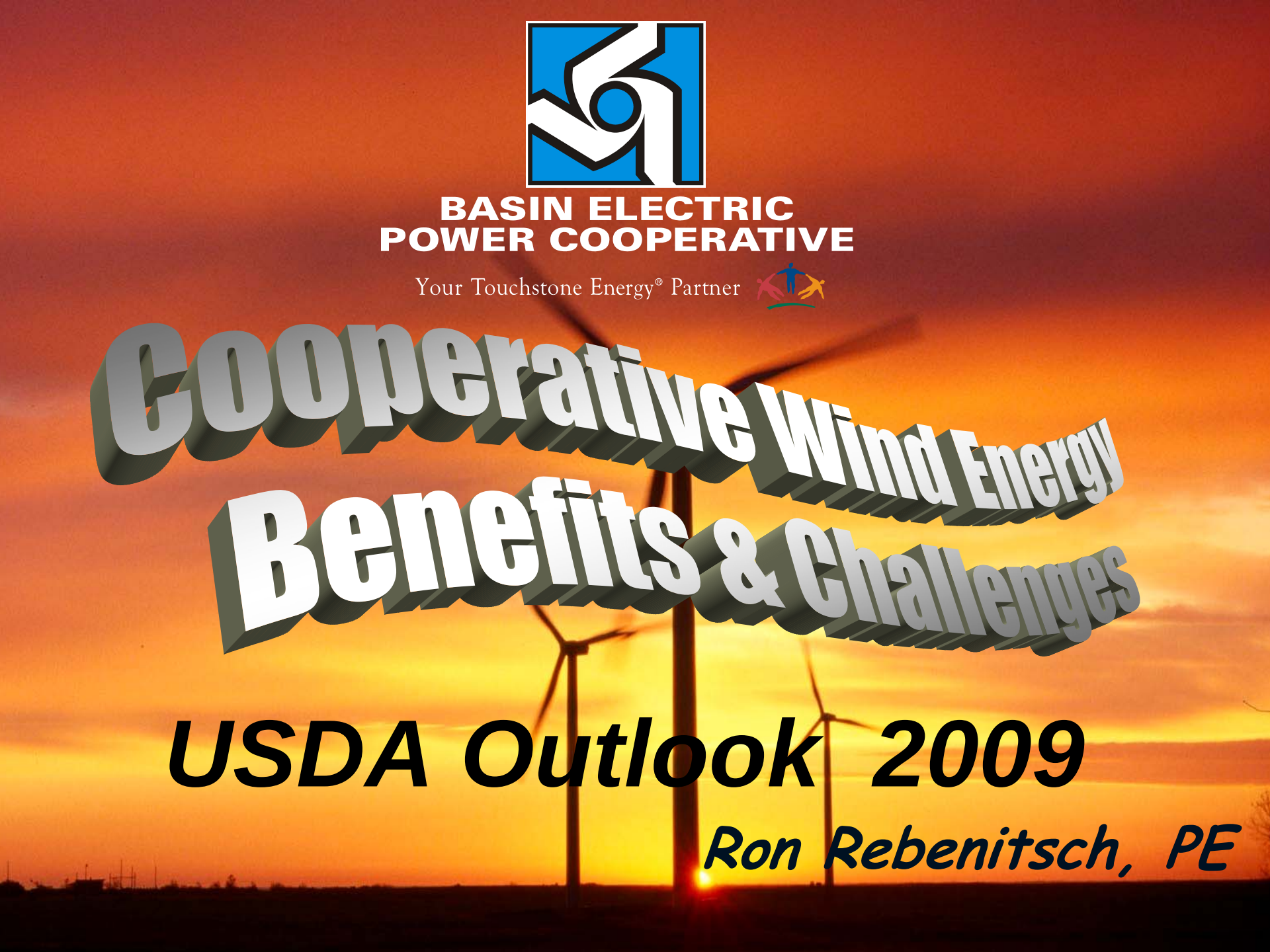
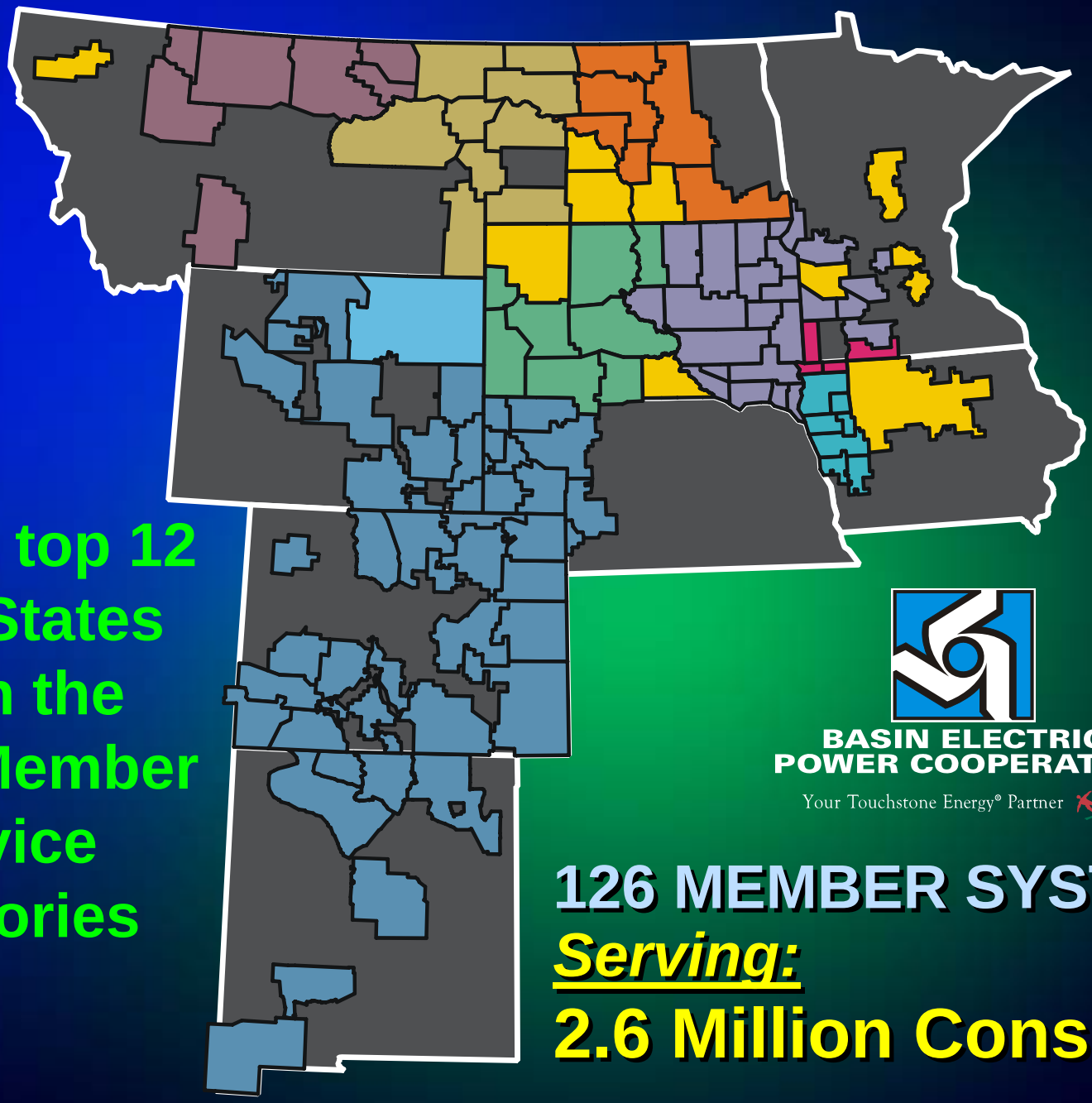

BASIN ELECTRIC
POWER COOPERATIVE
Your Touchstone Energy® Partner
Cooperative Wind Energy
Benefits & Challenges
USDA Outlook 2009
Ron Rebenitsch, PE



9 of the top 12 Wind States are in the Basin Member Service Territories

BASIN ELECTRIC POWER COOPERATIVE

Your Touchstone Energy® Partner

126 MEMBER SYSTEMS

Serving:

2.6 Million Consumers

Basin Electric's Green & Renewable Resources...

Existing:

136 MW Wind;

22 MW Waste Heat

500 MW Green & Renewable

New Wind:

120 MW in ND

150 MW in SD

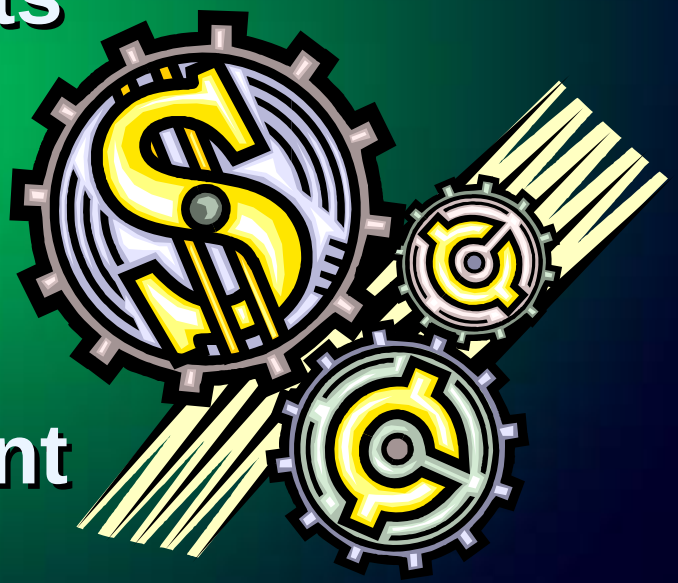
New Agreements:

49.5 MW Wind

22 MW Of Waste Heat

Enabling Factors for Wind

- **Excellent wind regime**
- **High cost of conventional resources**
- **Environmental Benefits**
- **Load growth**
- **Tax appetite**
- **Economic development**

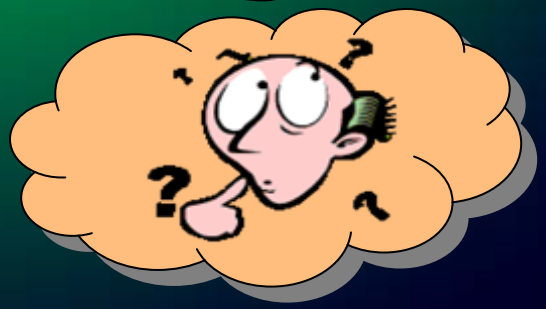


US Utility Planning?

"Regulatory risks are paralyzing the power industry while demand grows"

Power Magazine, January, 2008

Carbon Paralysis



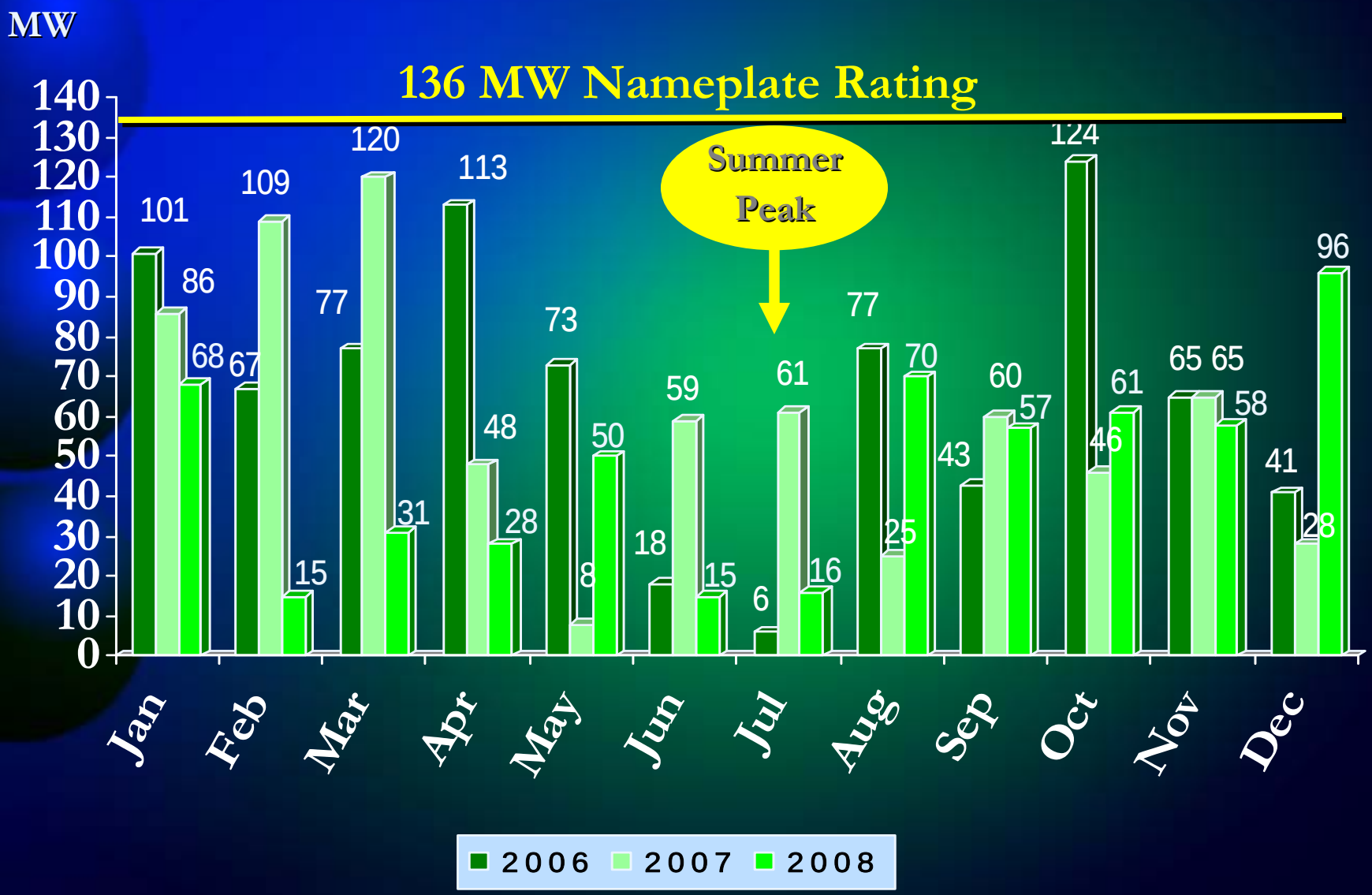
“Wind + Gas” is a viable option, with one concern

Gas Price Risk

Wind Offers a Hedge Against Gas Volatility

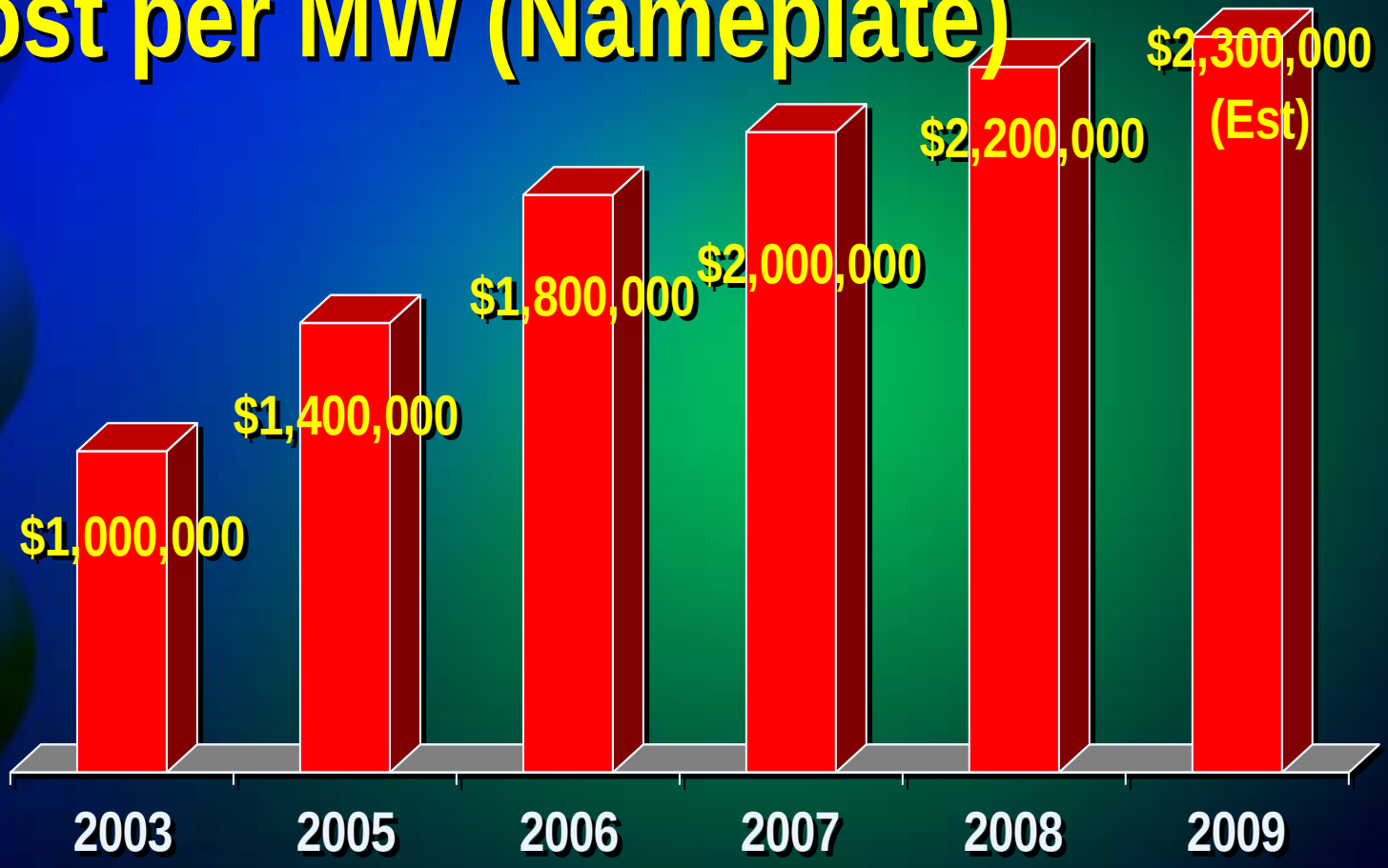
(Energy Only)

2006 - 2008 Wind Generation at Monthly Peak Hour of Demand



Wind Project Costs

Cost per MW (Nameplate)

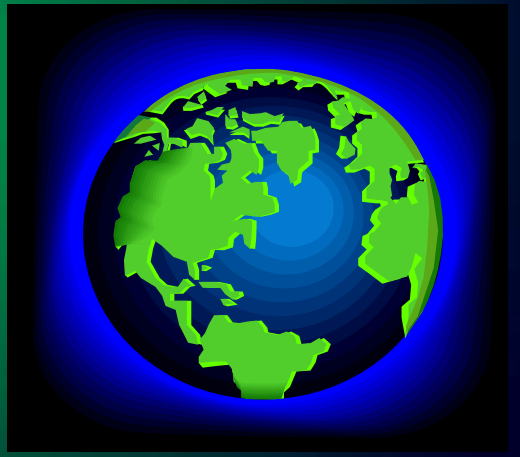


Macro-economic Issues…

Tax Credits?

Investor's Tax Appetite Hit by Recession

Supply chain constraints predicted to ease by 2011



Stronger US Dollar

50+ New Wind Manufacturing Facilities
2008 Built, Expanded, or Announced

Source: AWEA

Challenges & *Risks*

Environmental Permitting

Transmission

Major Federal Laws Applicable to Wind Projects

- Endangered Species Act
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Clean Water Act
- National Wildlife Refuge System Improvement Act
- National Environmental Policy Act

Many of these are triggered by Federal Nexus...

Examples:

"Major Federal Action" or "Nexus"

- **Federal Funding or Loans**
- **Interconnection to Federal transmission system**
- **Use of Federal Lands**
- **Etc.**

For a Smaller Project (< 50 Avg MW) Expect....

An Environmental Assessment

Permitting Costs & Schedule

$500,000 to $800,000

2-3 Years to Approval

Risk - Variable

For a Larger Project: (> 50 Avg MW) Expect...

An Environmental Impact Statement

Permitting Costs & Schedule

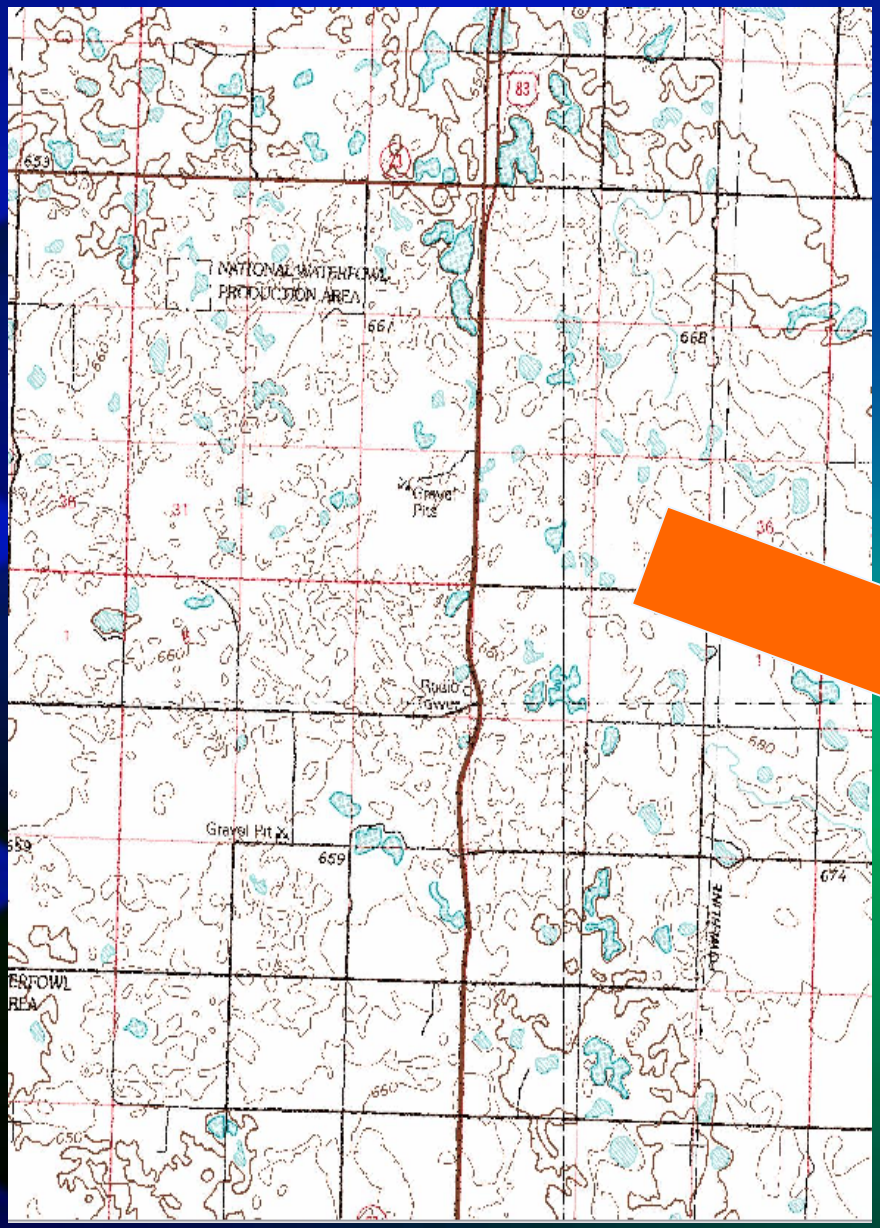
$1 Million Plus

2-4 Years to Approval

Risk - Variable

Plan for Studies on...

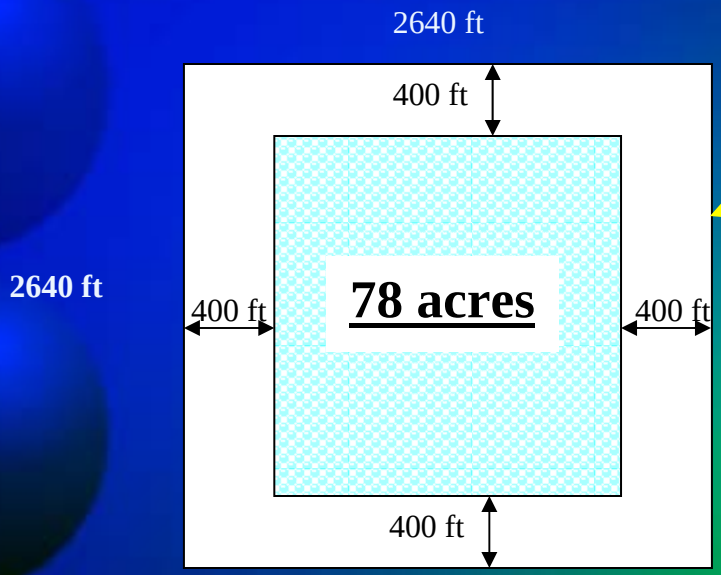
- Visual
- Avian/Bat
- Habitat (Incl. Fragmentation)
- Vegetation
- Biological
- Rare/Endangered Species
- Post Construction Monitoring



No Exclusions

With Exclusions

A New Regulatory Risk…
Setback from Property Lines



82 acres

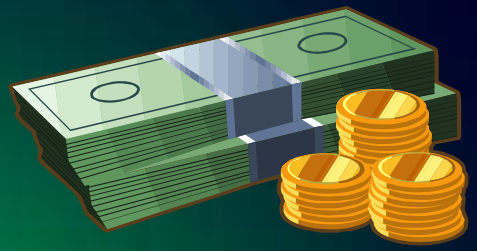
Example: A setback of "Fall Distance" can sterilize over 50% of the site.

Typical Quarter Section: 160 ac

Then add real constraints, such as shadow flicker & noise…
Leaves limited area for wind

Turbine Siting Economics

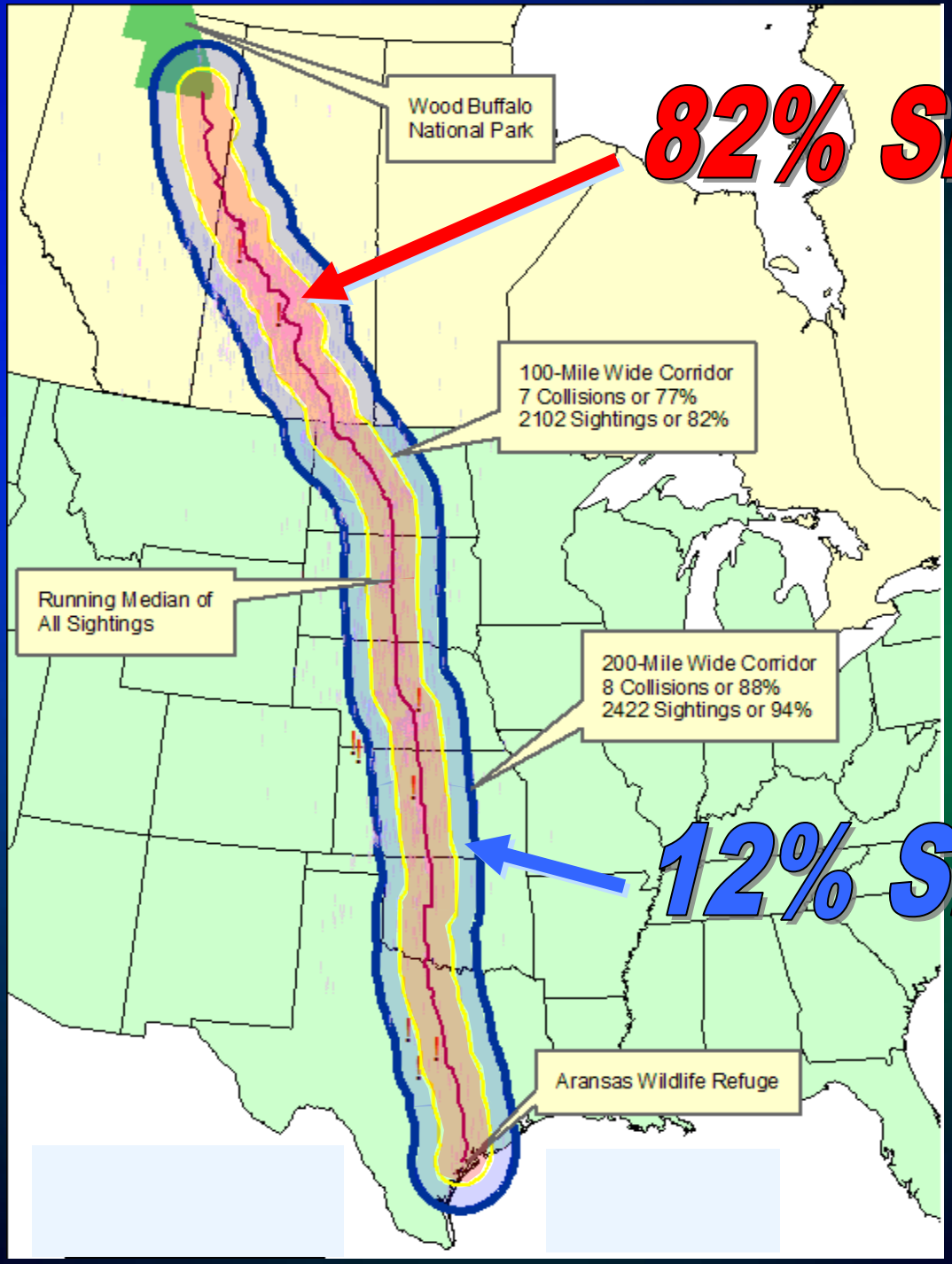
Siting is Critical



1 MPH Change in Avg. Annual Wind Speed Can Change Production by 15%

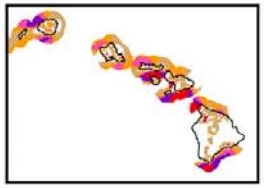
$50 Million Over Project Life?

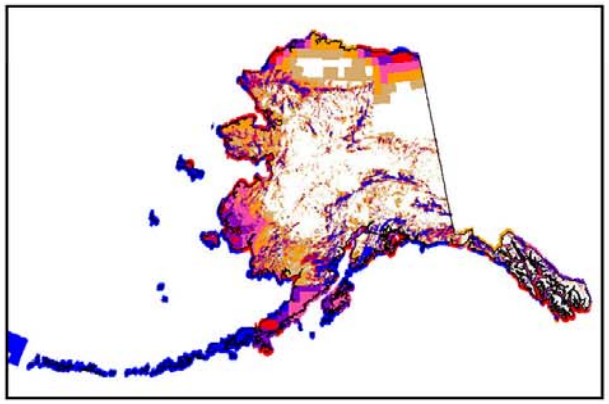
Endangered Species Issues


Wood Buffalo
National Park
82% Sitings
100-Mile Wide Corridor
7 Collisions or 77%
2102 Sightings or 82%
Running Median of
All Sightings
200-Mile Wide Corridor
8 Collisions or 88%
2422 Sightings or 94%
12% Sitings
Aransas Wildlife Refuge

United States - Wind Resource Map

This map shows the annual average wind power estimates at 50 meters above the surface of the United States. It is a combination of high resolution and low resolution datasets produced by NREL and other organizations. The data was screened to eliminate areas unlikely to be developed onshore due to land use or environmental issues. In many states, the wind resource on this map is visually enhanced to better show the distribution on ridge crests and other features.





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
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

U.S. Department of Energy
National Renewable Energy Laboratory

23-JAN-2008 1.1.3

Basin Electric has “Shovel-ready” Projects…

- **$250 Million of Wind This Year**
- **$350 Million of Wind Next Year**
- **Environmental Process: 2 Yrs to Date**
- **Turbines Bought**
- **Design Complete**

But…..!

We don't know when/if we can start?

Awaiting Environmental Approvals

USFWS Section 7 Consultation is in Process

When Planning Your Project:

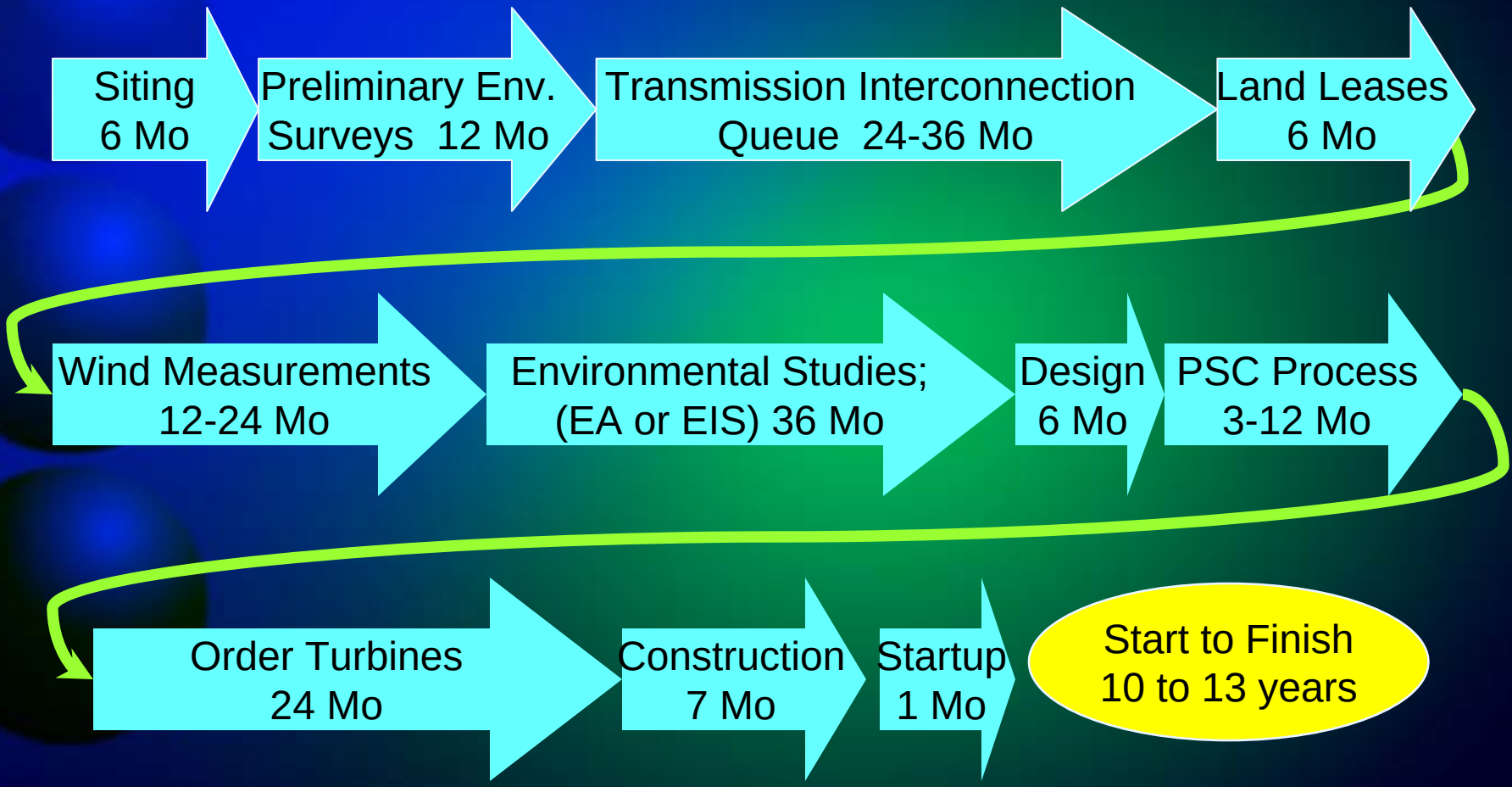
Expect Uncertainty!

Involve Multiple Federal Agencies Early

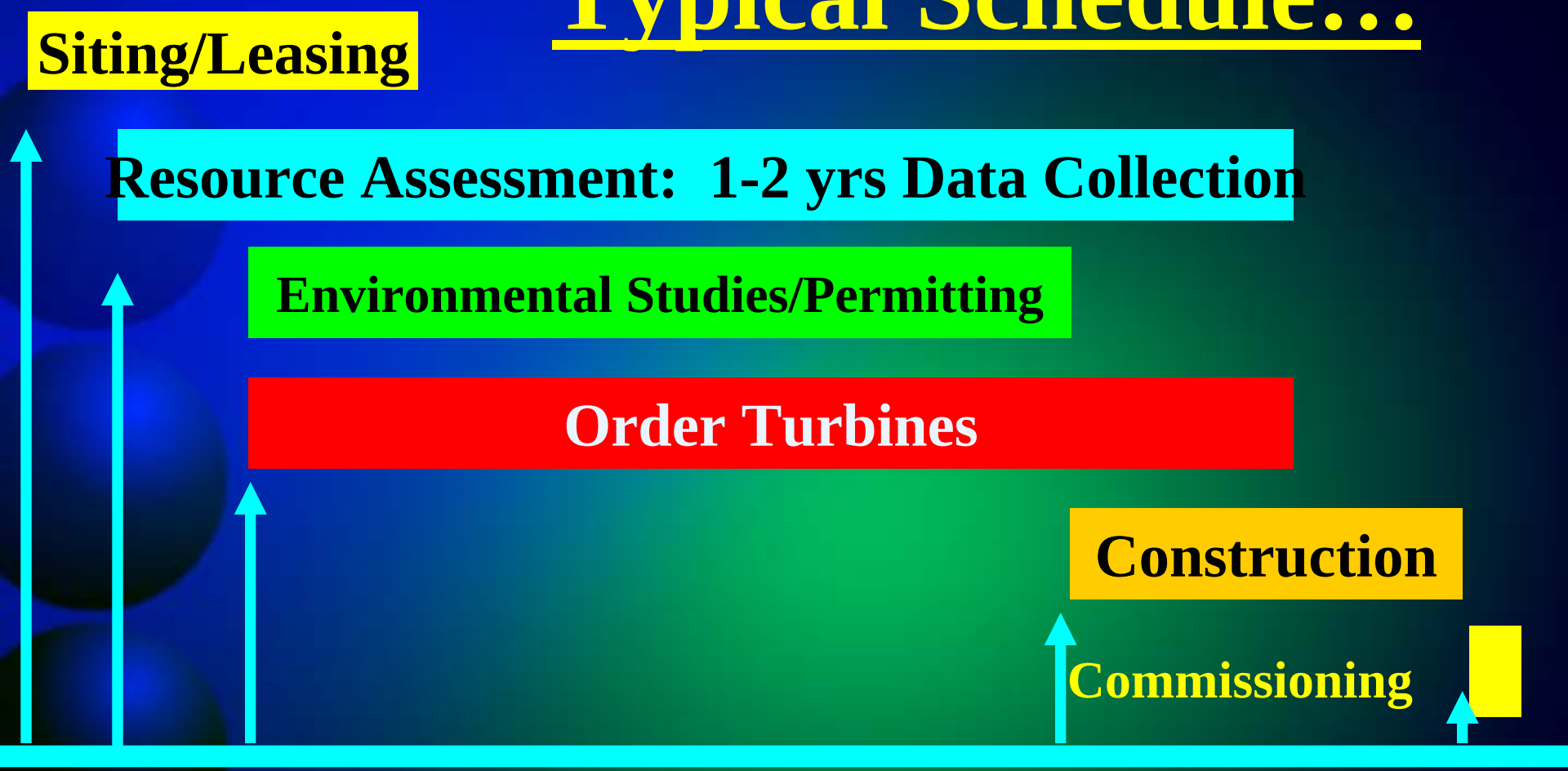
- 3 years of pre-approval biological studies?
- Section 7 Consultation - Endangered Species
- Section 106 Cultural Resource
  - General Consultation
  - Native American Consultation
- Mitigation Requirements Are An “Unknown”
- Limited Staff – Long Review Times
- Post Construction Monitoring

Make Sure Your Schedule Allows For Delays

"Perfect" Wind Project Schedule



Typical Schedule…



Start to Finish: Roughly 2 ½ years

New DOE/AWEA Wind Study

20% Wind by 2030

290,000 MW of Wind

Requires 16,000 MW/yr by 2018

16,000 MW/yr requires one 1.5 MW turbine every 49 minutes

DOE Study Forecasts...

- **500,000 New US Jobs**
- **Pmts to Landowners: $600 Million/yr**
- **Property Tax Revenue: $1.5 Billion/yr**

Study Indicates Higher Capital Cost of Wind is Offset by Fuel Savings

Study Identified Challenges

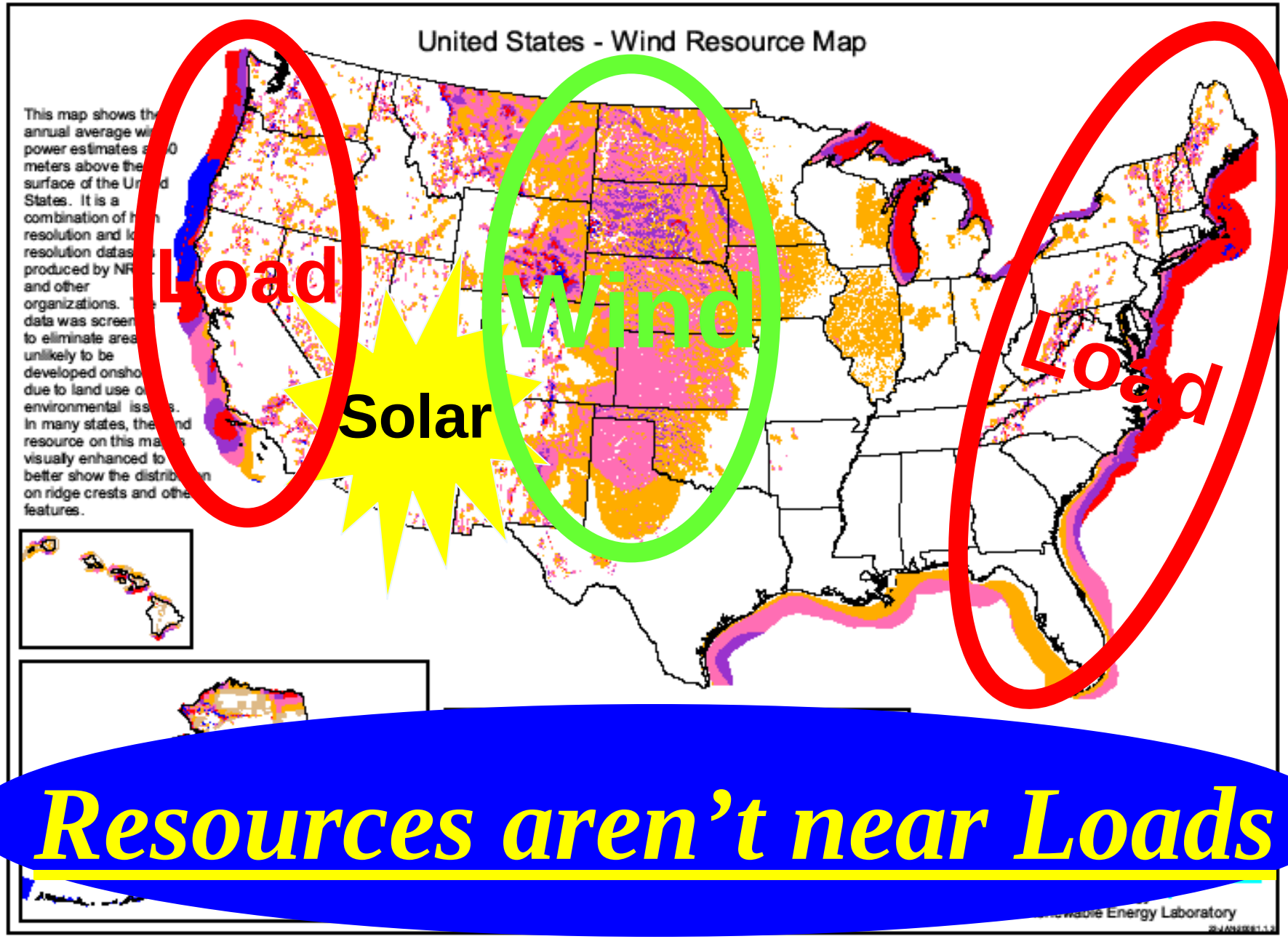
- **Transmission Infrastructure Need**
  - **AEP Study: $60 Billion**
  - **MISO Report:**
    - **22,000 MW for Existing RPSs**
    - **$80 billion for 15,000 miles (Eastern US Only)**
  - **Need Larger Transmission Control Areas**
- **US Manufacturing Capability**
- **Technology Advancements**
- **Environmental Constraints**

Nationwide…

42% of new US generating capacity in 2008

2nd Only to Natural Gas

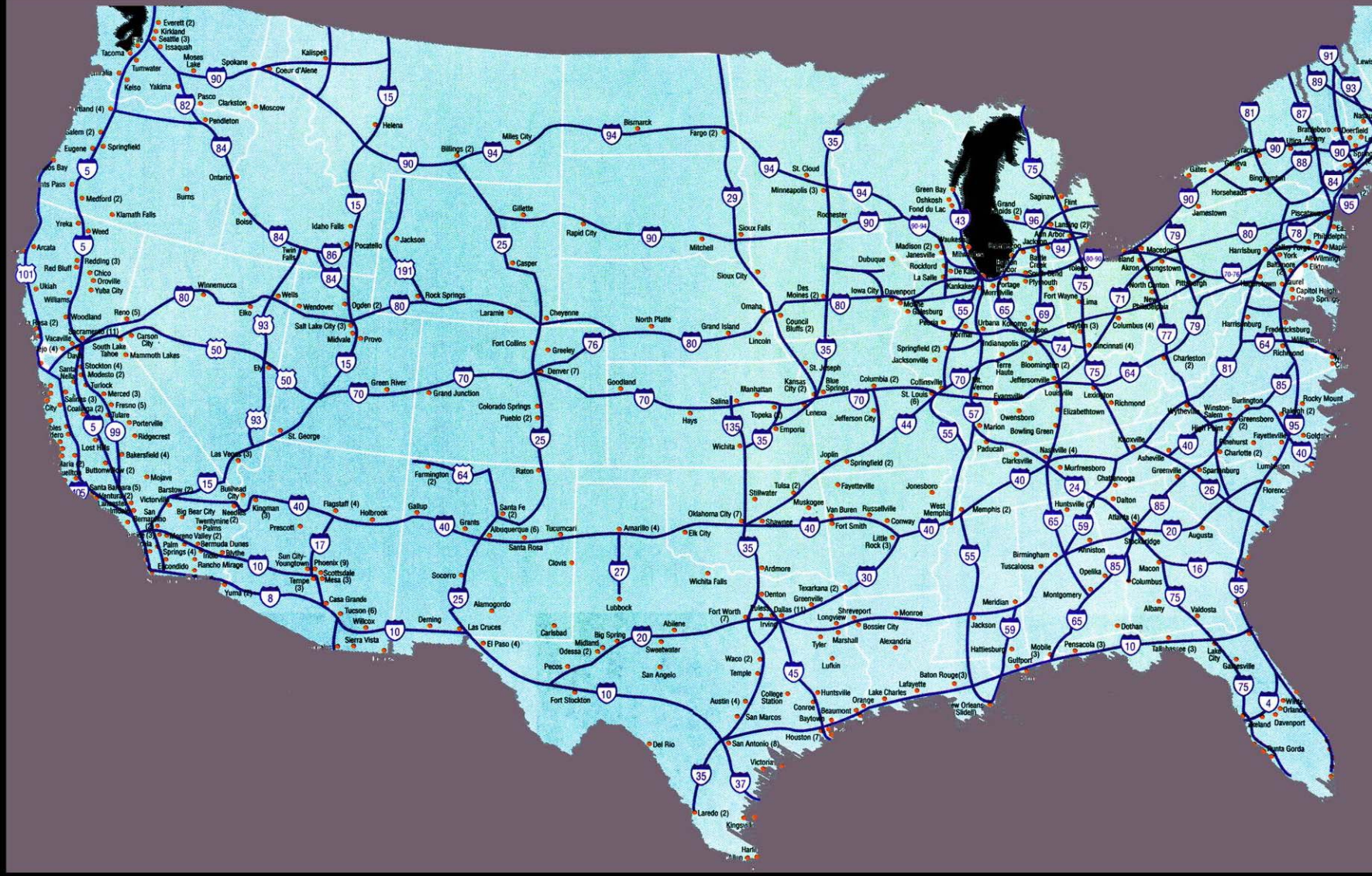
Over 300,000 MW of Wind
In US Transmission Queues



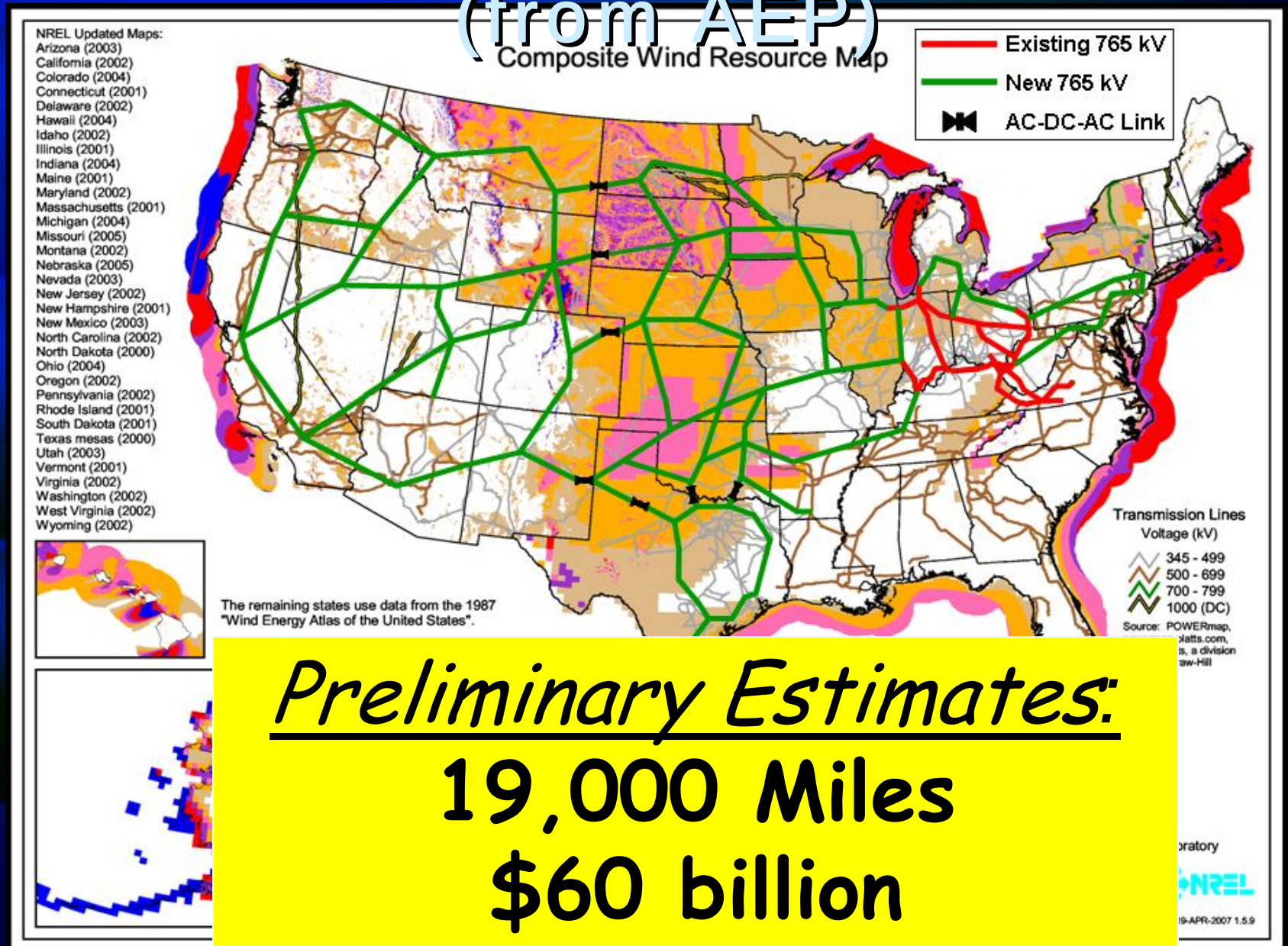
Resources aren't near Loads

A Long Term Vision...

A National Backbone Grid



One Draft Concept… (from AEP)



Preliminary Estimates:

19,000 Miles

$60 billion

Checklist if a Developer Calls…

Does the Developer have what it takes?

- **Experience:** *Have they ever completed a wind project?*
- **Financing:** *Are you being asked to "fund the dream"?*
- **Transmission:** *Interconnection requests? Timing?*
- **Market:** *Is there a customer for the power?*
- **Environment:** *Can the project be permitted?*
- **Cost:** *Are the cost estimates realistic?*

A Final Note

Rural Utilities Services support has been invaluable

Thank you, RUS