

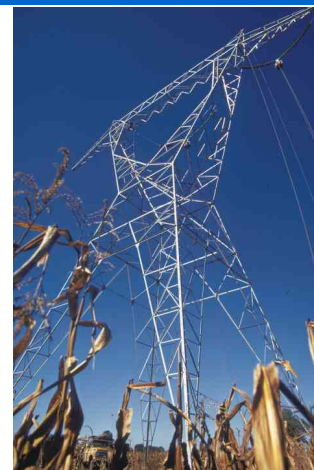
Next Steps for Arkansas in Exploring Wind Energy Development

Arkansas Wind Energy Conference
University of Arkansas – Fort Smith
January 17th, 2008



AEP **SOUTHWESTERN
ELECTRIC POWER
COMPANY**SM

A unit of American Electric Power



Introduction

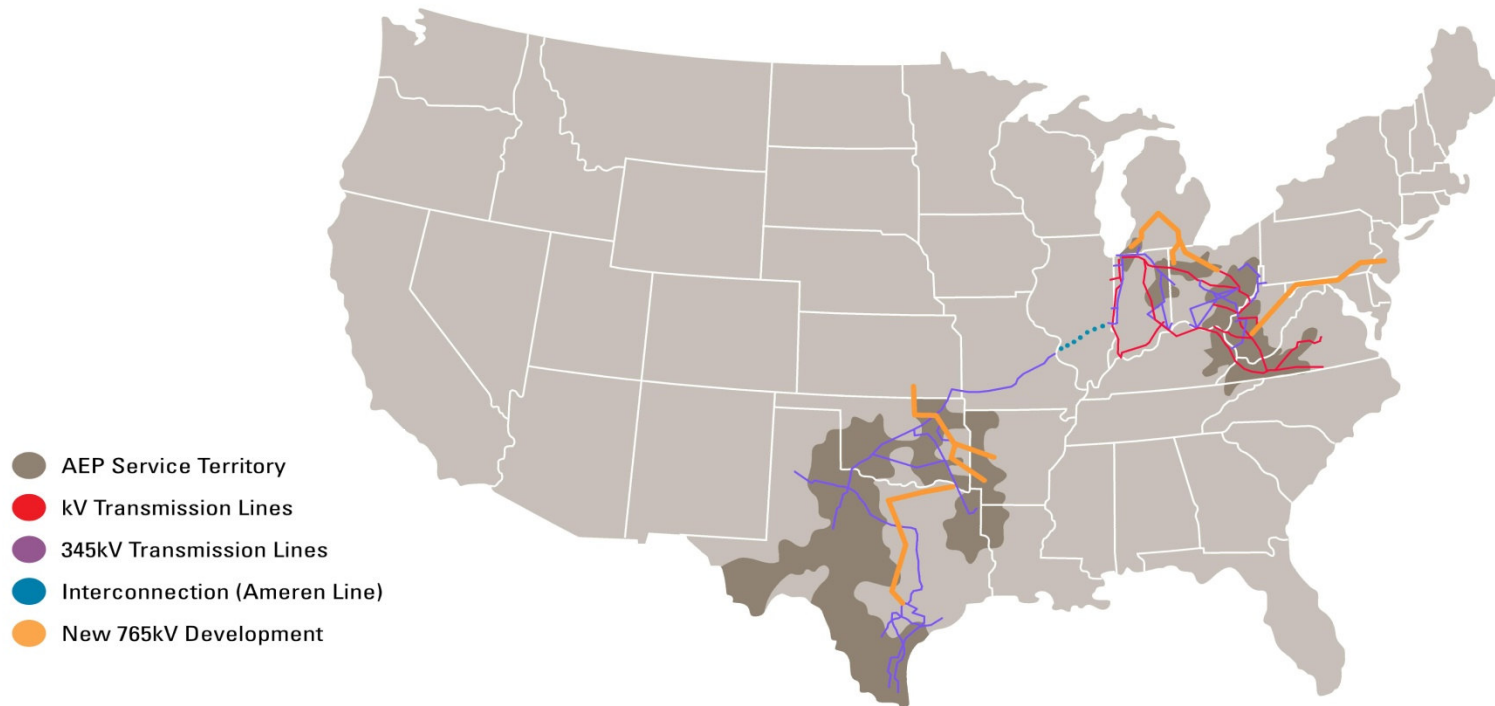
- AEP / SWEPCO overview
- AEP wind experience
- Developing a wind project
- Suggestions for Arkansas
- Conclusion

The AEP Footprint

Strength & Scale in Assets & Operations

- **5.1 million customers in 11 states**
- **Industry-leading size and scale of assets:**

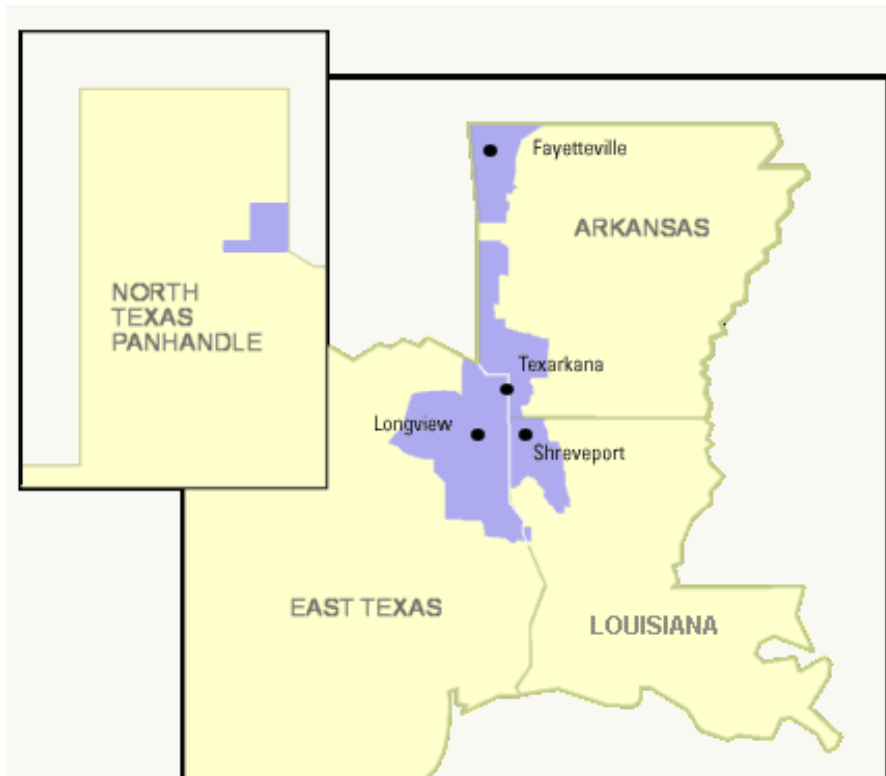
Asset	Size	Industry Rank
Domestic Generation	~38,400 MW	#2
Transmission	~39,000 miles	#1
Distribution	~208,000 miles	#1



SWEPSCO

Southwestern Electric Power Company

- One of seven regional utility subsidiaries of American Electric Power
- SWEPSCO service territory encompasses portions of Arkansas, Louisiana and Texas
- 464,000 customers, including:
 - 112,000 in western Arkansas
 - 176,000 in Northwest Louisiana
 - 176,000 in East Texas and the North Texas Panhandle



Wind Projects and PPAs

- 5 MW Ft. Davis Wind Farm: Early AEP R&D Project (1996 - 2004) Decommissioned
- 75 MW Southwest Mesa PPA: Project built on AEP owned land (1998) SWEPCO
- 150 MW Trent Wind Farm: AEP owned / developed IPP wind farm (2001) AEPEP
- 160 MW Desert Sky Wind Farm: AEP owned IPP wind farm (2001) AEPEP
- 147 MW Weatherford PPA: (2005) PSO
- 151 MW Blue Canyon II PPA: (2005) PSO
- 94.5 MW Sleeping Bear PPA: Completion in Summer 2007 PSO
- 100 MW Fowler Ridge PPA: Completion in late Q4 – 2008 I&M
- 100 MW Fowler Ridge PPA: Completion in late Q4 – 2008 APCo
- 75 MW Camp Grove PPA: (2007) APCo
- Plan for additional 725 MW by 2011

**AEP has a total of 742 MW of wind under contract
and owns an additional 310 MW of wind**



Next Steps for Arkansas in Exploring Wind Energy Development



Wind Development Considerations

- **Wind Resource**

- NIMBY / Community Acceptance

- **Transmission / Interconnection**

- Engineering

- **Permitting**

- Real Estate

- Self-build or Purchased Power

- **Regulatory Recovery**

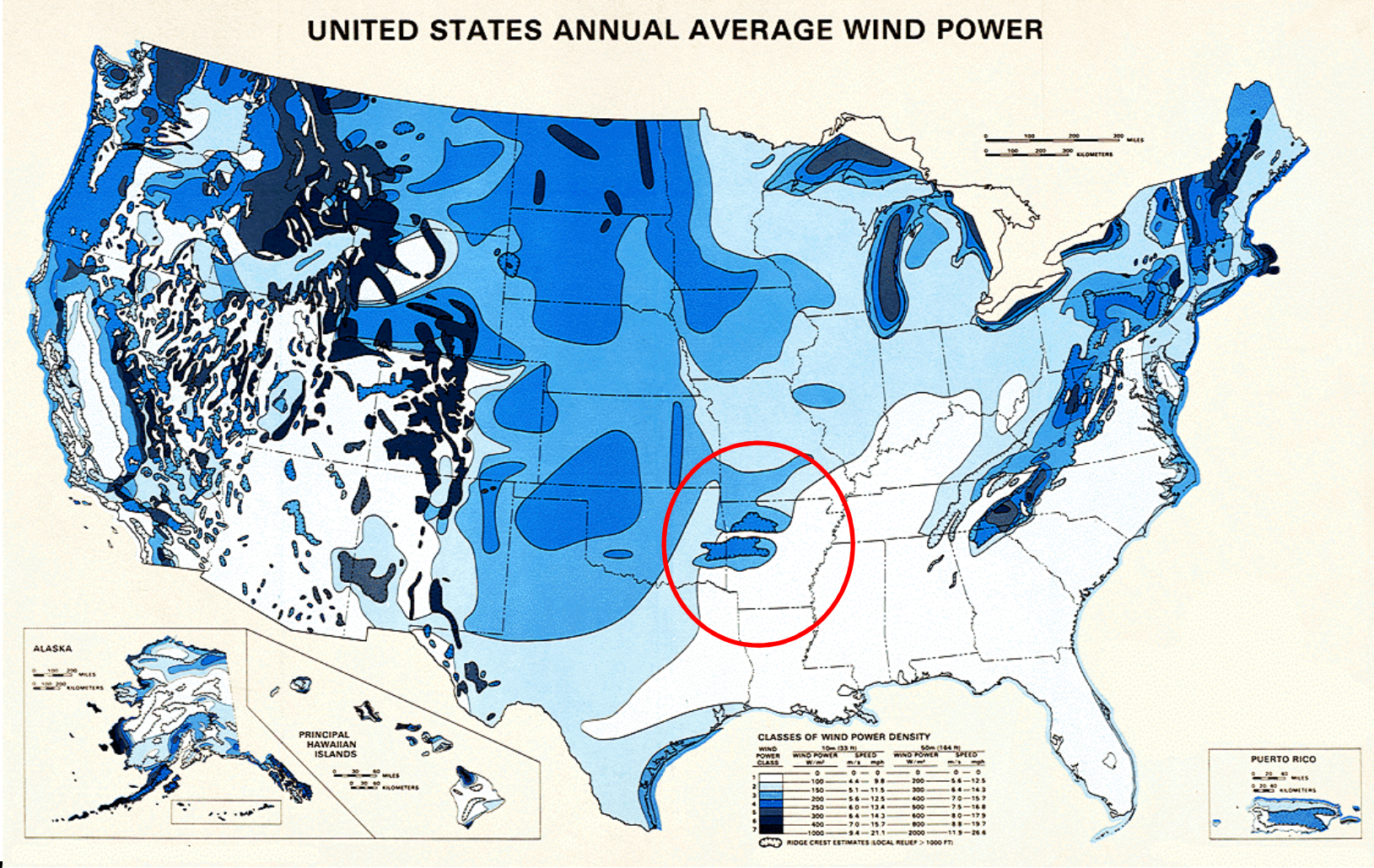
- Turbine Selection

- **State or Federal Incentives**

- Operations Plan

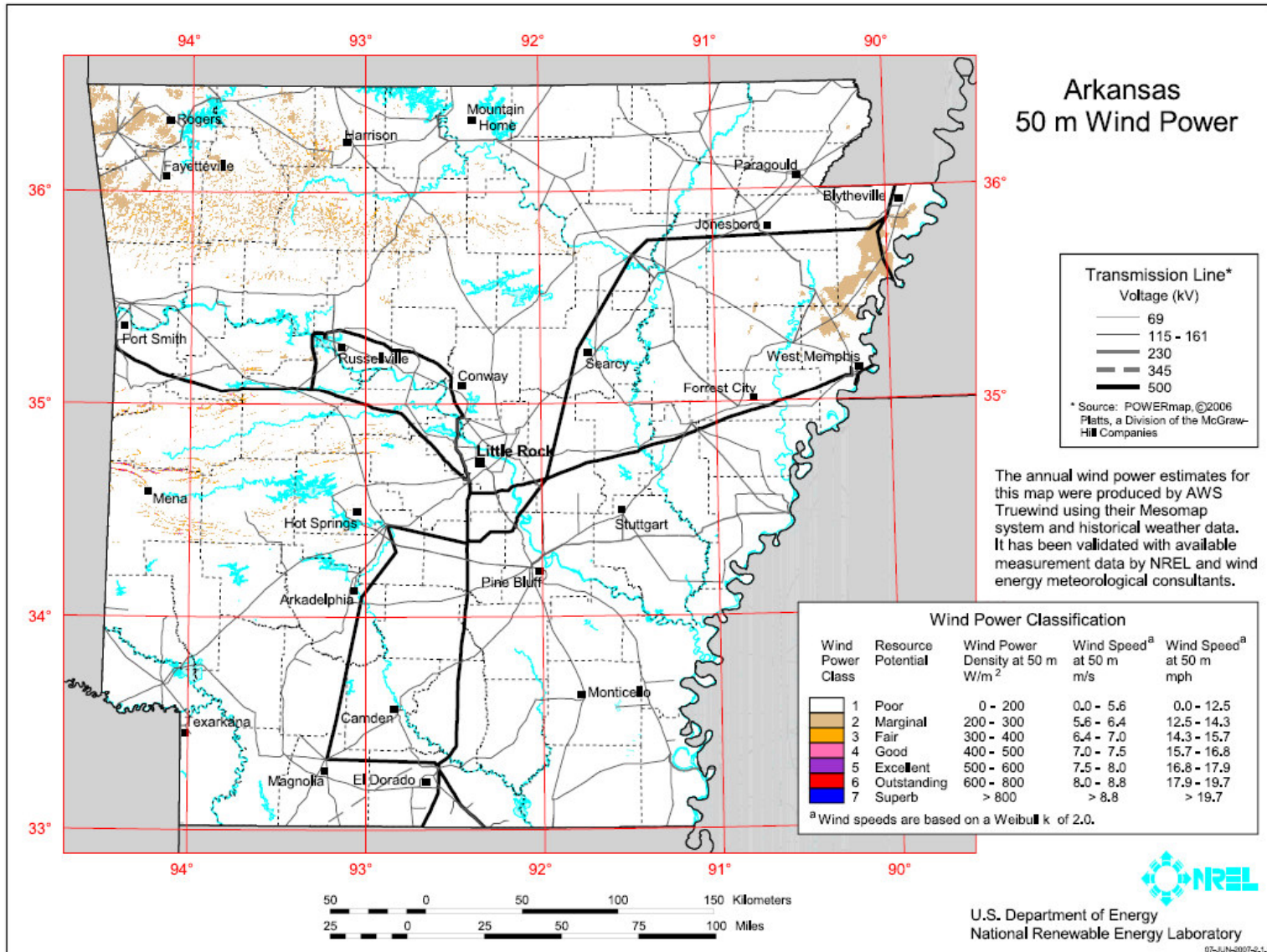
- **Cost of Energy / Financial Projections**

US Wind Map – Macro View



2007 DOE/NREL AR Wind Map

@ 50 meters height



Additional Wind Mapping for Arkansas

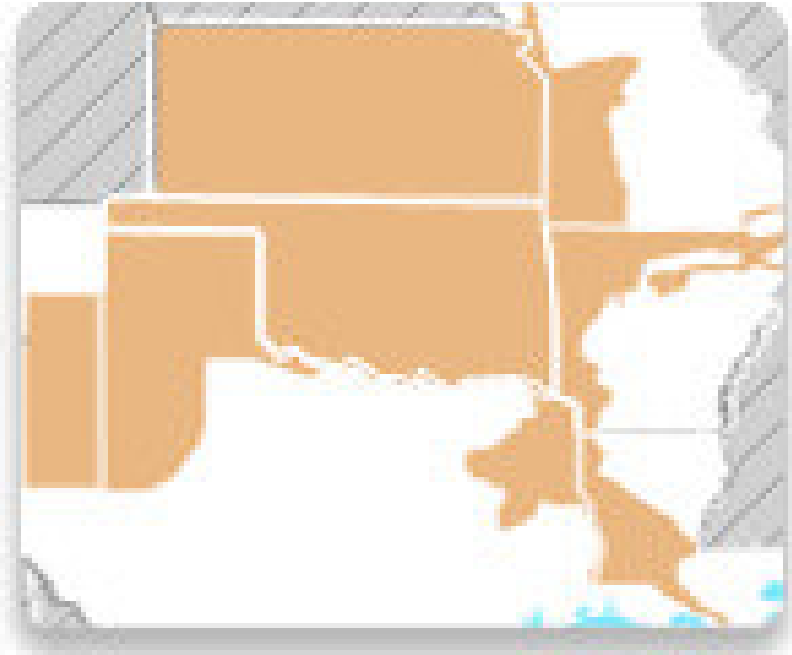
- Wind resource is key input for cost of energy
- Recent 2007 NREL Arkansas Wind Map @ 50 meters shows only marginal wind resources
- Most wind turbines now at 80 m hub height
- Wind resources generally increase at higher hub heights and elevations
 - Costs more to erect turbines at higher hub heights

Suggest development of additional wind maps:

- @ 80 and 100 meters
- Indiana "Tall Towers Study" is potential model for Arkansas

Transmission

- SWEPCO is located within the Southwest Power Pool (SPP)
- SPP is a Regional Transmission Organization which has members in 8 southwestern states (see www.SPP.org)



Source: www.SPP.org

- SPP is jurisdictionally mandated by FERC
- SPP manages transmission infrastructure, markets, and oversees compliance enforcement and reliability standards development.

Transmission (Continued)

- “Plugging-in” or connecting a wind farm into the SPP grid involves applying for **Generation Interconnection Service**
 - 3 Studies required: Feasibility, System Impact and Facilities Engineering
 - If study results are acceptable, leads to an Interconnection Agreement
 - Timing typically takes 12 to 18 months
- Getting the wind energy to market involves the transmission customer (usually a utility) applying to SPP for **Network Service** to move energy from the point of interconnection to its delivery customers
 - SPP queues the Network Service request and studies them in aggregate
 - Process will result in an allocation of system upgrade costs to requesting party
 - This process frequently takes as much as 18 months, or longer, due to size of interconnect queue or need to restudy entire queue each time an applicant drops out

- **Transmission Interconnection and provision of Network is an uncertain and lengthy process**
- **It materially affects project schedule and economics**

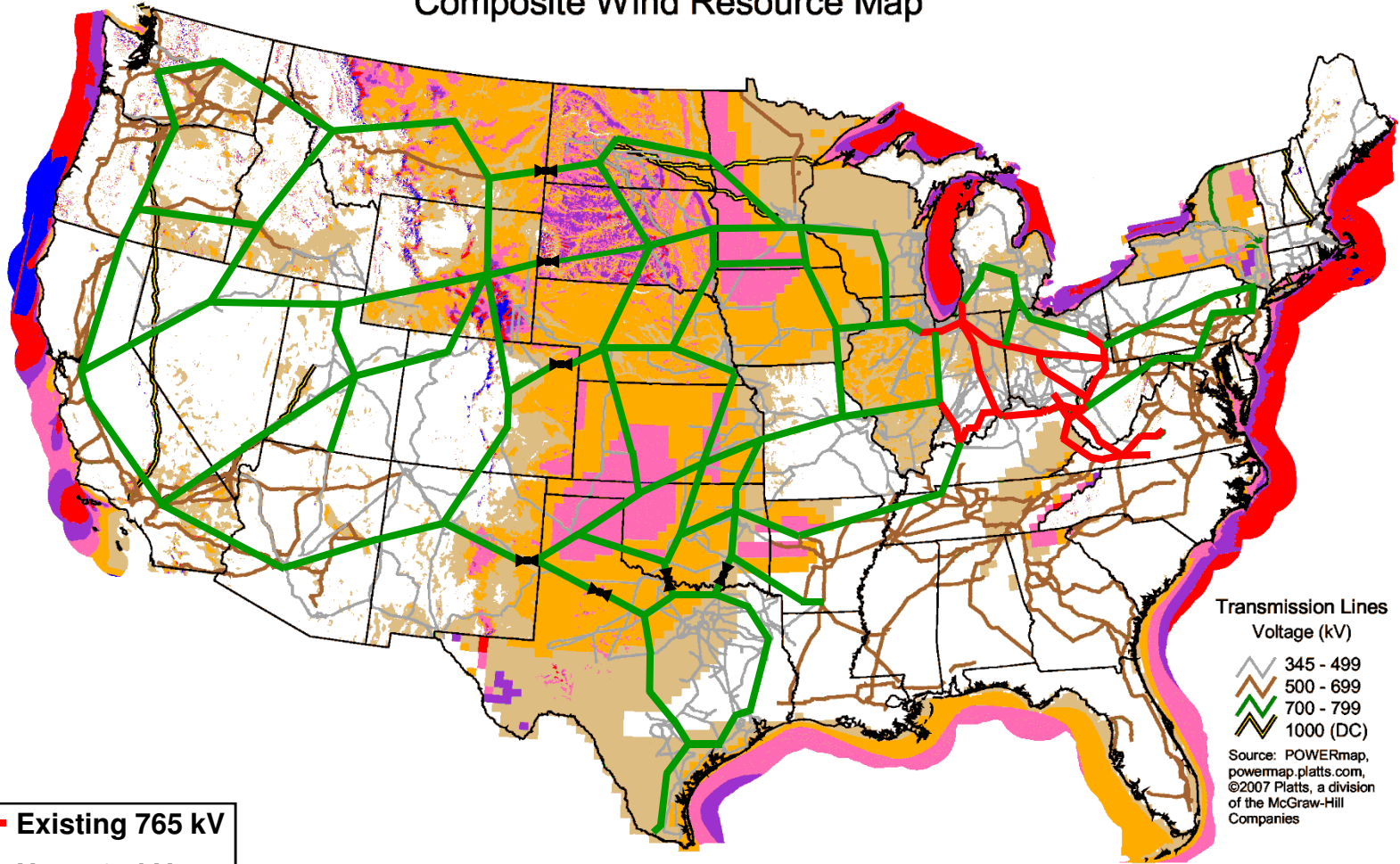


SPP Transmission Improvements

- Nation's transmission system is at a critical crossroads
 - Bottlenecks
 - Older, less efficient infrastructure
- Transmission is a key to renewable energy – delivering power from wind resource areas to electric load centers (major population areas)
- Improved transmission infrastructure needed in SPP and elsewhere across the country
- Must be developed as an interstate system, like nation's highways, to connect regions, states, communities
- AEP active in high-voltage transmission line development

Timely recovery of investments in transmission system improvements is crucial to development of renewable resources

Composite Wind Resource Map



— Existing 765 kV
— New 765 kV
↔ AC-DC-AC Link

Transmission Lines
 Voltage (kV)
— 345 - 499
— 500 - 699
— 700 - 799
— 1000 (DC)
 Source: POWERmap, powermap.platts.com, ©2007 Platts, a division of the McGraw-Hill Companies

Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

^a Wind speeds are based on a Weibull k value of 2.0

Permitting and Regulatory Recovery

- Permitting
 - Need fair and balanced approach to project permitting process
 - Project approval to consider public interest as well as cost

- Regulatory Recovery
 - Timely approval of generation and transmission investments (development, engineering, construction, operating, maintenance)
 - Reasonable rate of return on investment
 - Consider incentives such as extra rate of return for investments in specified technologies (e.g., IGCC, wind, other renewables)
 - Accommodation if new technology does not fully perform as expected or costs are higher than expected

A clear and transparent approach to permitting and regulatory recovery of future renewable energy and transmission projects is needed to promote development and investment that serves the Arkansas market

Federal Tax Incentives for Wind

- Federal tax benefits can represent over 1/2 of wind project NPV to project owners
 - Serves to “buy down” the cost of energy for customers
- Federal §45 Production Tax Credits
 - \$20 / MWh tax credit for first 10 years of operation, based on production
 - Expires on 12/31/08
 - Tax credit worth over \$30 / MWh
 - ($\$20 / (1 - \text{marginal tax rate of } 35\%, \text{ or more})$)
- MACRS Depreciation
 - Wind project enjoy 5 –year accelerated tax depreciation

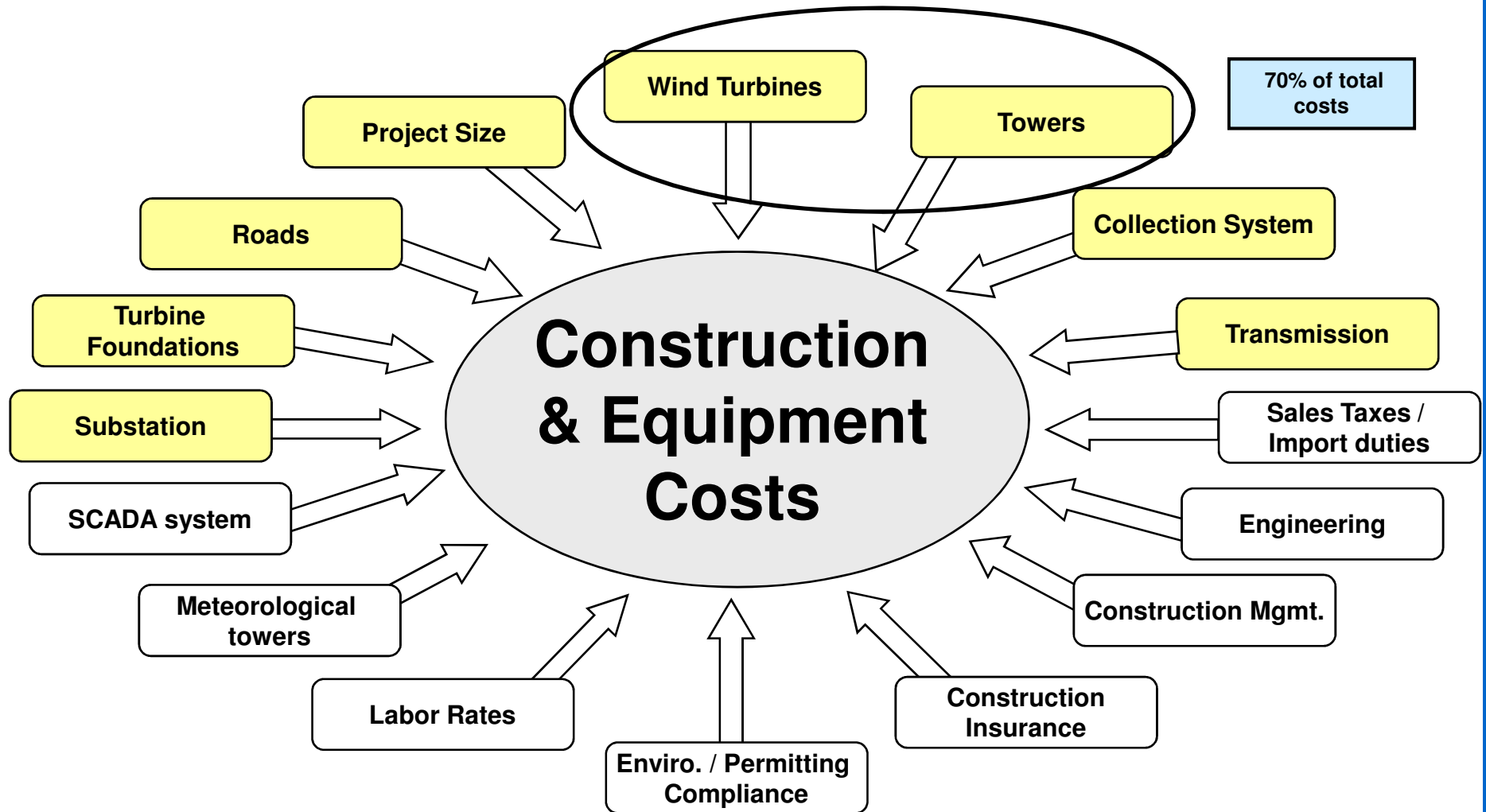
Congressional support for extension of the Federal Production Tax Credit is key to wind farm economics

State Tax and Regulatory Incentives

- Ratemaking incentives
 - Increase on combined rate-of-return (VA)
 - Increase on return for specific renewables investments (IN)
- Examples of state incentives for either developers or utilities:
 - Sales tax exemption for wind projects similar to other utility / manufacturing assets (many)
 - Property tax abatements / holidays (TX, other)
 - if we do it state wide, it may things easier than multiple local negotiations
 - Uniform property assessment procedures for property tax basis related to renewables
 - Accelerated depreciation for new wind or transmission (many)
 - Tax loss carry forwards (many)
 - Income tax forgiveness in incremental income related to renewables
 - State Production Tax Credit (OK)
 - See also: www.dsireusa.org

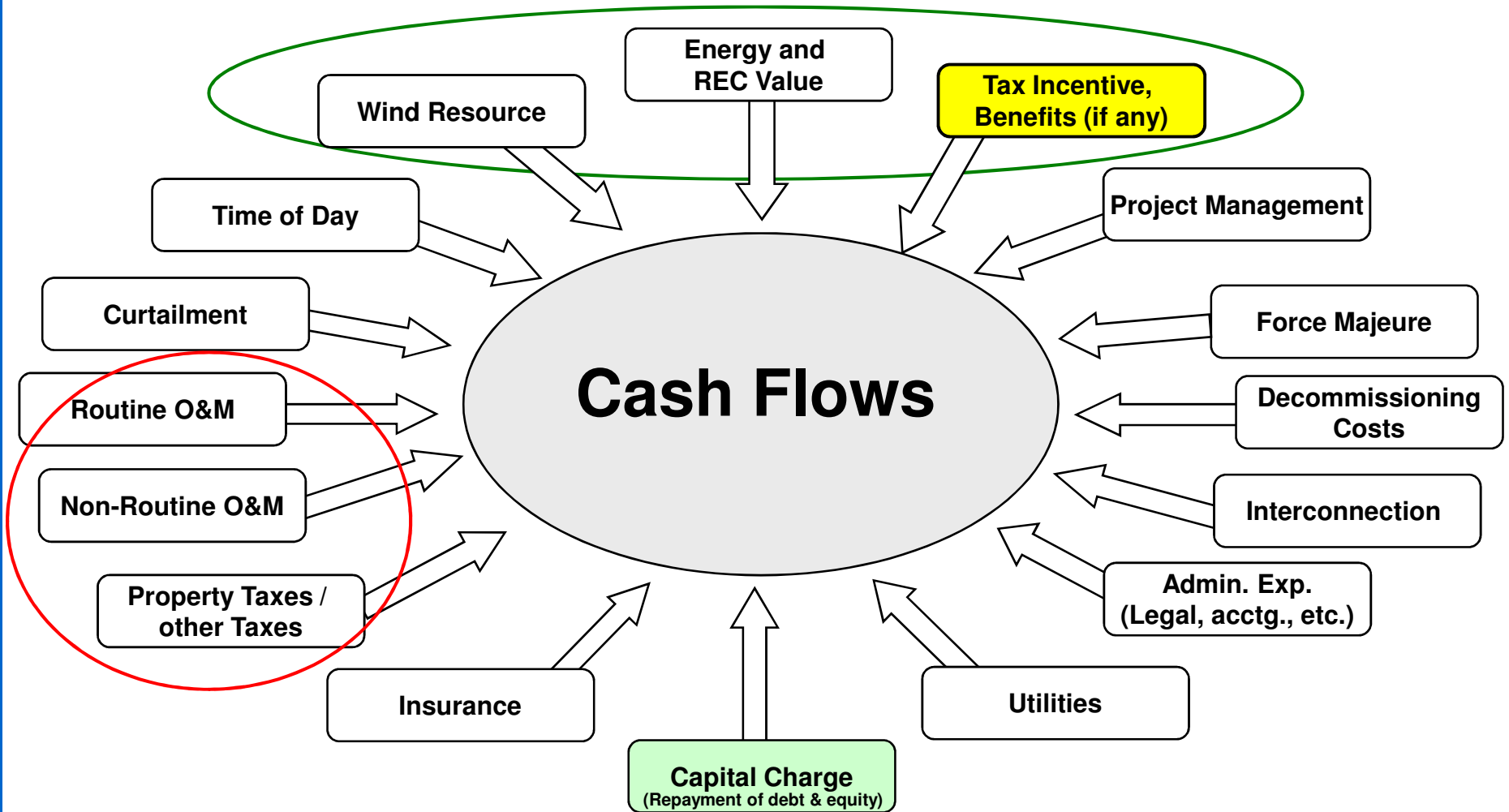
Arkansas Act 755 is an excellent start to encourage development of clean energy and renewable resources.

Upfront Capital Costs

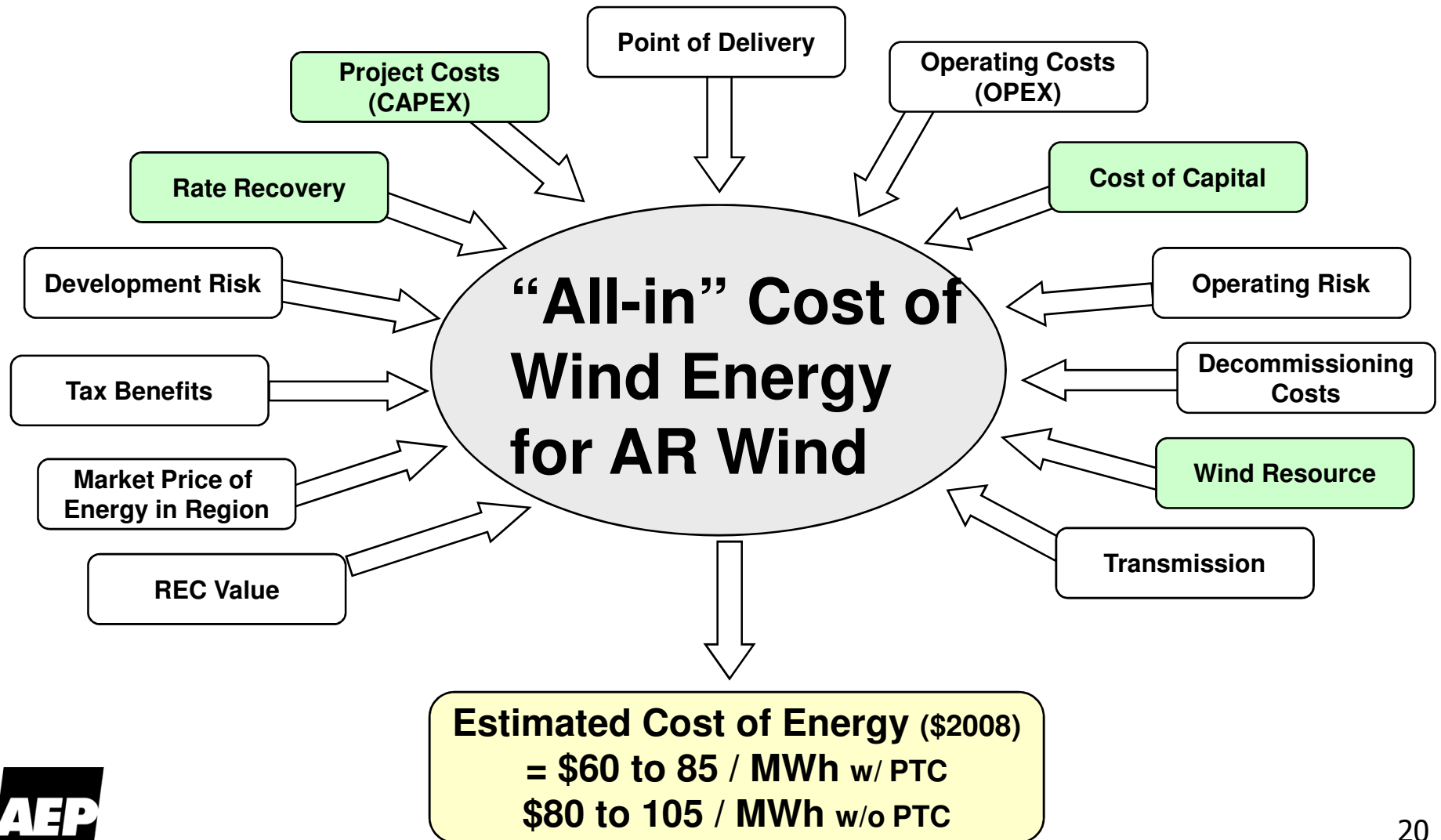


Installed cost of wind is now approximately \$2.0 Mil / MW

Revenues and Expenses



The Bottom Line



Conclusion

- Wind resources are site-specific and vary by region
- Wind mapping will help Arkansas more fully assess its potential for wind development
- Transmission is vitally important to wind development
- AEP proactively supporting a broad range of actions through its current investments in environmental retrofits, clean coal and renewable energy
- AEP's public policy strategy is to work as partners with regulators, legislators, community leaders and other stakeholders to ensure that we can continue to provide customers with safe, reliable, reasonably priced electricity in ways that protect the environment while ensuring AEP's financial stability



Questions

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