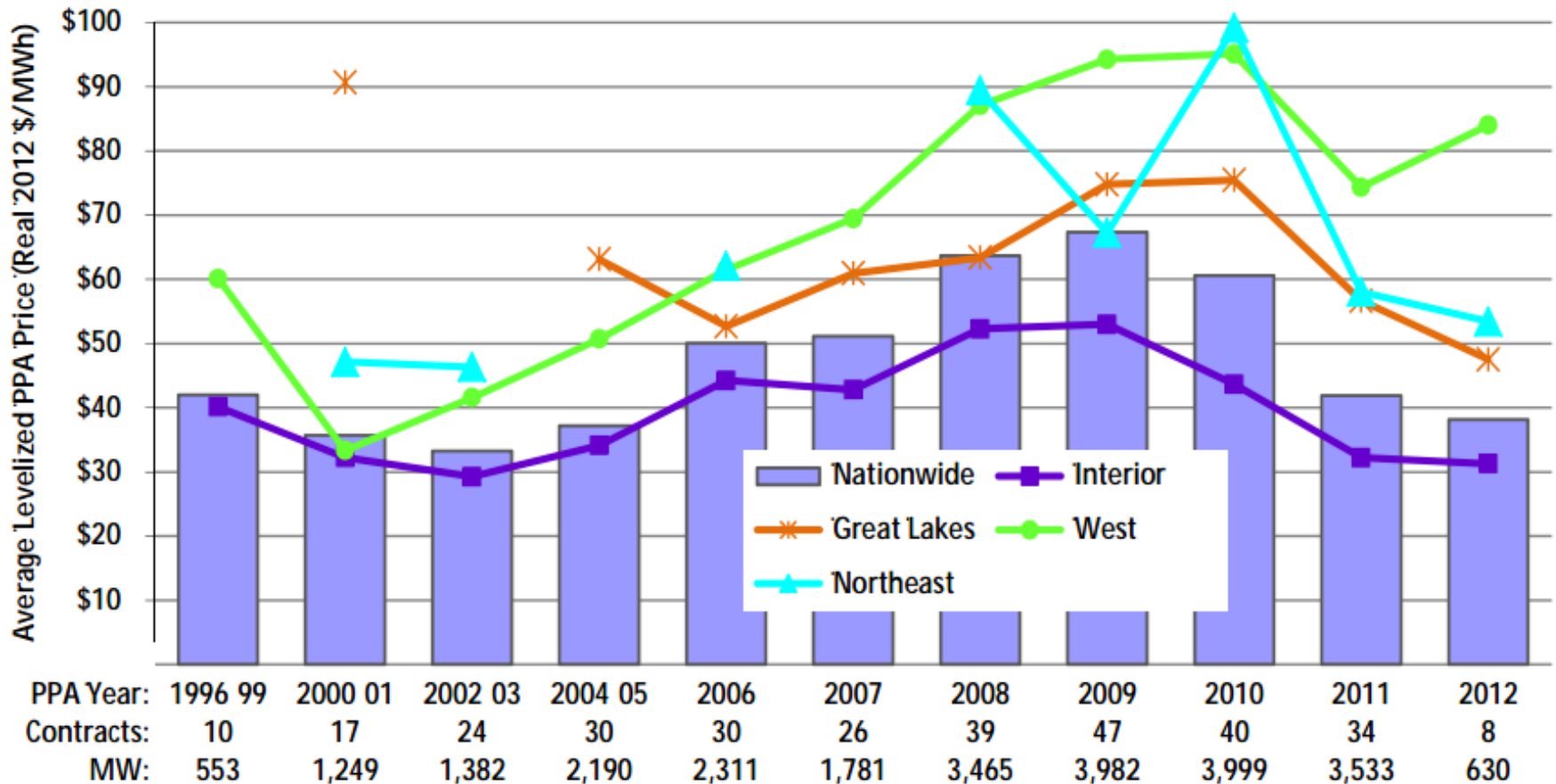


# United States - Land-Based and Offshore Annual Average Wind Speed at 80 m

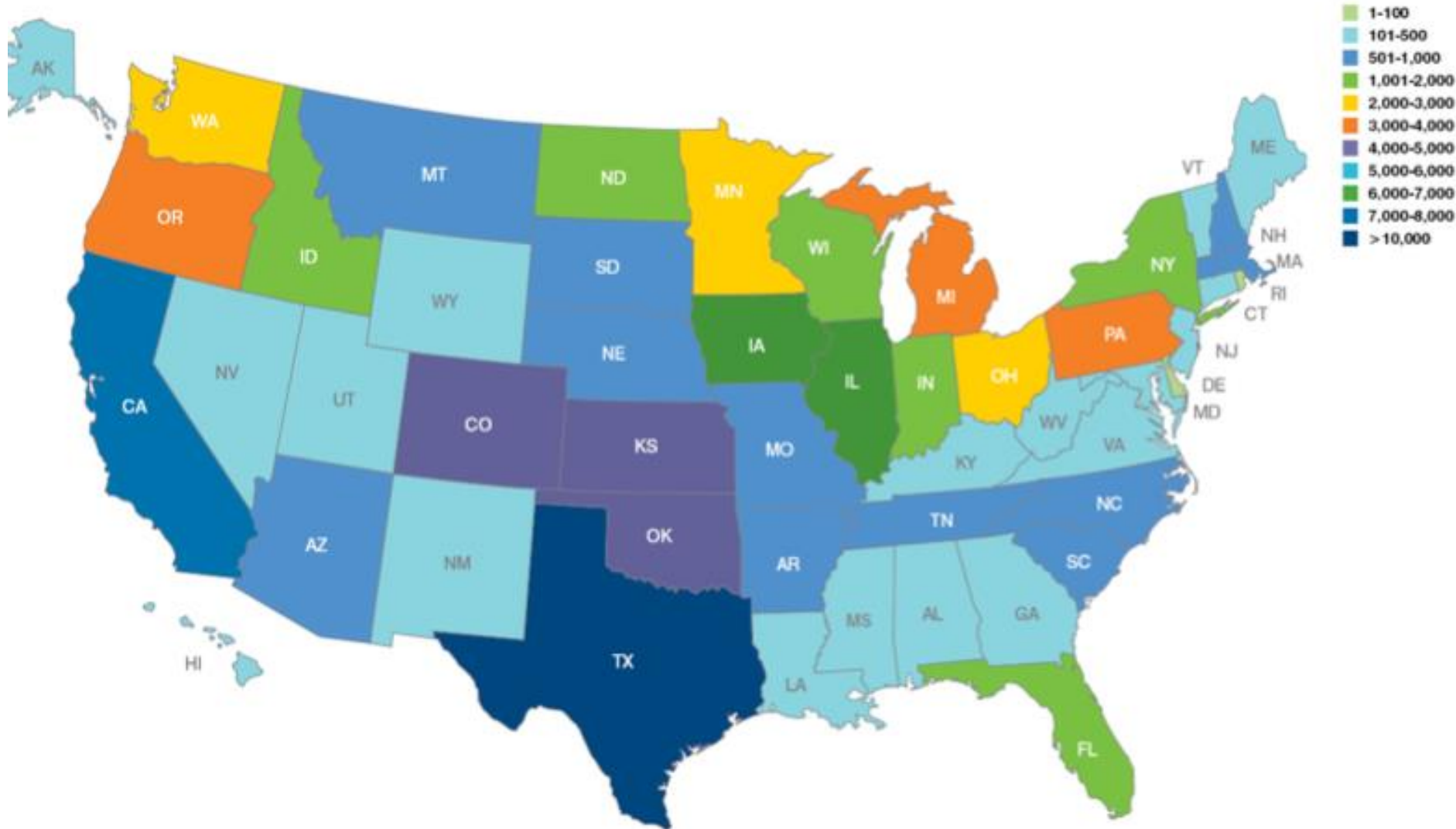




# Wind Prices

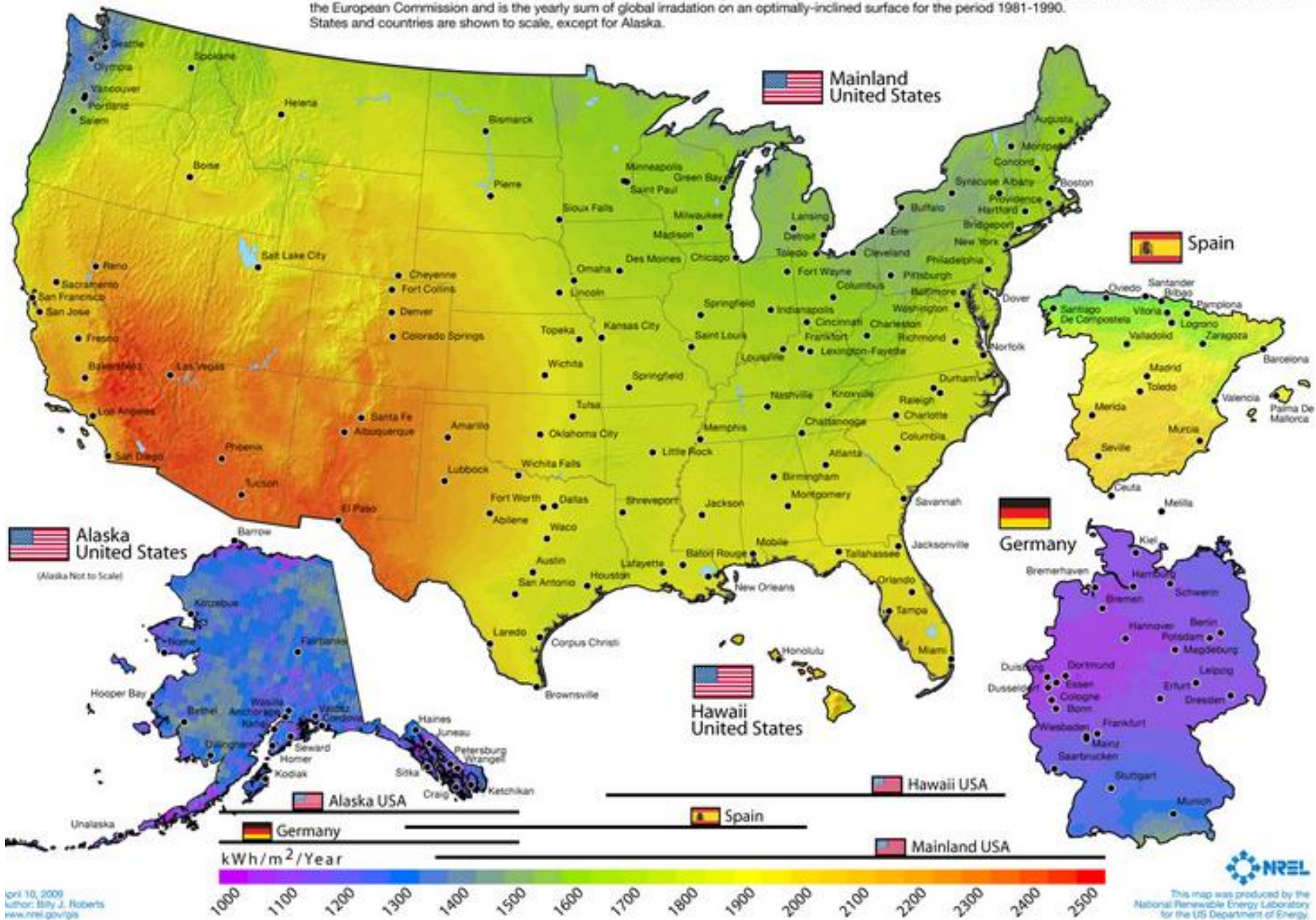


# Wind Industry Jobs



## Photovoltaic Solar Resource: United States - Spain - Germany

Annual average solar resource data are for a solar collector oriented toward the south at a tilt = local latitude. The data for Hawaii and the 48 contiguous states are derived from a model developed at SUNY/Albany using geostationary weather satellite data for the period 1998-2005. The data for Alaska are derived from a 40-km satellite and surface cloud cover database for the period 1985-1991 (NREL, 2003). The data for Germany and Spain were acquired from the Joint Research Centre of the European Commission and is the yearly sum of global irradiation on an optimally-inclined surface for the period 1981-1990. States and countries are shown to scale, except for Alaska.





# Solar Jobs (National)

<i><b>Subsector</b></i>	<i><b>2011 Jobs (Revised)</b></i>	<i><b>2012 Jobs</b></i>	<i><b>2011 - 2012 Growth Rate</b></i>	<i><b>2013 Projected Employment</b></i>	<i><b>2012 - 2013 Expected Growth Rate</b></i>
Installation	48,656	57,177	17.5%	68,931	21%
Manufacturing	37,941	29,742	(21.6%)	32,313	9%
Sales and Distribution	13,000	16,005	23.1%	19,549	22%
Project Development	--	7,988	--	9,098	14%
Other	5,548	8,105	46.1%	9,551	18%
<b>Total</b>	<b>105,145</b>	<b>119,016</b>	<b>13.2%</b>	<b>139,442</b>	<b>17%</b>

# Solar Companies







Southern Legislative  
Conference  
October 17, 2013

# Who is Silicon Ranch

- Silicon Ranch Corporation is a turnkey renewable energy provider that customizes solar solutions based upon the individual needs of its customers.
- Silicon Ranch has developed utility-scale solar Power Purchase Agreement (PPA) projects on sites we own or lease, behind-the-meter projects serving Fortune 500 companies, and host agreements on sensitive sites, including data centers.
- Silicon Ranch's value to its customers is its ability to develop and execute solar solutions that help companies build brand equity, hedge future increases in the cost of electricity, and pursue a socially responsible community benefit while allowing those companies to focus on their core business activities.



# Assisting Companies Accomplish their Sustainability Goals





# **Volkswagen Case Study**



# VW Chooses Tennessee

- July 15, 2008, CEO of Volkswagen of America Stefan Jacoby and Tennessee Governor Phil Bredesen announce VW's decision to invest \$1 billion to build a new, state of the art, manufacturing & assembly plant in Chattanooga.
- VW cites Chattanooga's dramatic redevelopment with a strategic focus on environmental sustainability as one reason for the location decision.
- VW states that the Chattanooga plant will be the most environmentally friendly auto manufacturing and assembly plant in the world.





# VW's Focus on Sustainability



- VW chooses a brownfield site that had previously been a munitions factory.
- Manufacturing site bordered by a nature reserve.
- Two new trees are planted throughout the city for each tree removed at the site.
- Plant is designed to achieve Platinum LEED Certification.

# VW's seeks LEED Platinum

*“Volkswagen Chattanooga’s LEED Platinum certification is the fulfillment of a promise that Volkswagen has made around the world and in this community that we will work in harmony with the environment,” said Frank Fischer, CEO and chairman of Volkswagen Chattanooga.*

- The ultra-clean paint shop alone will save 50 million gallons of water in ten years.
- Superior insulation provided by six inches of mineral rock wool, resulting in 720,000 Kilowatts per year savings.
- Use of LED lighting on the exterior results in 68% less energy used, up to 262,500 kWh per year and a reduction in light pollution.
- Rainwater collected and reused to flush toilets and cool the welding machines.
- White roof membrane is highly reflective, minimizing heat island effect by up to 50 degrees Fahrenheit.
- Natural flowing creeks to capture heavy rains and restore a natural habitat.
- Low-flow water fixtures and no-touch sensors throughout the plant reduce water usage by 30%.
- Plant was built on a brownfield property with no destruction of untouched nature. Protected 100 ft. wide creeks and wetlands were established to create natural habitats with low impact on natural habitats.

# Renewable Energy Challenge

- VW's efforts to reach Platinum LEED certification required that VW obtain at least 12.5% of their power from onsite generated renewable energy.
- VW spent two years considering various options to reach the goal.
- Most difficult obstacle was no established utility program existed to assist with such a large amount of renewable energy generation.
- VW is inside the TVA service territory which has certain statutory protections.
- VW reaches out to Silicon Ranch to assist in developing a successful option.





# Renewable Energy Challenge

- Silicon Ranch works with TVA and local distributor to attempt to tailor a fit into existing renewable energy programs.
- The size of the renewable energy requirement is too large to make the approach practical.
- Silicon Ranch proposes a “behind the meter” solar farm and works with VW’s LEED consultants, TVA and local electricity distributor to develop the concept.
- VW performs due diligence on the project concept, Silicon Ranch and VW enter into long term PPA and land lease.



# VW Chattanooga Solar Farm



- 9.5-megawatt photovoltaic solar system built in 2012 provides 13.5 gigawatts hours of electricity annually to VW's Chattanooga manufacturing and assembly plant.
- The ground mounted solar installation covers approximately 33 acres and uses over 33,000 solar panels.
- VW's Chattanooga assembly plant is the first and only LEED® Platinum automotive manufacturing plant in the world to be certified by the U.S. Green Building Council.



## Building an Environmentally Friendly Automobile in a LEED Platinum Factory



- Volkswagen Chattanooga produces the all-new 2012 Passat, which was named Motor Trend magazine's 2012 Car of the Year, as well as having earned the Insurance Institute for Highway Safety's (IIHS) Top Safety Pick rating, the highest possible from the non-profit safety research organization.
- The Passat TDI – the only clean diesel option in the midsize segment – is rated at 43 mpg highway, with a range of nearly 800 miles.



# The Georgia Experience



# Georgia Strategy

- Deploying traditional economic development incentives Georgia recruits a large solar panel manufacturer and commercializes technology out of Georgia Tech to site a second large panel manufacturer in the state.
  - Mage and Suniva
- Recognizes need to create an instate market in order to develop the solar value chain.
- Public Service Commission directs Georgia Power to acquire 50 MW of solar generated electricity.

# Georgia Strategy

- Georgia Power awards two large scale projects to pilot solar deployment.
- Pricing is based on perceived capacity and procurement costs.
- Negotiates and signs Power Purchase Agreements for the 50 MW projects.
- Uses its experience from the pilot program to structure a sustainable solar program for use in the state.
- Announces 3 year, 210 MW commercial and utility scale solar procurement.
- PSC mandates an additional 250 MW of solar in Georgia Power's Integrated Resource Plan.



# Simon Solar



May 10<sup>th</sup>, 2013



June 12<sup>th</sup>, 2013



July 10<sup>th</sup>, 2013



August 13<sup>th</sup>, 2013



September 10<sup>th</sup>, 2013



October 8<sup>th</sup>, 2013

# Considerations

- State and local policies need to support solar transactions-Power Purchase Agreements, Zoning, Permitting and State and Local tax policy.
- It takes the same amount of work to develop and interconnect a small project as a large project.
- Significant amount of services required to develop an opportunity.
- Lots of legal documents – development of local expertise.
- Needs for local banking relationships – understanding these transactions.
- Growth of installation and maintenance jobs – workforce training opportunities.



**Good Policy  
Good Business  
Good Outcomes**



# Sustainability is Good Business

- “High sustainability” companies significantly outperformed their counterparts over an 18-year period in terms of both stock market and accounting criteria, such as return on assets and return on equity.<sup>2</sup>
- In terms of stock market returns, the “high sustainability” companies had an abnormal stock market performance that was 4.8% higher than the “low sustainability” companies on a value-weighted basis.
- They also exhibited lower performance volatility.
- More and more companies are exploring how environmental, social and governance performance can contribute to financial performance.

*How to Become a Sustainable Company, Robert G. Eccles, Kathleen Miller Perkins and George Serafeim, MIT Sloan Management Review*

2. R.G. Eccles, I. Ioannou and G. Serafeim, “The Impact of a Corporate Culture of Sustainability on Corporate Behavior and Performance,” working paper 17950, National Bureau of Economic Research Working Paper Series, Cambridge, Massachusetts, March 2012,

# Trends Favor Solar

- Solar has reached grid parity in many markets (Credit Suisse, Jan. 2013)
- Now offers compelling economics (Credit Suisse, Jan. 2013)
- Could solar be cheaper than natural gas? ..Sooner than you think.  
“It’s not difficult to envision a future with higher natural gas prices or additional environmental regulations, especially given the environmental regulations currently tied up in the courts.” (Solar Industry Mag, Jan. 2013)
- Companies increasingly consider sustainability in deciding where to locate and expand.
- Consumers becoming more aware of brand sustainability efforts and consider this in making purchasing decisions.





# Objectives of a Solar Strategy

- Opportunity to grow capital investment and jobs.
- Larger Scale projects are more cost efficient at “moving the needle” than small homeowner installations that typically require much higher incentives.
- Best way to drive down cost is with commercial and utility scale projects.
- Creative ways to assist your local industry with their sustainability objectives.
- Requires partnership with the utility company.



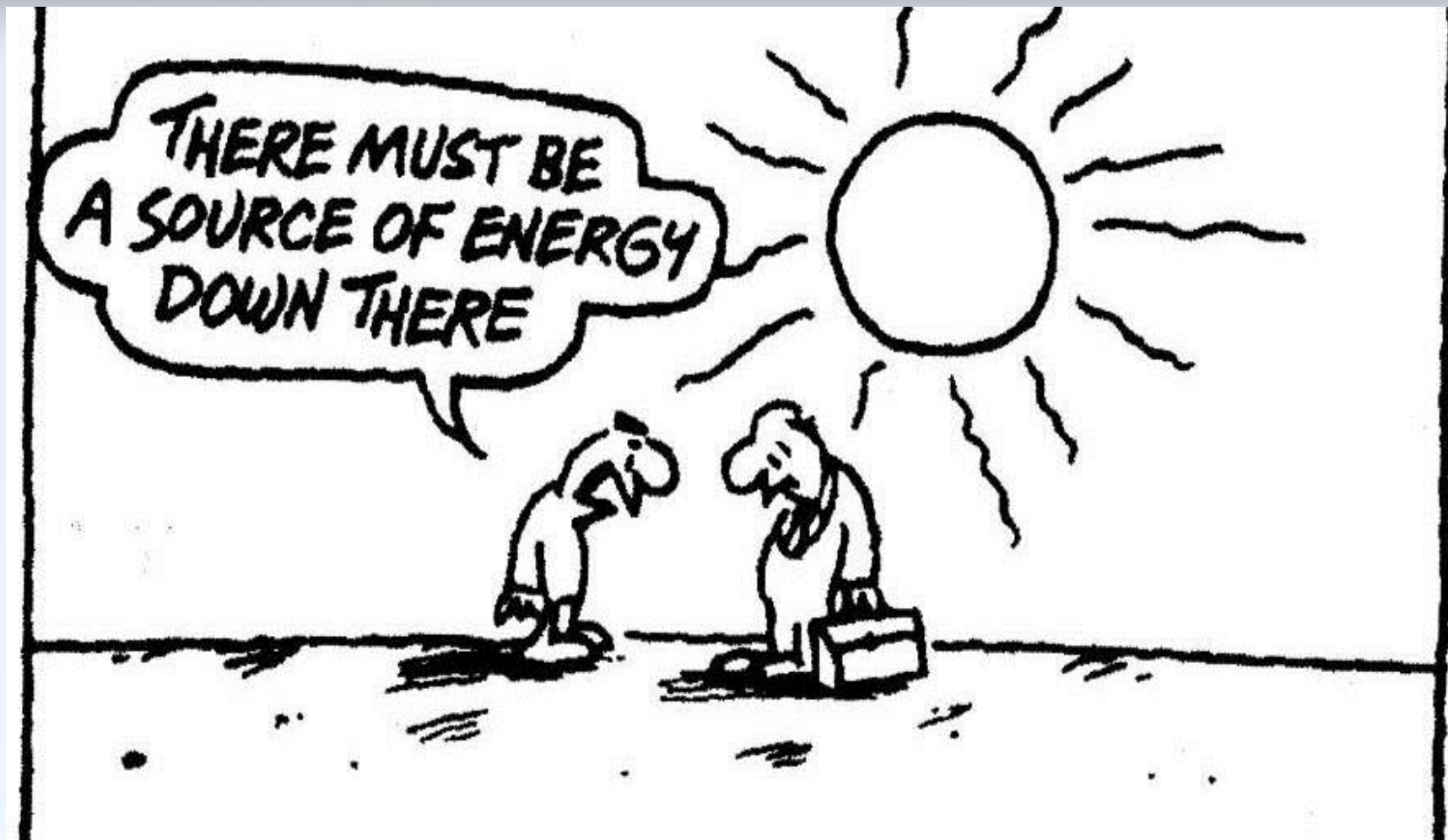
# Policy Considerations

- “When you see one solar deal you have seen one solar deal.”
- State and Local policy must support solar strategy.
- Access—Companies should not be prohibited from entering into Power Purchase Agreements for onsite generation.
- Property Tax—State should provide uniform guidance for how solar should be taxed at the local level.
- Challenges exist with interpretations for zoning, permitting, and fees varying among localities.

# **Additional Information**



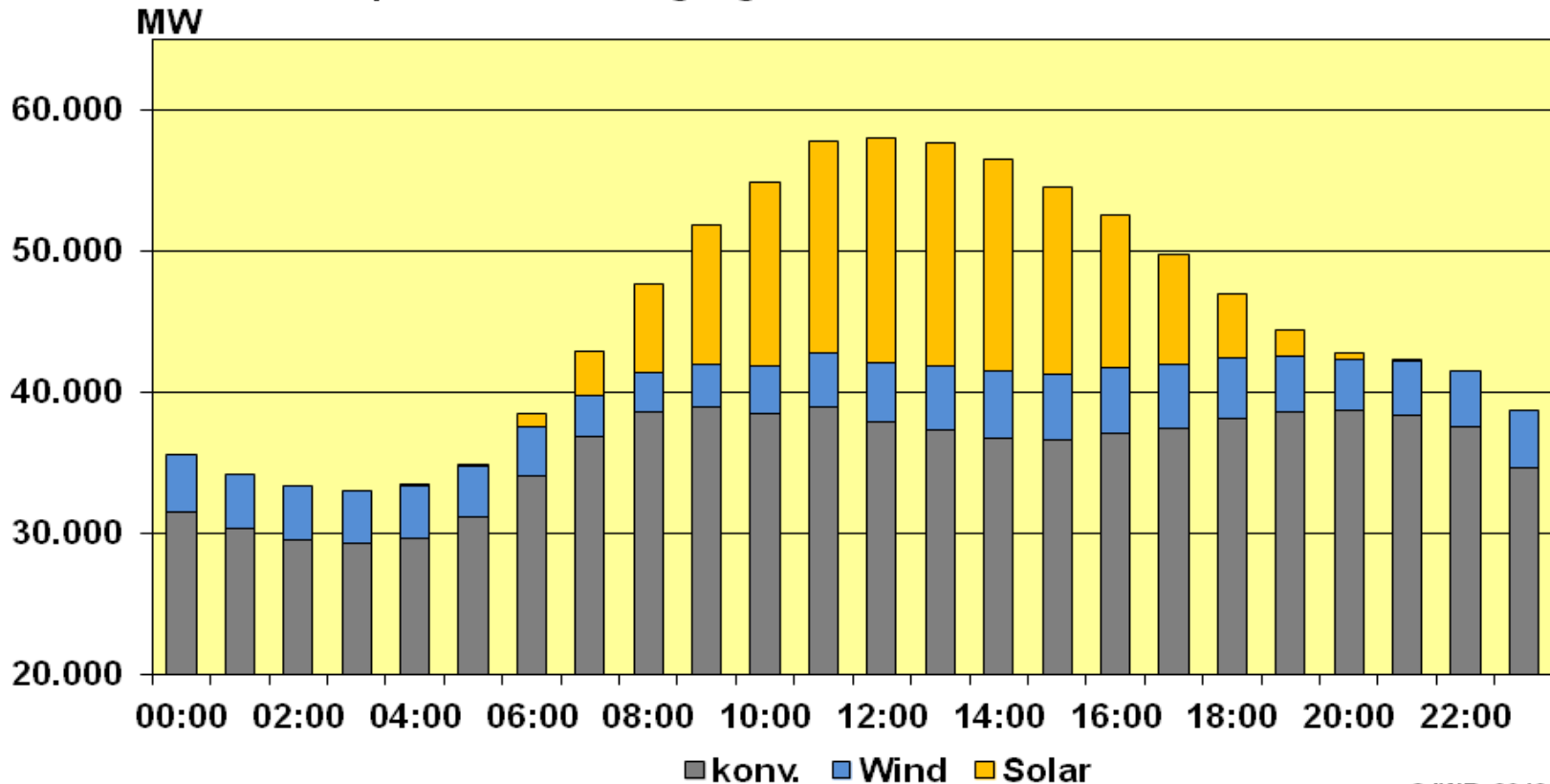






# Load Profile in Germany May 2012

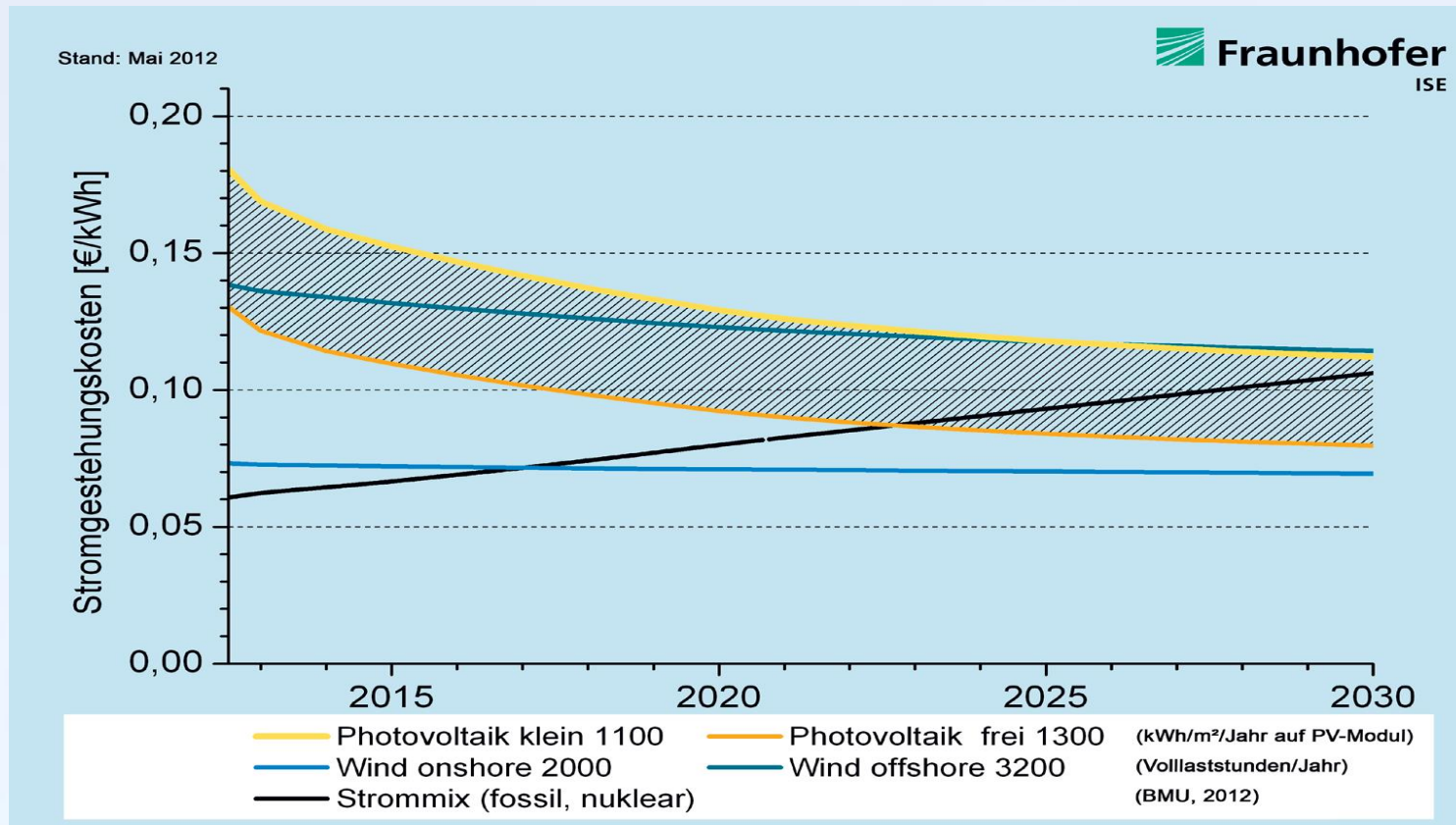
Lastprofil Stromerzeugung in Deutschland im Mai 2012



Quelle: IWR, Daten: IWR, Amprion, Tennet, Transnet BW, 50 Hertz

© IWR, 2012

# The Time is Right





Silicon Ranch Corporation  
150 3<sup>rd</sup> Avenue South, Suite  
2000  
Nashville, TN 37201  
615-577-4686  
[www.siliconranchcorp.com](http://www.siliconranchcorp.com)

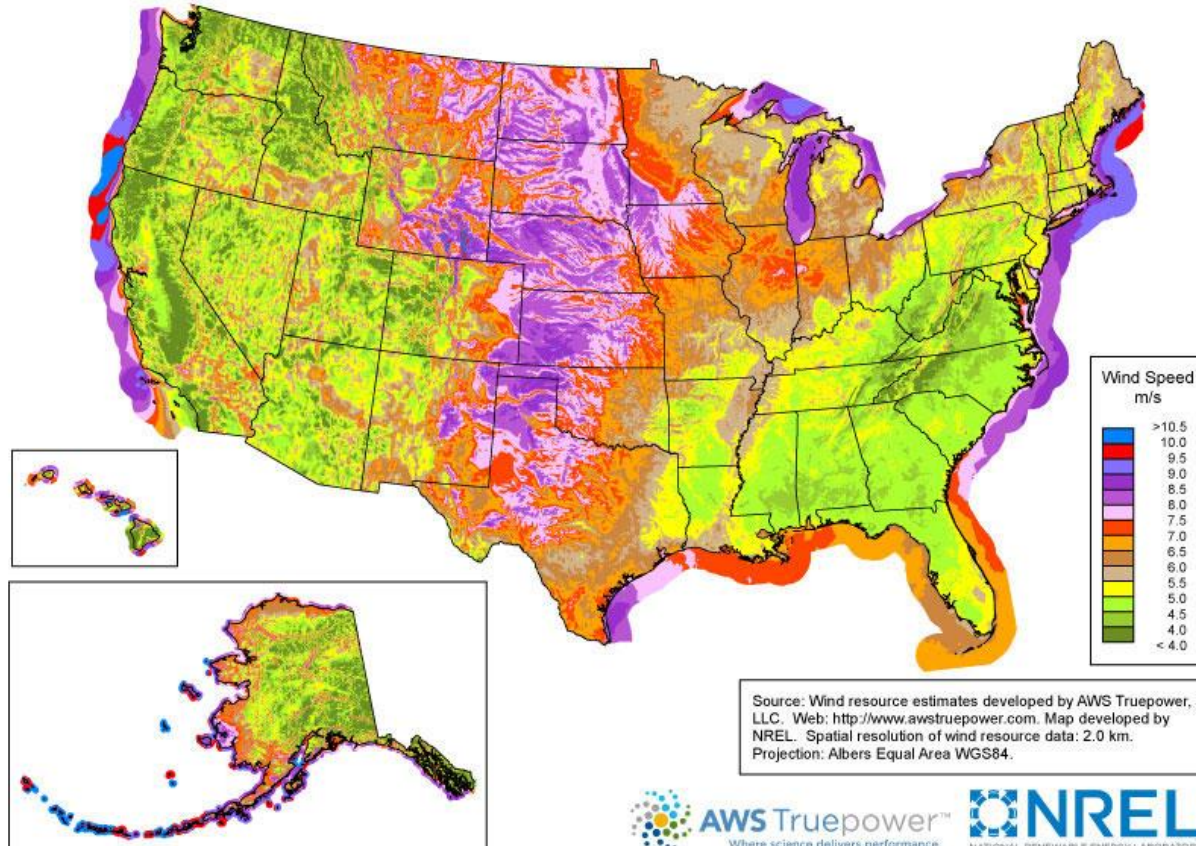
# Wind Energy in Oklahoma





# Wind Resources

United States - Land-Based and Offshore Annual Average Wind Speed at 80 m



# Wind Resources

- ◉ Installed wind capacity: 3,134 MW
- ◉ Oklahoma's wind generation capacity grew by 50% in 2012
- ◉ Estimated potential: 516,822 MW, or 30 times the state's current electricity needs
- ◉ In the works: 700-mile transmission line by Clean Line Energy Partners

# Economic Impact

- Employs 2,000-5,000
- Ad valorem taxes, royalty payments
- Examples

# Policy

- “Oklahoma’s natural resources and the leadership of lawmakers have made it an ideal state for wind-energy investment. [The state’s] thoughtful policies have helped encourage development of a resource that is mutually beneficial to ratepayers, local communities and the environment.”  
—TradeWind CEO Rob Freeman



# Policy

- Oklahoma Wind Energy Development Act (HB 2973 2010)
- Zero-emissions facility credit
- Investment/new jobs tax credit
- Five-year ad valorem tax exemption

# Policy

- Oklahoma Energy Security Act
  - 2010 HB 3028
  - 15% renewable energy target by 2015
  - 2012 – 17.27%

# Contact

**Tricia Dameron**

GIS Coordinator/Research Analyst  
Oklahoma House of Representatives  
[Tricia.dameron@okhouse.gov](mailto:Tricia.dameron@okhouse.gov)

