

# Wind Energy in Nebraska

## Municipal Utility Wind Projects

August 26, 2009



**Nebraska Public Power District**

*"Always there when you need us"*

# Wind Energy In Nebraska



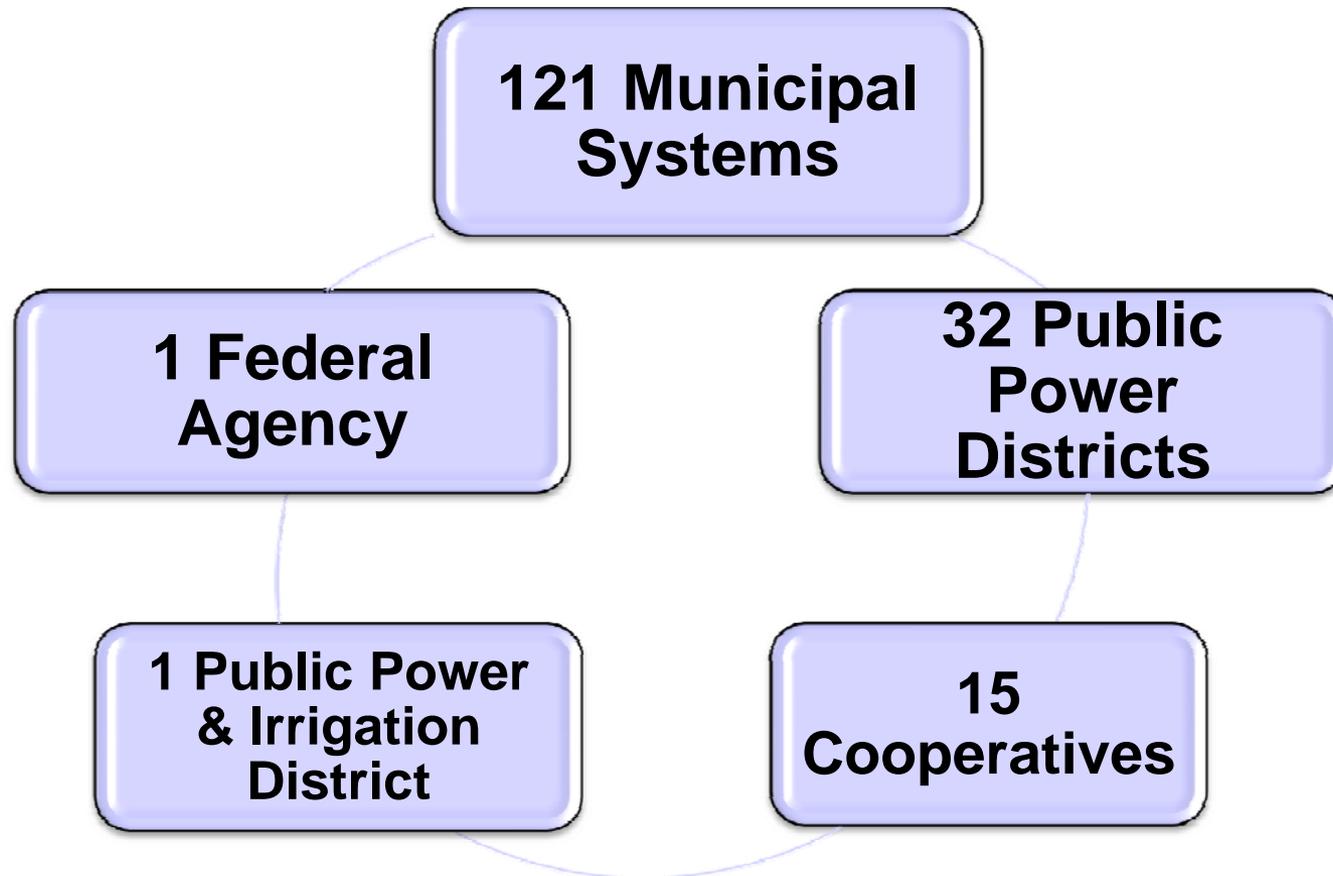
- Nebraska's public power system and NPPD
- Wind development in the state
- Incentives and laws
- What NPPD is doing

# Public Power System in Nebraska



- Unique:
  - Only state in the nation served entirely by publicly-owned electric utilities
  - Public Power District Statutes
    - 1933
  - Bought the Investor Owned Utilities (IOU)
- Municipal electric systems date back to 1880's

# Nebraska's Public Power Structure

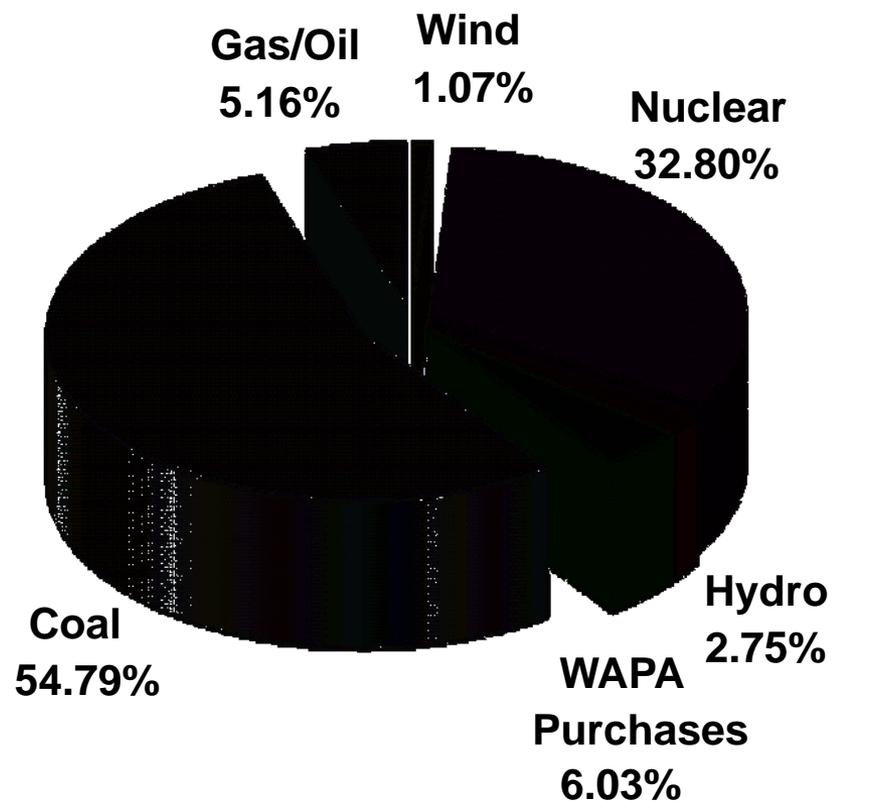


# Public Power System in Nebraska<sub>(Cont'd)</sub>



- NPPD provides almost half the electricity consumed in Nebraska
- Low-Cost:
  - Electric rates in Nebraska are 5<sup>th</sup> lowest in America
  - 9.81 ¢ National average
  - 6.51 ¢ Nebraska
- Average Firm Wholesale
  - 4.16 cents/kWh

# NPPD's Generation Mix - 2008



40% are non-carbon emitting resources

- Coal is a low-cost fuel
- Nuclear holds great potential for the U.S.
- NPPD has strategic goal to generate 10% from renewable resources by 2020

# Potential Wind Development



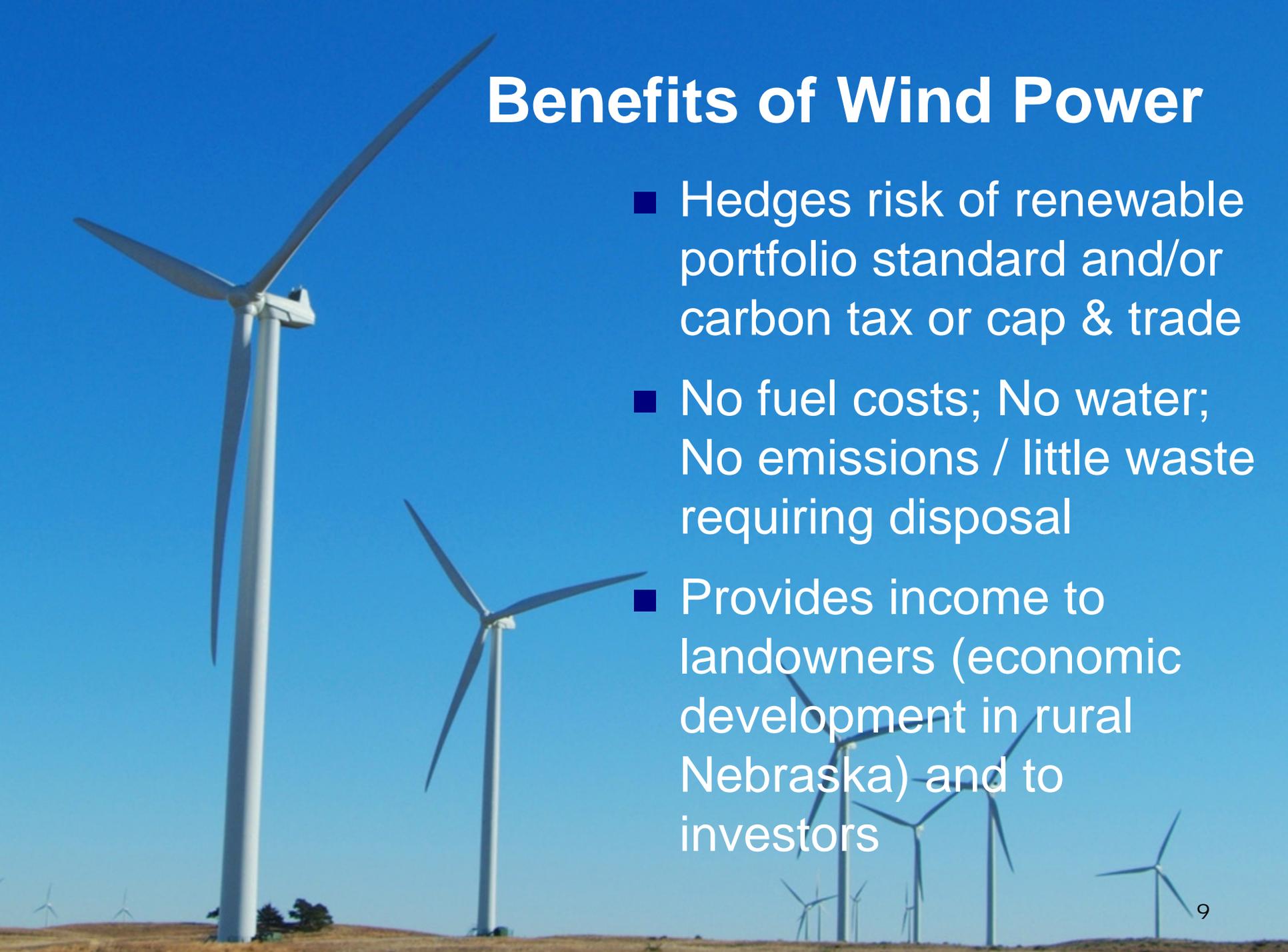
- A great opportunity for Nebraska
- Nebraska has the 6<sup>th</sup> greatest potential for wind energy in the U.S.
- The U.S. leads the world in installed wind capacity
  - U.S. – 26,274 MW
  - Nebraska – 152 MW

# State Wind Resource Potential

(Billions of kWh)

1.	North Dakota	1210	11.	Colorado	481
2.	Texas	1190	12.	New Mexico	435
3.	Kansas	1070	13.	Idaho	73
4.	South Dakota	1030	14.	Michigan	65
5.	Montana	1020	15.	New York	62
6.	Nebraska	868	16.	Illinois	61
7.	Wyoming	747	17.	California	59
8.	Oklahoma	725	18.	Wisconsin	58
9.	Minnesota	657	19.	Maine	56
10.	Iowa	551	20.	Missouri	52

- Data: Pacific Northwest Laboratories

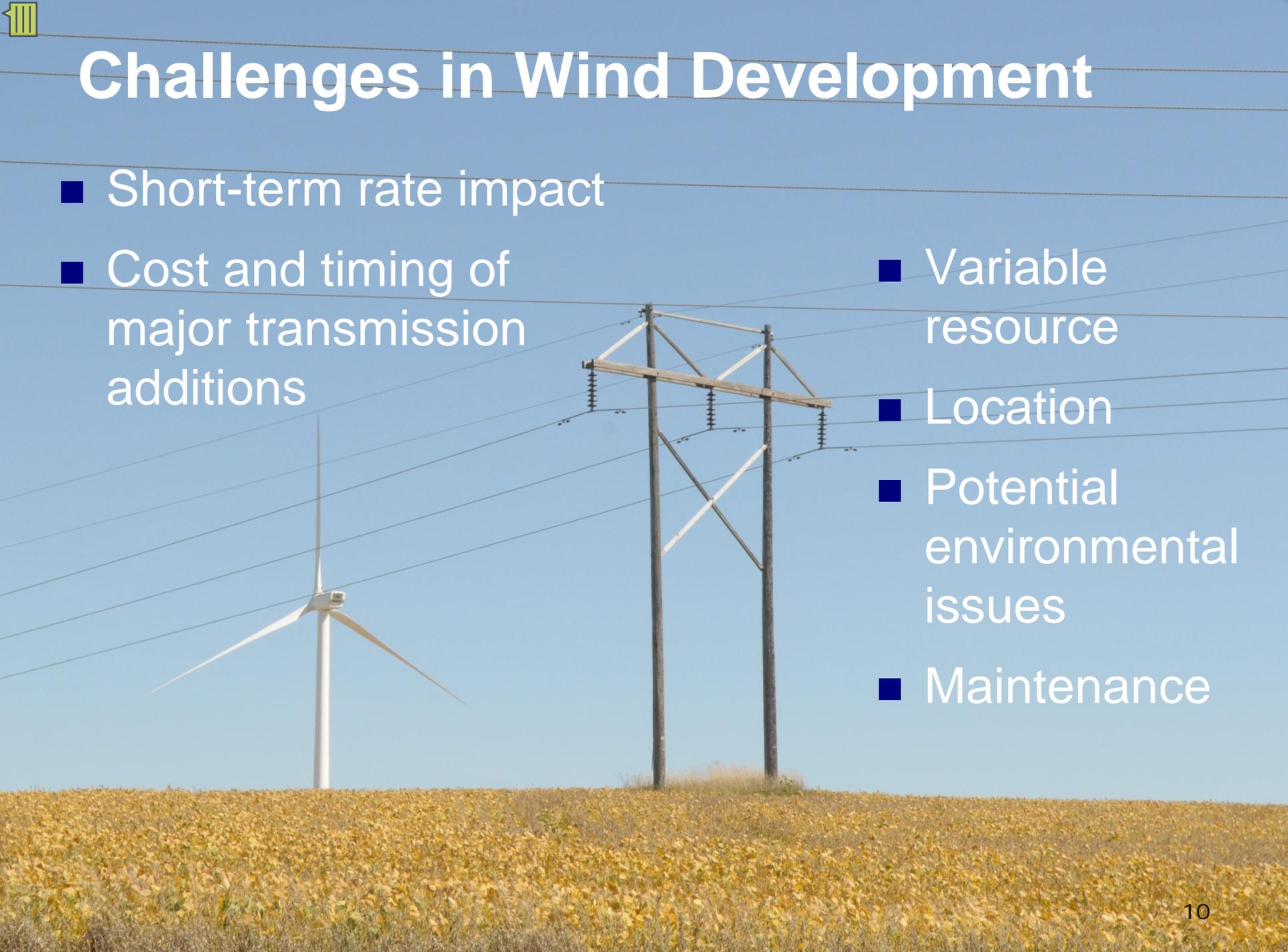


# Benefits of Wind Power

- Hedges risk of renewable portfolio standard and/or carbon tax or cap & trade
- No fuel costs; No water; No emissions / little waste requiring disposal
- Provides income to landowners (economic development in rural Nebraska) and to investors



# Challenges in Wind Development

- Short-term rate impact
  - Cost and timing of major transmission additions
  - Variable resource
  - Location
  - Potential environmental issues
  - Maintenance
- 



# Technology Changes



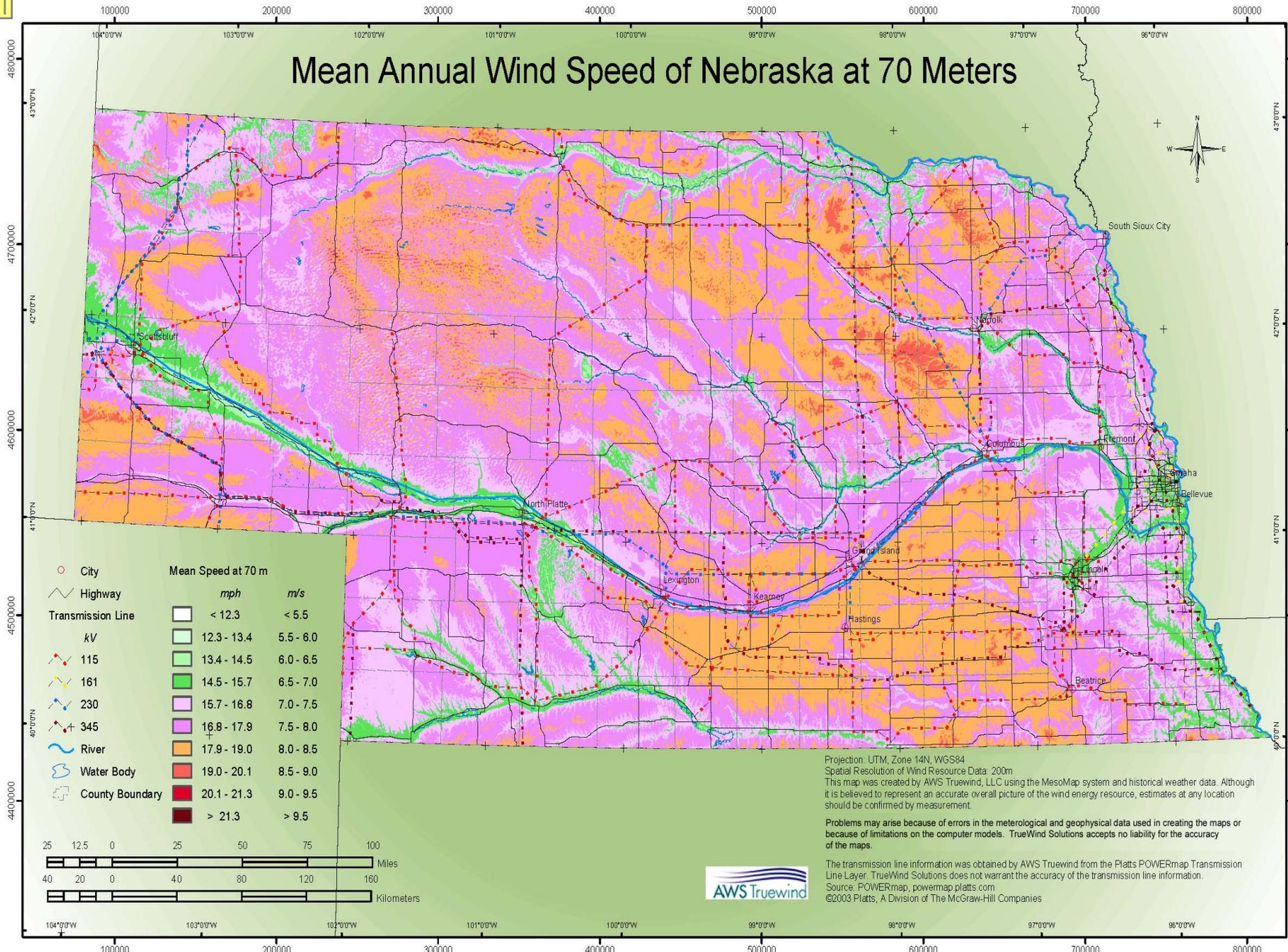


# What is Needed



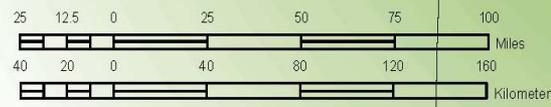


# Mean Annual Wind Speed of Nebraska at 70 Meters



Mean Speed at 70 m		
	mph	m/s
	< 12.3	< 5.5
	12.3 - 13.4	5.5 - 6.0
	13.4 - 14.5	6.0 - 6.5
	14.5 - 15.7	6.5 - 7.0
	15.7 - 16.8	7.0 - 7.5
	16.8 - 17.9	7.5 - 8.0
	17.9 - 19.0	8.0 - 8.5
	19.0 - 20.1	8.5 - 9.0
	20.1 - 21.3	9.0 - 9.5
	> 21.3	> 9.5

- City
- Highway
- Transmission Line**
- 115 kV
- 161 kV
- 230 kV
- 345 kV
- River
- Water Body
- County Boundary



Projection: UTM, Zone 14N, WGS84  
 Spatial Resolution of Wind Resource Data: 200m  
 This map was created by AWS Truewind, LLC using the MesoMap system and historical weather data. Although it is believed to represent an accurate overall picture of the wind energy resource, estimates at any location should be confirmed by measurement.

Problems may arise because of errors in the meteorological and geophysical data used in creating the maps or because of limitations on the computer models. TrueWind Solutions accepts no liability for the accuracy of the maps.

The transmission line information was obtained by AWS Truewind from the Platts POWERmap Transmission Line Layer. TrueWind Solutions does not warrant the accuracy of the transmission line information.  
 Source: POWERmap, powermap.platts.com  
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# NPPD's History with Wind Power



- Springview - 1998
- Ainsworth – Oct. 2005
- Project Proposals Sought – July 2007
- Bloomfield – Feb. 2009
- Crofton - TBD
- 2<sup>nd</sup> Round of Project Proposals – Nov. 2008
- Announcement this fall

# Wind Facilities In Nebraska

Owned by	Location	Year Installed	Size	2008 Capacity Factor
LES	Lincoln	1999	1.3MW	25%
OPPD	Valley	2001	.7MW	22%
MEAN	Kimball <sup>(1)</sup>	2002	10.5MW	34%
NPPD	Ainsworth <sup>(2)</sup>	2005	59.4MW	35%
ERW	Bloomfield <sup>(3)</sup>	2009	80MW	---%
<b>TOTAL</b>			<b>151.9MW</b>	

1. Participants include 43 municipals located in Nebraska and 18 municipals located in Colorado, Iowa, Kansas & Wyoming
2. Participants include: OPPD, MEAN, Grand Island, & Jacksonville, FL
3. NPPD Purchase Contract – Participants include: OPPD, MEAN, Lincoln Electric System and Grand Island

# Why Do Other States Have More?

## ■ Combination of Reasons

- Federal Production Tax Credits
- State Production Tax Credits
- State Renewable Portfolio Standards
- Public Utility Commission requirements
- Transmission lines exist in good wind areas
- Need for additional generation
- Cost of wind vs. alternative energy resources





# Incentives for Public Power Utilities

- Renewable Energy Production Incentive (REPI) - an incentive “equivalent” to the Production Tax Credit
- Congressional appropriations and renewable generation growth has resulted in significant reductions in REPI payments
- Clean Renewable Energy Bonds (CREBs) - an alternative to REPI but are not close to the incentive level of Production Tax Credits/Grants



# Nebraska's laws are adapting

- As a result of incentive inequities, NPPD believes the lowest cost option for renewable energy is to partner with private entities that qualify for Federal Incentives
- May 2007, Nebraska Legislature passed LB 629 which granted Community Based Energy Development (C-BED) projects state sales tax exemption and gave public power the ability to waive our right of eminent domain during the contract period

# Nebraska's laws are adapting (cont'd)

- LB 561 allows public power districts to waive their eminent domain for private renewable projects
  - Private entity must enter into a power purchase agreement with the public power utility
  - Facilitates Power Review Board approval
  - Changed the financial calculation for C-BED projects
  - Requires wind developer to post decommissioning security
  - Prohibits wind agreement terms with landowners from exceeding 40 years; terminate after 10 years inactive
  - Becomes law on Aug. 30

# Nebraska's laws are adapting (cont'd)

- LR 83 – The wind study resolution created a task force to study the following topics:
  - Land use issues and environmental impacts, including transmission
  - Financial benefits and risks of wind development for consumption and export
  - Content and status of renewable energy bills introduced this year
- Nebraska Power Association and NPPD are actively involved
  - White papers and technical committee members

# Federal laws are likely to change, too.

- Shift to the political left with Congressional leadership and administration
- Environmental Protection Agency endangerment finding
  - CO<sub>2</sub> is a pollutant and harmful to public health
- Major legislation to reduce CO<sub>2</sub>
  - Cap and Trade
  - Carbon Tax
- Renewable Energy Standard Proposals



# Cap and Trade Proposals

	President Obama Campaign Proposal	H.R. 2454 Waxman Markey American Clean Energy and Security Act of 2009 (ACES)
Scope	Economy wide	Economy wide
Begins	2012	2012
Targets	2020 – 1990 levels 2050 80% below 1990	3% below 2005 by 2012 17% below 2005 by 2020 42% below 2005 by 2030 83% below 2005 by 2050
Allowances	100 auction	Free allowances* declining to zero in 2030

\* Free allowances insufficient to cover all emissions

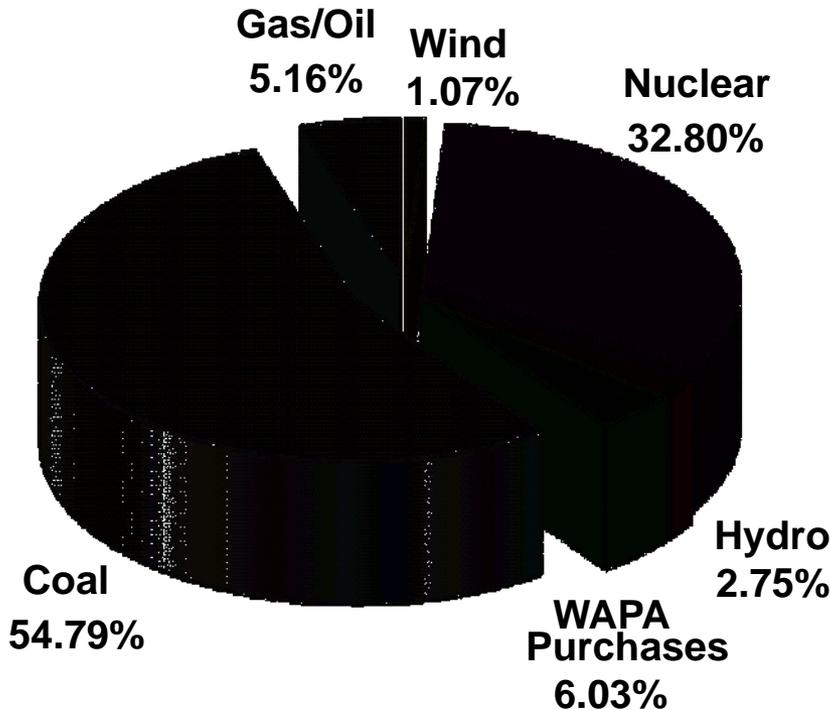
# NPPD 2008/2020 Fuel Mix Comparison with Significant Carbon Constraints w/o LES Share of GGS & Sheldon

Sources of CO<sub>2</sub> & Non CO<sub>2</sub> Emitting Resources

**2008**

## Generation Resources

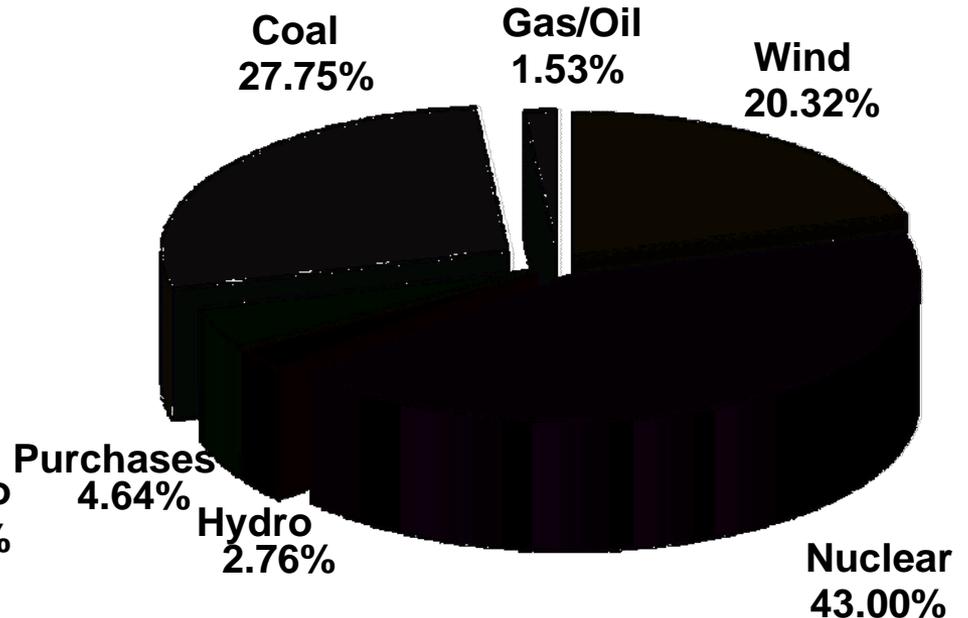
18,403,960 MWh @ Busbar



**2020**

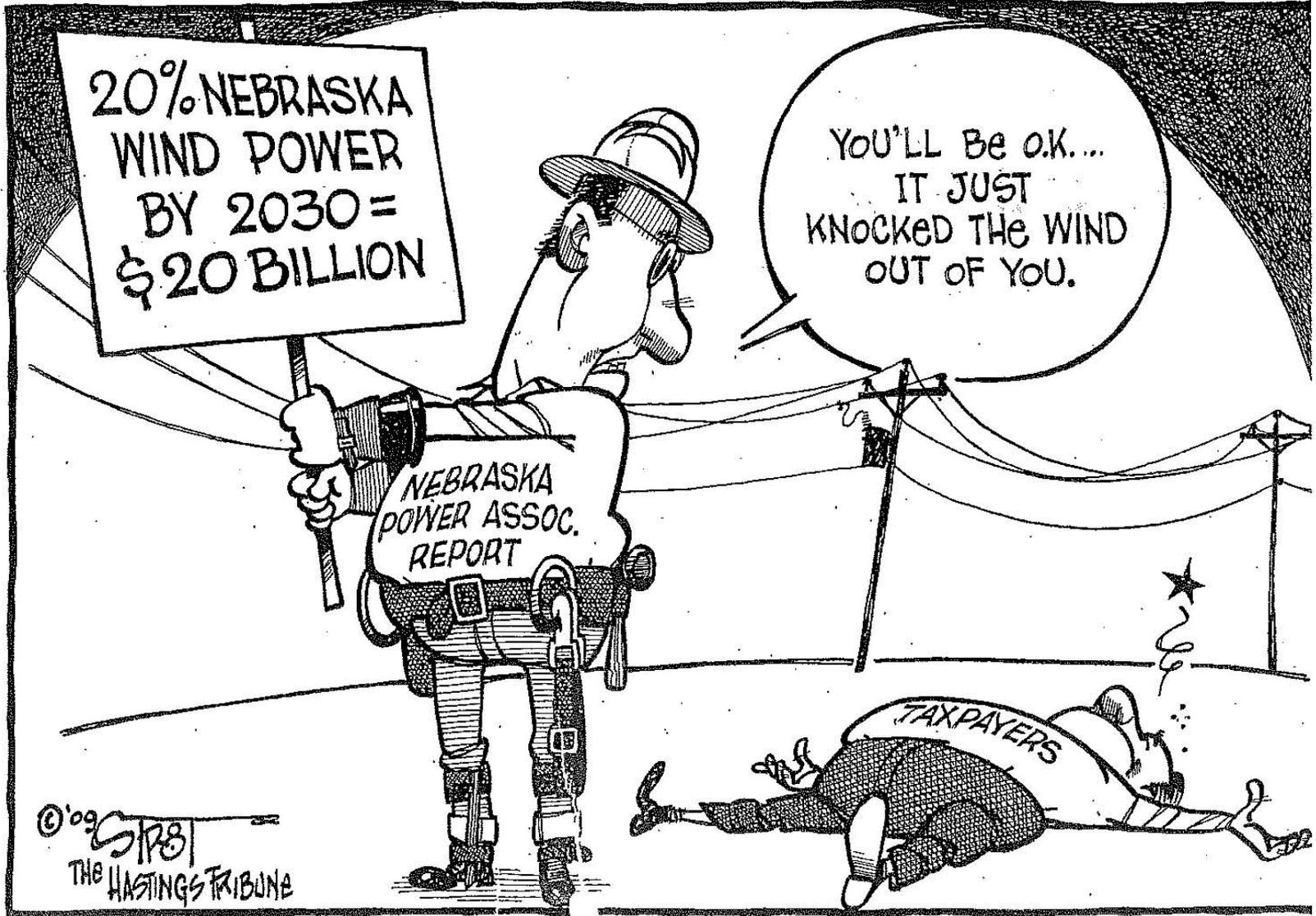
## Generation Resources

16,217,600 MWh @ Busbar



# Editorial

7-1-09 *Seward City Independent*

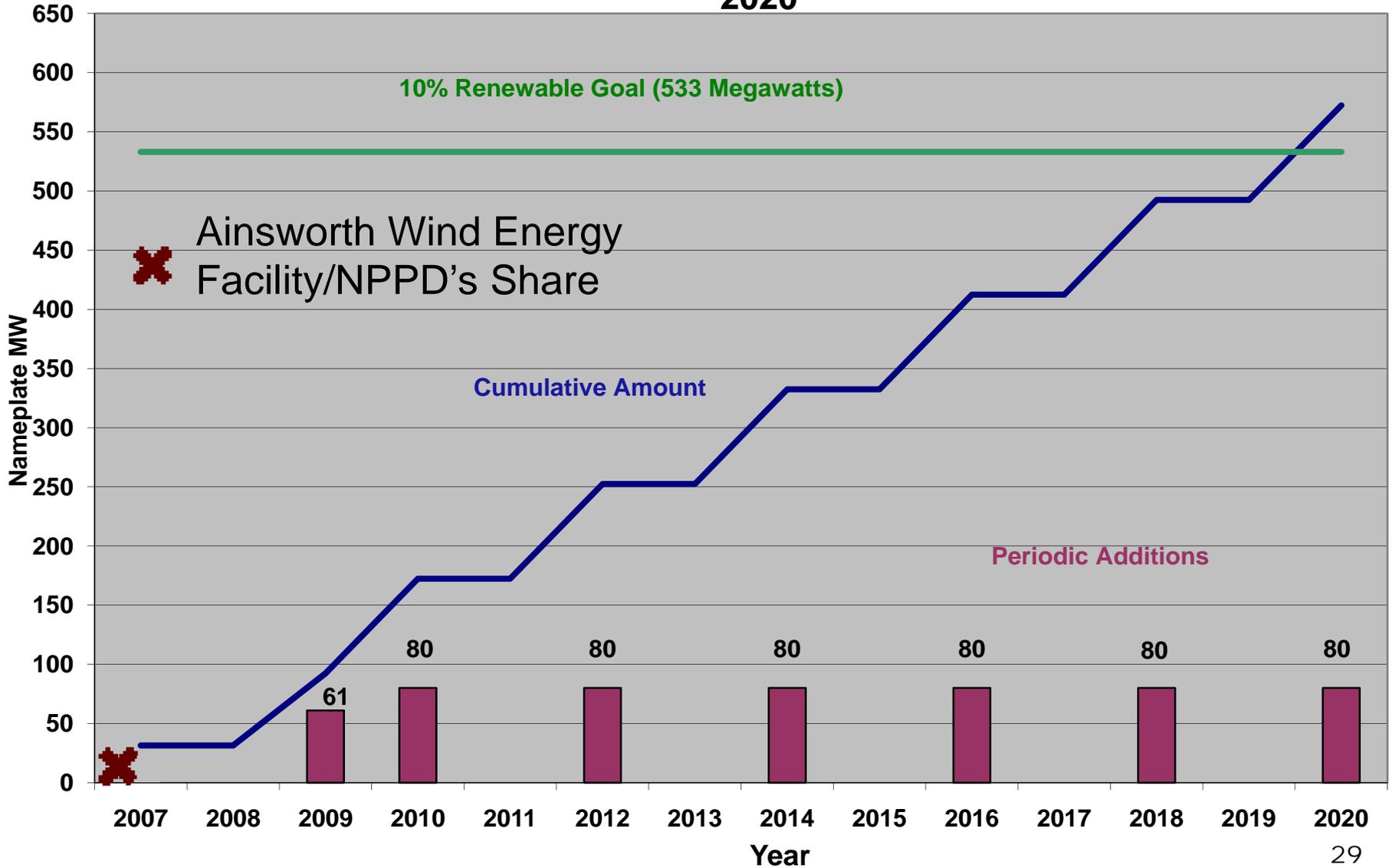


# So, meanwhile, what is NPPD doing?

- 10% renewable generation in mix by 2020
  - OPPD has the same goal (combined total equates to approximately 1,000 megawatts)
  - These are the current drivers for Nebraska's timetable.
  - A national renewable energy standard may require a change.

# NEBRASKA PUBLIC POWER DISTRICT

## Wind Generation Addition Plan to Meet 10% Renewable Goal by 2020





# So, meanwhile, what is NPPD doing?

- 10% renewable generation in mix by 2020
  - OPPD has the same goal (combined total equates to approximately 1,000 megawatts)
- Currently evaluating wind proposals to add another 80-160 megawatts of wind generation to Nebraska's 150
  - As we did with Elkhorn Ridge and Crofton Hills
    - 20-year agreements
    - Evaluated for low cost, environmental factors, access to transmission

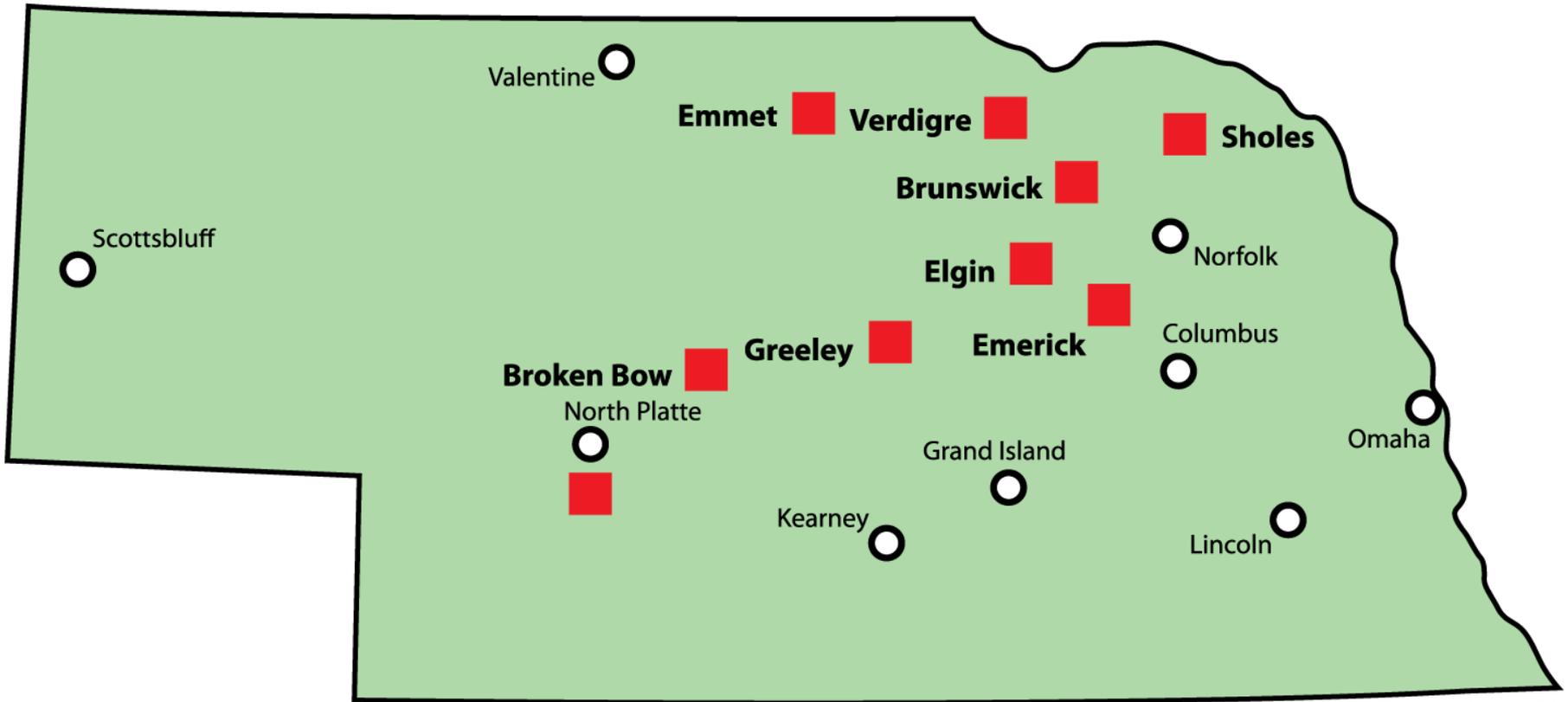


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  - As we did with Elkhorn Ridge and Crofton Hills
    - 20-year agreements
    - Evaluated for low cost, environmental factors, access to transmission
- Installing meteorological towers to study the wind
- Securing land rights gives NPPD more options

# Nebraska Public Power District's Wind Monitoring Sites

 **Wind Monitoring Sites**



G131735.ZIP

# NPPD Efforts to Secure Land Rights



- Engaged a consultant, Renewable Resource Associates
- Determine if there is sufficient landowner interest within a specific area

# NPPD Efforts to Secure Land Rights

(cont'd)



- Land option agreement
  - Initially 5 years and 5-year extension
- Future project could be:
  - NPPD development (i.e., Ainsworth)
  - A C-BED project
  - A non-C-BED, privately owned project
- Landowners have more options



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[Questions to Ask](#)

[Landowner Interest Form](#)

## Landowner Interest Form

As NPPD periodically considers adding more wind generation to its energy sources, there is the need to identify potential land sites for future wind development. Below is a short survey form that you may complete to identify your property for possible future consideration. Before you click to submit your answers, please make sure all boxes indicated with an asterisk (\*) are completed.

By submitting information, NPPD does not guarantee that the land would be considered for future wind farm development. NPPD will contact a landowner if it is interested in the land as part of a potential wind energy facility.

Upon completion of this form, you will receive a confirmation of your submittal.

# What else is NPPD doing?

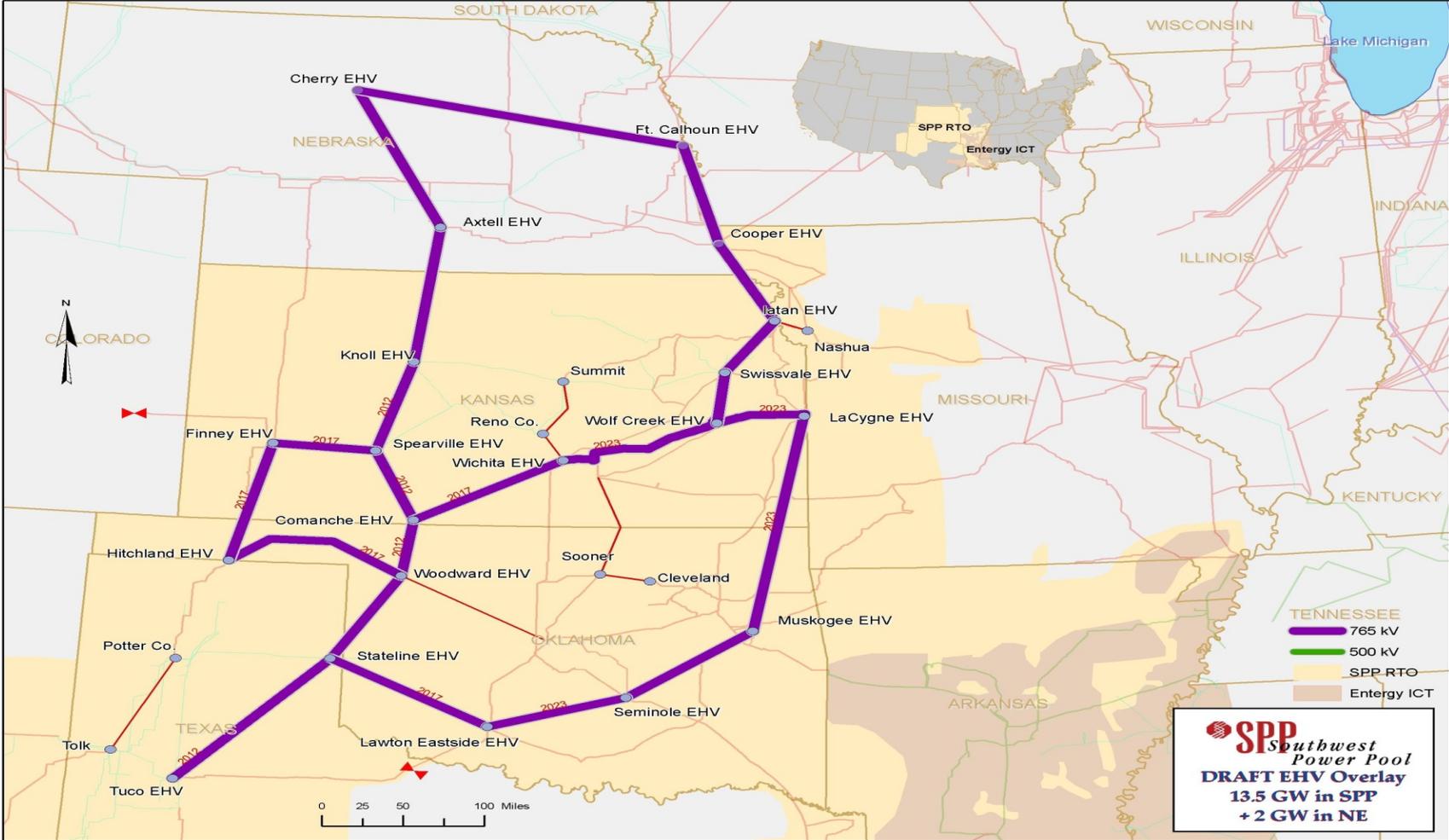
- Seeking potential small scale renewable energy projects:
  - Types of renewables
    - PURPA Qualified – Bio Mass, Solar, Wind, Co-Gen and Heat Recovery Generation
  - Size
    - > net metering (25 kilowatts or less)
    - <10 megawatts
  - Partnering with wholesale customers
    - Projects < 2 MW can be purchased directly by the wholesale partner

# Small scale renewable projects (cont'd)



- RFP issued early 2nd quarter 2009
  - Let our wholesale customers know in May about the RFP
  - Press release and RFP issued: May 19<sup>th</sup>
  - Proposals due September 1, 2009
  - Coordinate with USDA

# Nebraska Utilities Join Southwest Power Pool



**SPP** Southwest Power Pool  
**DRAFT EHV Overlay**  
 13.5 GW in SPP  
 + 2 GW in NE



# In the end ...

- New legislation will increase the pace of wind development in Nebraska
  - Larger farms bring economies of scale, lowers costs
  - Studying wind for export allows development beyond the needs of Nebraskans
  - Who will buy the power, build the lines, construct the farms?
- Timetable for state and federal legislation unknown
  - Implementation takes time
  - High voltage transmission lines take time to site and construct
  - Environmental factors will play a big role
- Public power plans to be involved

# Questions?

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**Nebraska Public Power District**

*"Always there when you need us"*

