Upper Great Plains Region Wind Energy Programmatic EIS

Public Scoping Meetings
September 30 – October 2, 2008

Western AREA POWER ADMINISTRATION

U.S. FISH & WILDLIFE SERVICE

Argonne NATIONAL LABORATORY

Overview of the NEPA Process

- Why is this EIS being prepared?
  - NEPA requires that an EIS be prepared for major federal actions with a potential for significant impacts on the environment.
  - Western and the Service have determined that a programmatic EIS is appropriate to evaluate establishing specific programs and policies related to wind energy within the Upper Great Plains Region.
- What is a Programmatic EIS?
  - A Programmatic EIS evaluates the environmental impacts of broad agency actions, such as the development of programs or the setting of national policies.
  - It does not evaluate specific projects.
  - Instead, it considers:
    - Generic impacts of actions – in this case, of wind energy development and connection to the energy grid, and
    - Potentially applicable mitigation measures.

What Is the Proposed Action?

- Establish a comprehensive environmental program for evaluating proposed wind-energy projects that would connect to Western's transmission systems and/or that would be placed on Fish and Wildlife Service wetland or grassland easements in the Upper Great Plains Region.
- Identify mitigation strategies, standard construction practices, and best management practices to reduce potential environmental impacts.

What would be accomplished?

- Programmatic Endangered Species Act Section 7 consultation with resulting Programmatic Biological Opinion.
- Programmatic National Historic Preservation Act Section 106 consultation for cultural resources.
- Government-to-government consultation with Tribes.

What Alternatives Will Be Analyzed in the PEIS?

At least three alternatives will be considered:

- The proposed action;
- A *no action* alternative (existing situation wherein new proposals are evaluated on an *ad hoc* basis)
- An alternative that consists of Western's proposed action for evaluating wind projects, but would not allow further wind development on any of the Service's easements.
- Additional alternatives may be identified through the public scoping process.

What is Scoping?

- Scoping is the first phase of public involvement in an EIS. It is a part of the process by which the Agencies gather information regarding the:
  - Proposed action,
  - Alternatives to be considered,
  - Significant issues to be analyzed,
  - Possible mitigation measures,
  - Availability of data relevant to the analyses, and
  - Interested individuals and organizations and their specific concerns.

Public Involvement Opportunities

- Public Scoping
  - September 11 through November 10, 2008
- Draft EIS Review and Comments
  - Fall/Winter 2009
- Public Hearings on Draft EIS
  - Fall/Winter
- Review of Final EIS
  - Summer 2010

Project Website

http://plainswindeis.anl.gov

- Information on the EIS process
- Information on wind energy resources and technologies
- EIS-related documents
- Project schedule and project updates
- Online comment forms
- Email notification sign-up
- Contact information

Tonight's Speakers

Nick Stas

Western Area Power Administration

Upper Great Plains Customer Service Region

Lloyd Jones

U.S. Fish and Wildlife Service

Division of Refuges

Karin Sinclair

National Renewable Energy Laboratory

National Wind Technology Center

Western Area Power Administration Upper Great Plains Region Programmatic Wind Energy EIS

Nick Stas
Regional Environmental Manager
Upper Great Plains Customer Service Region
Western Area Power Administration

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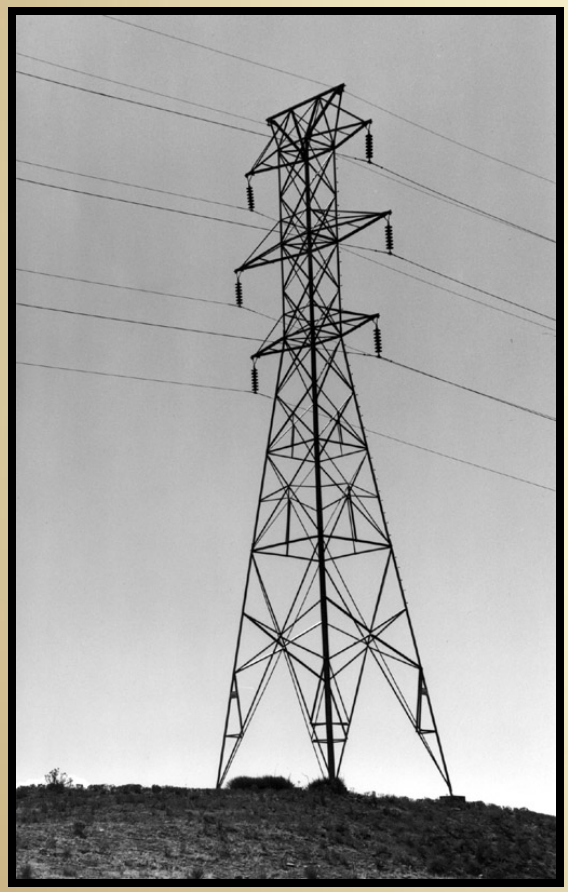
What is Western?



- DOE agency
- Wholesale electricity supplier
- 457 long-term firm power preference customers when agency formed in 1977

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Power marketing administrations

	Transmission Lines (miles)	Substations (all voltages)	Number of Powerplants	Installed Capacity (MW)	Number of Customers	Total Revenue (millions)	Sales (billions of kWh)
Bonneville	15,364	236	31	20,445[4]	149	$3,412[3]	66.7
Southeastern	N/A	N/A	22	3,392	493	$220	8.7
Southwestern	1,380	24	24	2,182	103	$111.2	6.3
Western	**17,008**	**296**	**57**	**10,395**	**671**	**$820**	**38.9**

1. Plants are primarily owned by the Federal government and operated primarily by the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation. Production is marketed by the power marketing administrations.
2. Includes firm and nonfirm power customers and project use customers.
3. Reflects only power and transmission revenues associated with firm/nonfirm sales, less an Statement of Financial Accounting Standards Mark-to-Market adjustment, plus a trading floor bookout; excludes revenues for wheeling of power to others, etc.
4. Nameplate rating from BPA's "White Book" on loads and resources.

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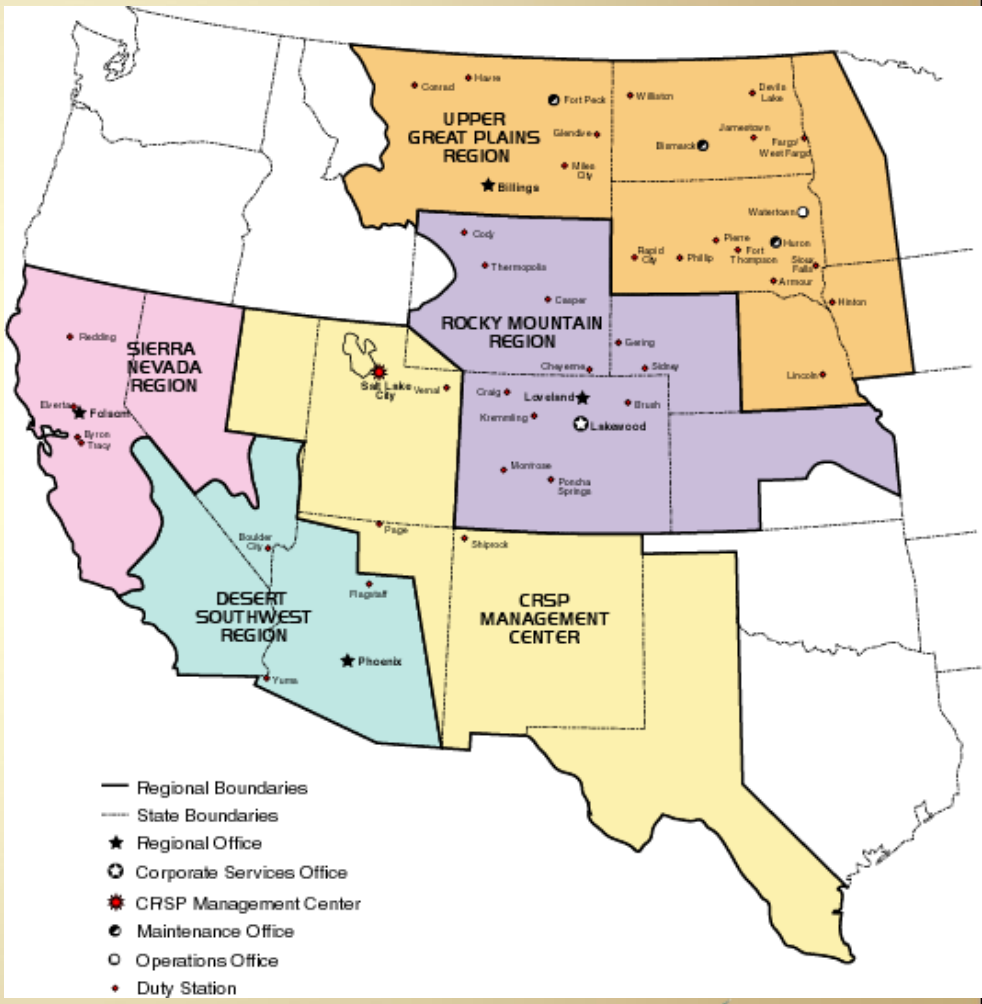
Service territory

Western serves customers from 4 regional offices and the Colorado River Storage Project Management Center



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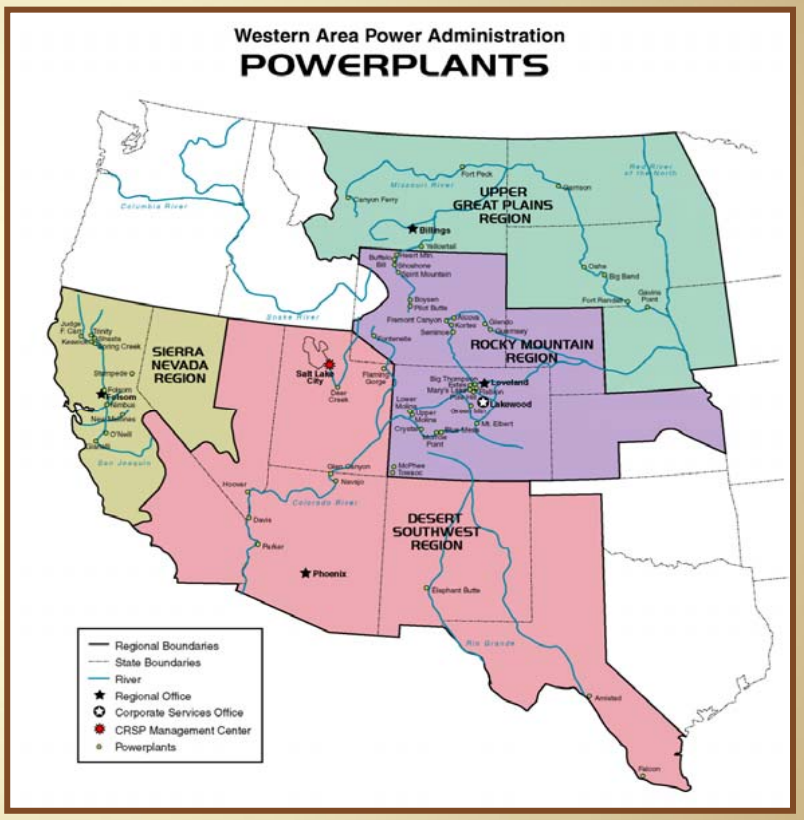
Where does our power come from?

- Hydroelectric energy produced at Federal generating agencies
- Multi-purpose projects
- Affected by variable water availability



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Bulk wholesale transmission

- 17,000 miles of high-voltage transmission lines in 15 states
- Delivers high-voltage wholesale power to local community-owned utilities at cost

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Customers

- 671 customers today
  - Cities and towns
  - Rural electric cooperatives
  - Irrigation districts
  - Public power districts
  - Federal and state agencies
  - Native Americans
- Preference entities under the 1939 Reclamation Project Act

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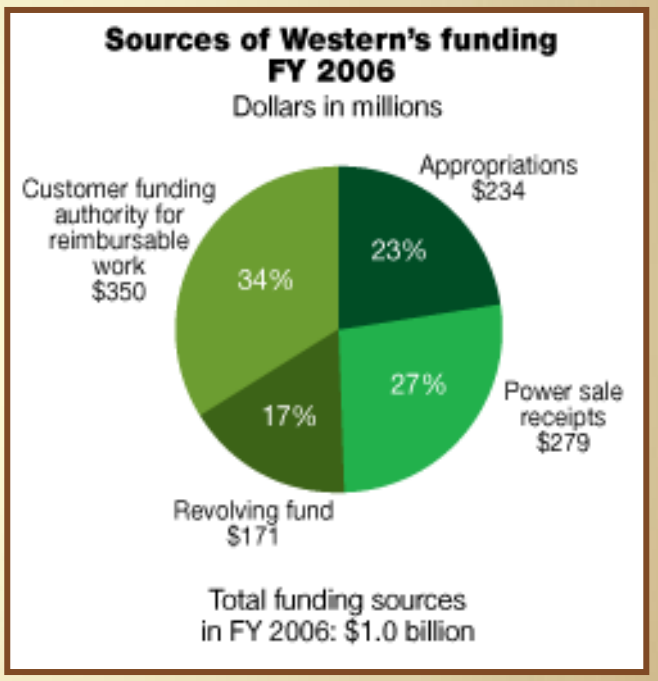
How we're different

- Federal agency funded by Congressional appropriations, customers
- Cost-based rates
- Repay U.S. Treasury
- Voluntarily comply with FERC rulings



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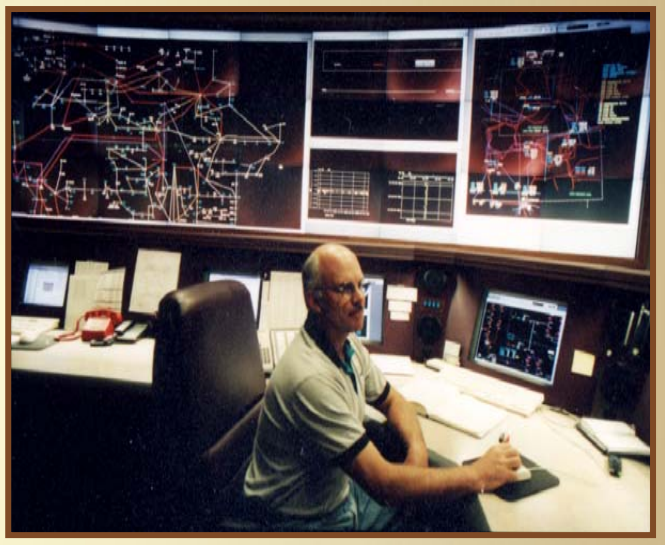
Our role in providing energy

- Market hydropower
- Transmit it to customers
- Control parts of the energy grid
- Manage interties
- Provide open access to transmission
- Evolving to meet the changing power generation and transmission environment



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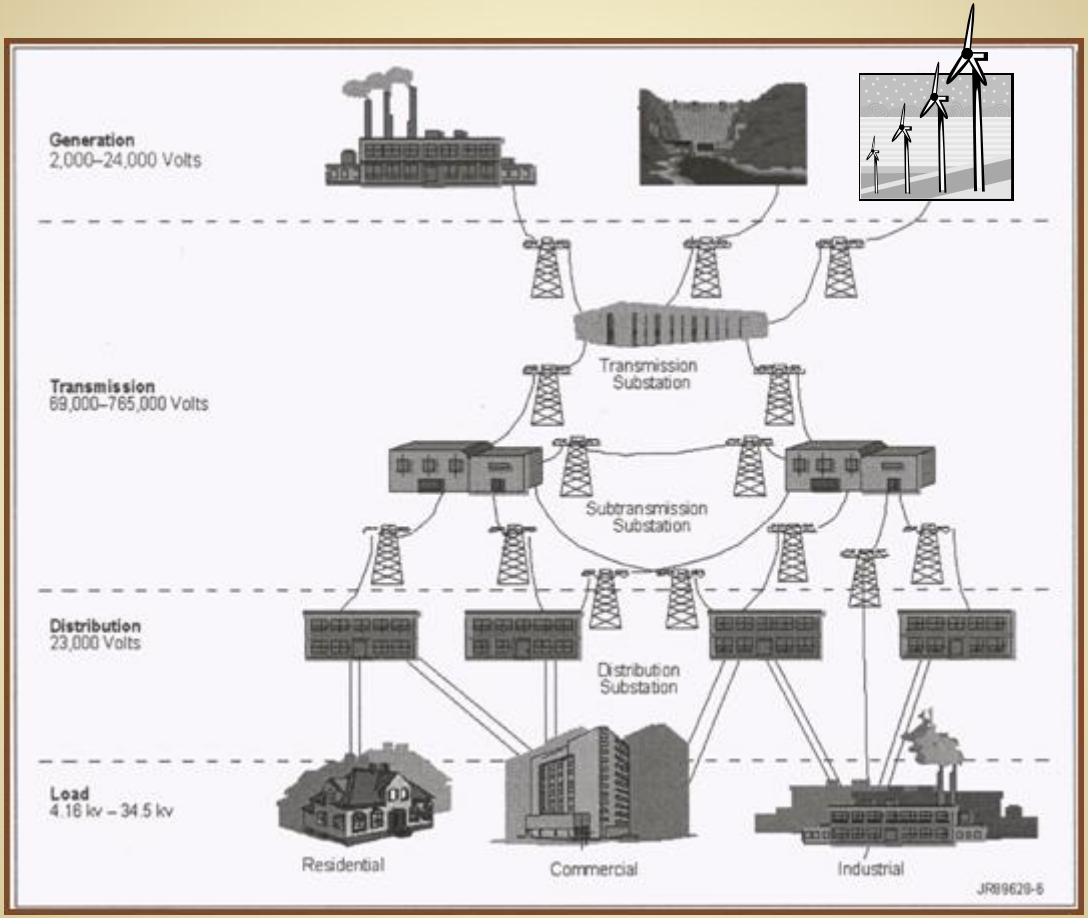
The power grid



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Western and wind energy

- Increasing number of interconnection requests for wind energy projects
- Primarily independent wind project developers
- Currently address requests separately in the order they are received
- Separate NEPA analyses conducted for each interconnection request

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Goals of Western's proposed wind energy program

- Streamline processing of interconnection requests
- Complement Western's Open Access Transmission Service Tariff, which has procedures for addressing wind-energy interconnection requests

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Key programmatic EIS objectives

- Identify and address generic environmental concerns of wind-energy interconnections in order to develop a streamlined approach for future environmental compliance
- Develop and present mitigation measures for use by interconnection applicants
- Implement an adaptive management approach that requires mitigation implementation, monitoring, and reporting
- Complete programmatic consultations for threatened and endangered species and cultural resources
- Consult with tribes in the region
- Provide an easy-to-use guide for interconnection applicants

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THANK YOU!

Additional information may be found at
http://www.wapa.gov

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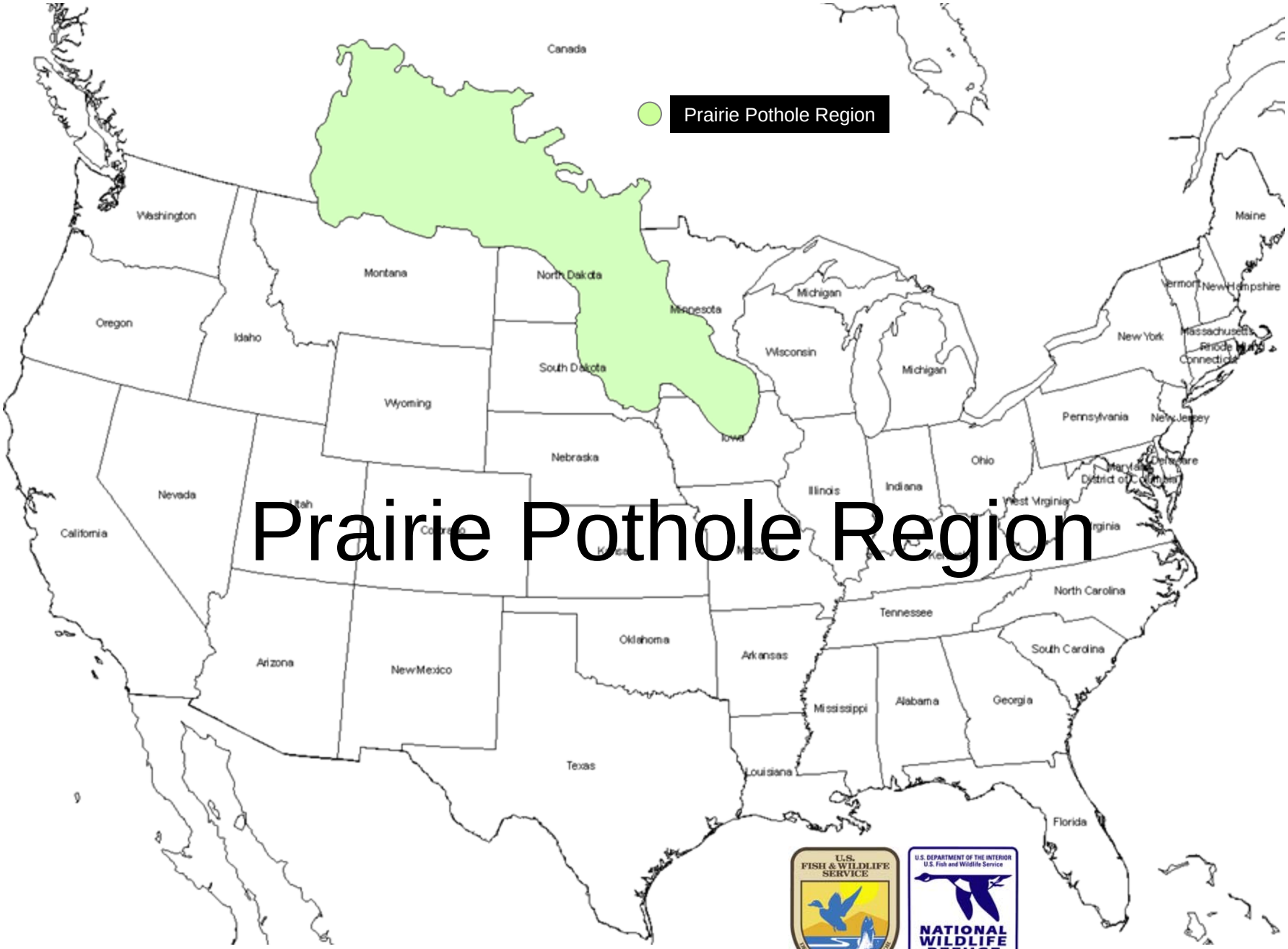
U.S. Fish and Wildlife Service

Mission: ***to work with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.***

Mission of the National Wildlife Refuge System: **administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.**

Prairie Pothole Region



The Prairie Pothole Region is the most productive migratory bird breeding habitat in North America

Grass is being converted to cropland

Wetlands are being drained

Conservation Strategy
Prairie Pothole Region

Protect wetland and grassland habitat in the Prairie Pothole Region sufficient to sustain 93% of the current breeding population and productivity of waterfowl

Conservation Strategy Acreage Goals Prairie Pothole Region

- 1.4 million acres of wetland
- 10.4 million acres of grassland

Conservation Wetland Easements

- Protects wetlands from being drained, burned or filled
- Land remains in private ownership
- Easement continues with change in land ownership -perpetual
- All other uses of wetlands are allowed – farming, haying, hunting

Conservation Grassland Easements

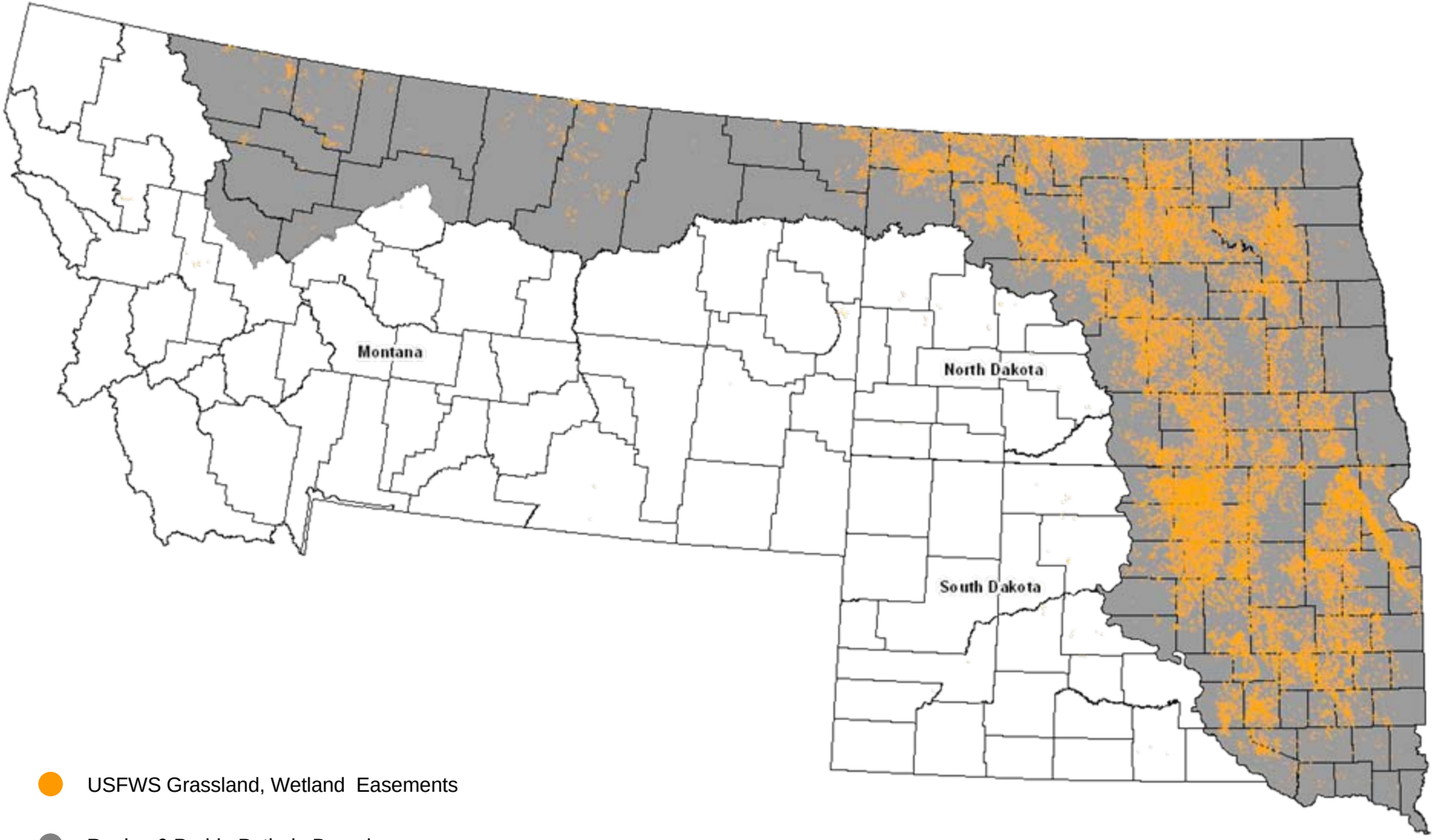
- Protects grasslands from being converted to other uses
  - Can be grazed at any time
  - Can be hayed after July 15
- Land remains in private ownership
- Easement continues with change in land ownership - perpetual
- All other uses of grasslands are allowed – hunting, other recreation

226x, 1-3
Wetland and Grassland Easement

FWS Conservation Easements (acres) ND, SD, MT

	Wetland	Grassland	Total
ND	912,320	303,001	1,215,321
SD	534,054	786,233	1,320,287
MT	32,954	147,755	180,709
TOTAL	**1,479,328**	**1,236,989**	**2,716,317**

Distribution of FWS Conservation Easements



USFWS Grassland, Wetland Easements

Region 6 Prairie Pothole Boundary

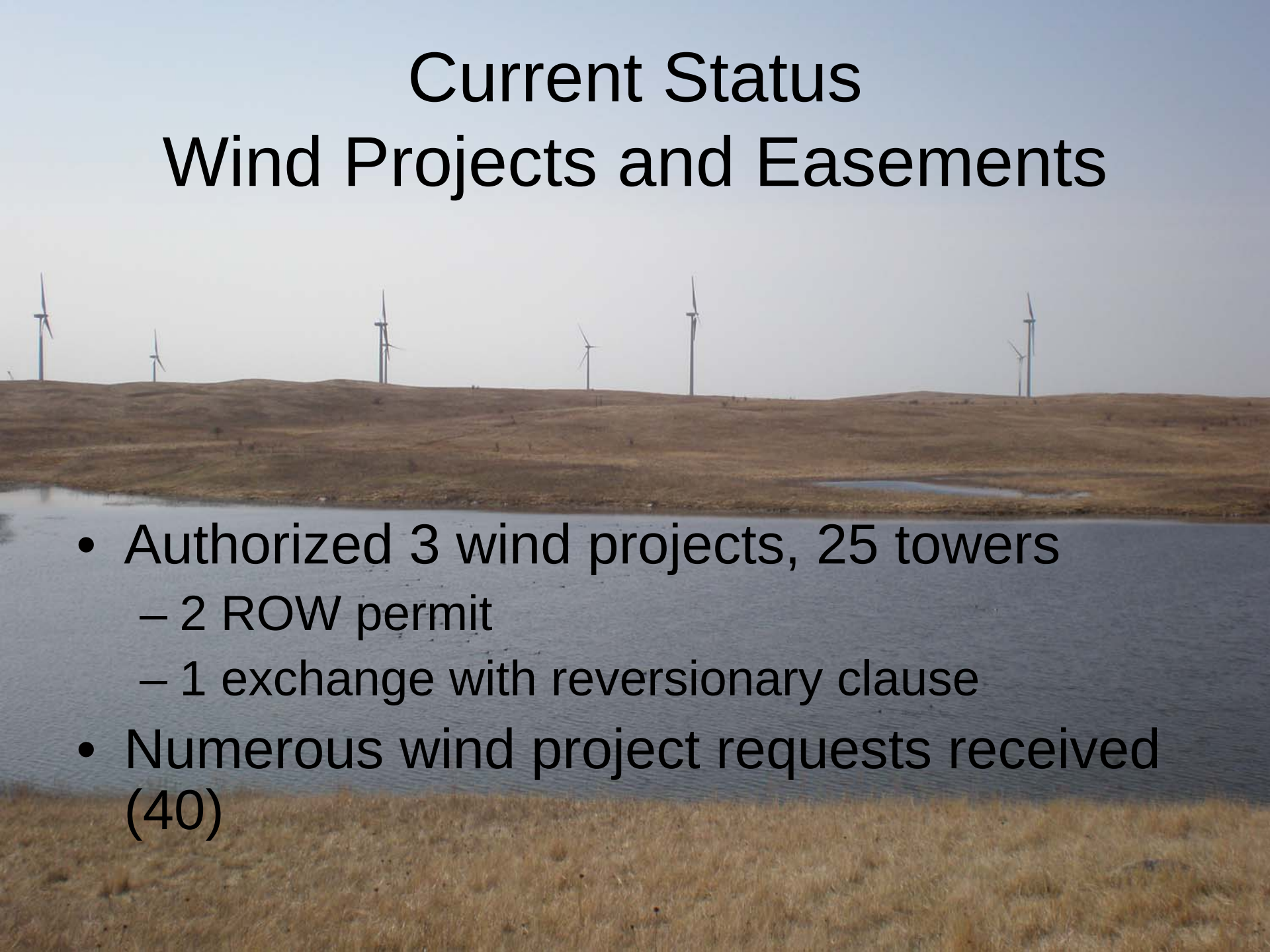
The Challenges We Face

- Wind development expanding rapidly
  - Difficult to avoid existing easements
- Overlap with priority wetlands/grasslands
  - Need to have ability to acquire new easements
- Understanding the interaction of wind and wildlife
- Wildlife, wind and easements, the right mix

Requested Uses

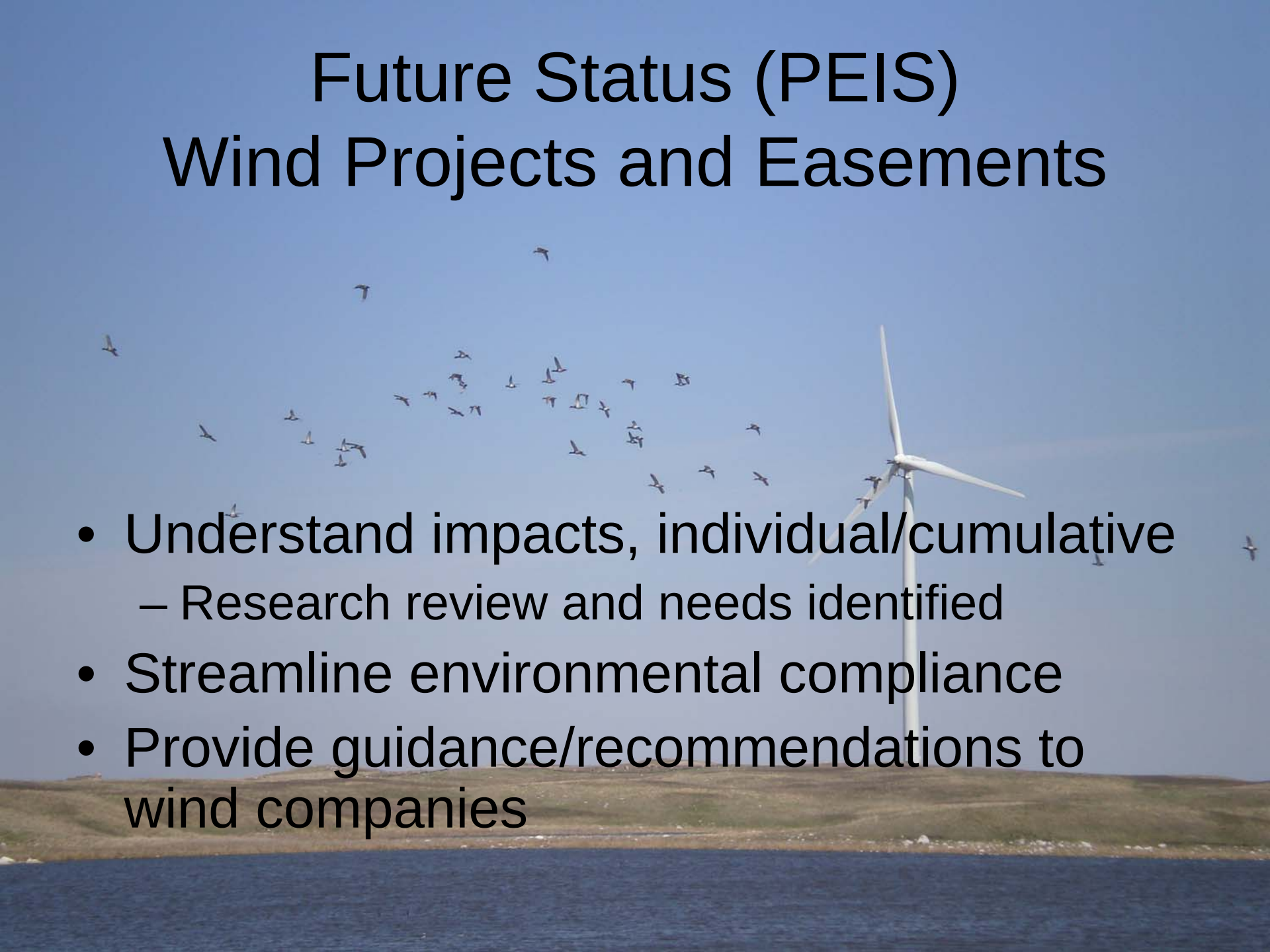
- Examples are: pipelines, powerlines, buildings, roads, wind development
- Each use evaluated under set criteria (flow chart)
- Must also meet NEPA, NHPA other FWS policies (Appropriate Uses and Compatibility)
- General guidance is “reasonable accommodation”

Current Status
Wind Projects and Easements



- Authorized 3 wind projects, 25 towers
  - 2 ROW permit
  - 1 exchange with reversionary clause
- Numerous wind project requests received (40)

Future Status (PEIS)
Wind Projects and Easements



- Understand impacts, individual/cumulative
  - Research review and needs identified
- Streamline environmental compliance
- Provide guidance/recommendations to wind companies

The End

Wind Technology

Presentation for the Upper Great Plains Wind PEIS Public Scoping Meetings

By Karin Sinclair
National Wind Technology Center

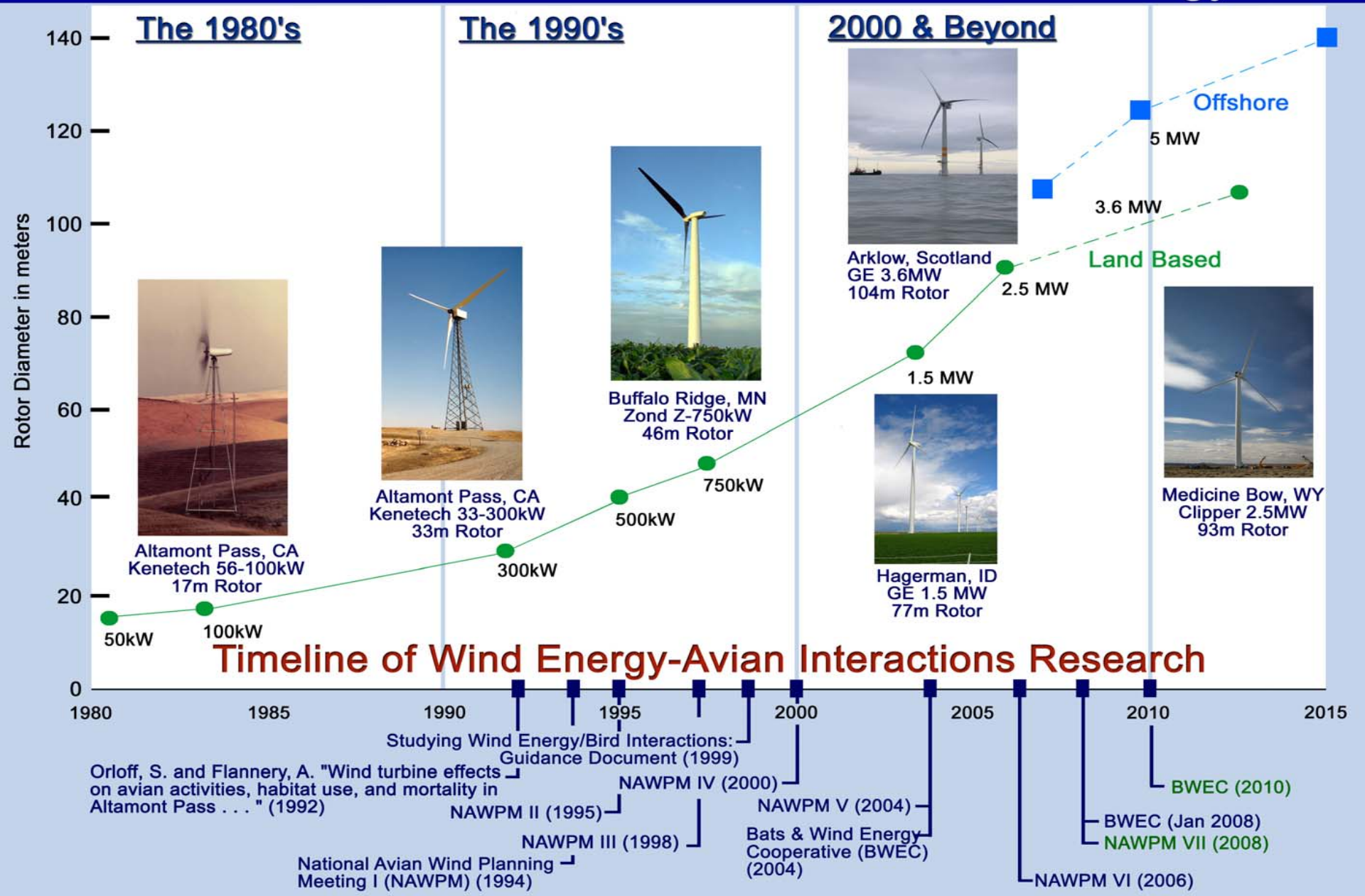
September 30, October 1, October 2, 2008

Presentation Outline

NREL PIX 15404. Tatanka Wind Energy; Straddling the North Dakota / South Dakota border on the Coteau des Prairies Ridge. 120 Spanish built Acciona AWP 1.5-77 1.5MW

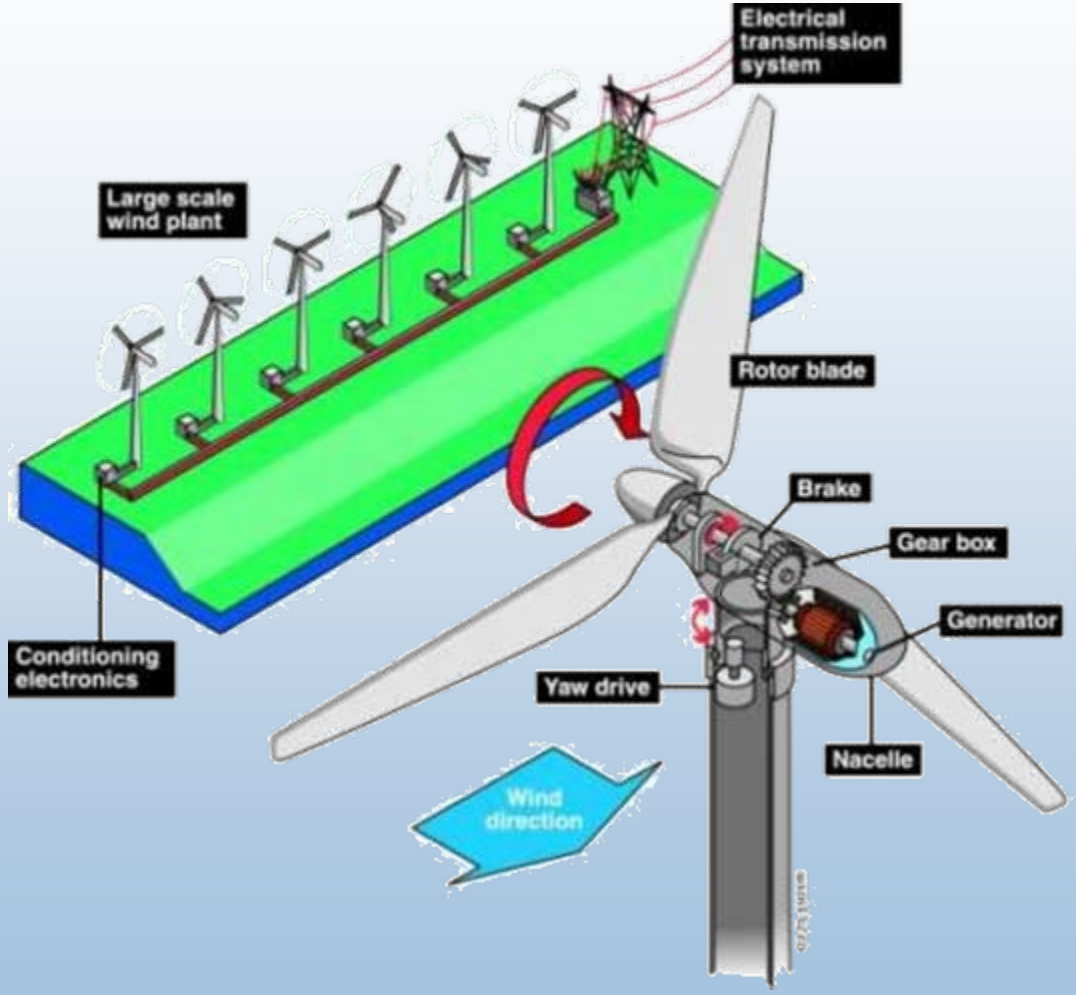
- Technology
- Capacity Installed
- Project Configuration
- Transmission and Operational Issues
- Benefits
- Environmental Issues

Evolution of U.S. Commercial Wind Technology

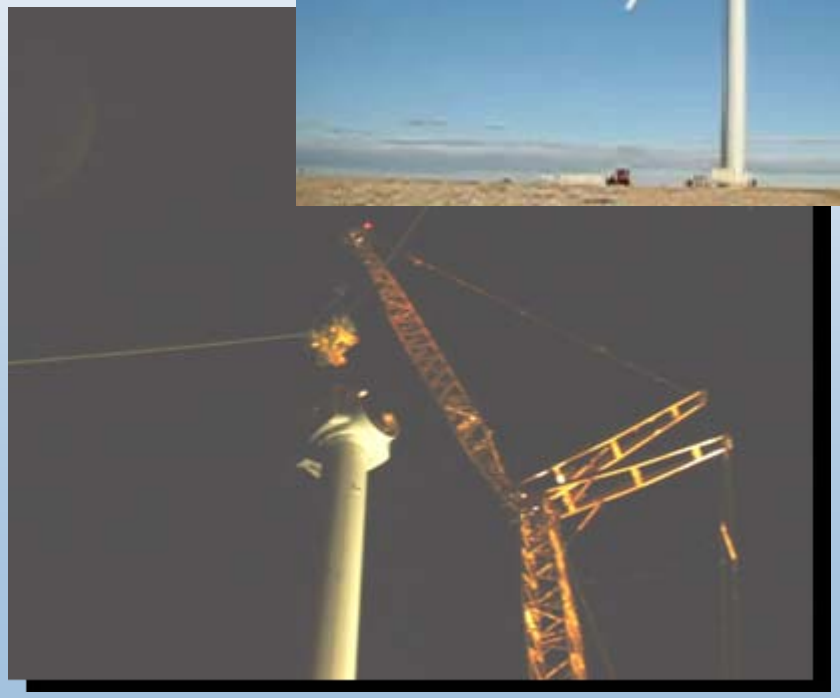


Wind Energy Technology

At its simplest, the wind turns the turbine's blades, which spin a shaft connected to a generator that makes electricity. Large turbines can be grouped together to form a wind power plant, which feeds power to the electrical transmission system.

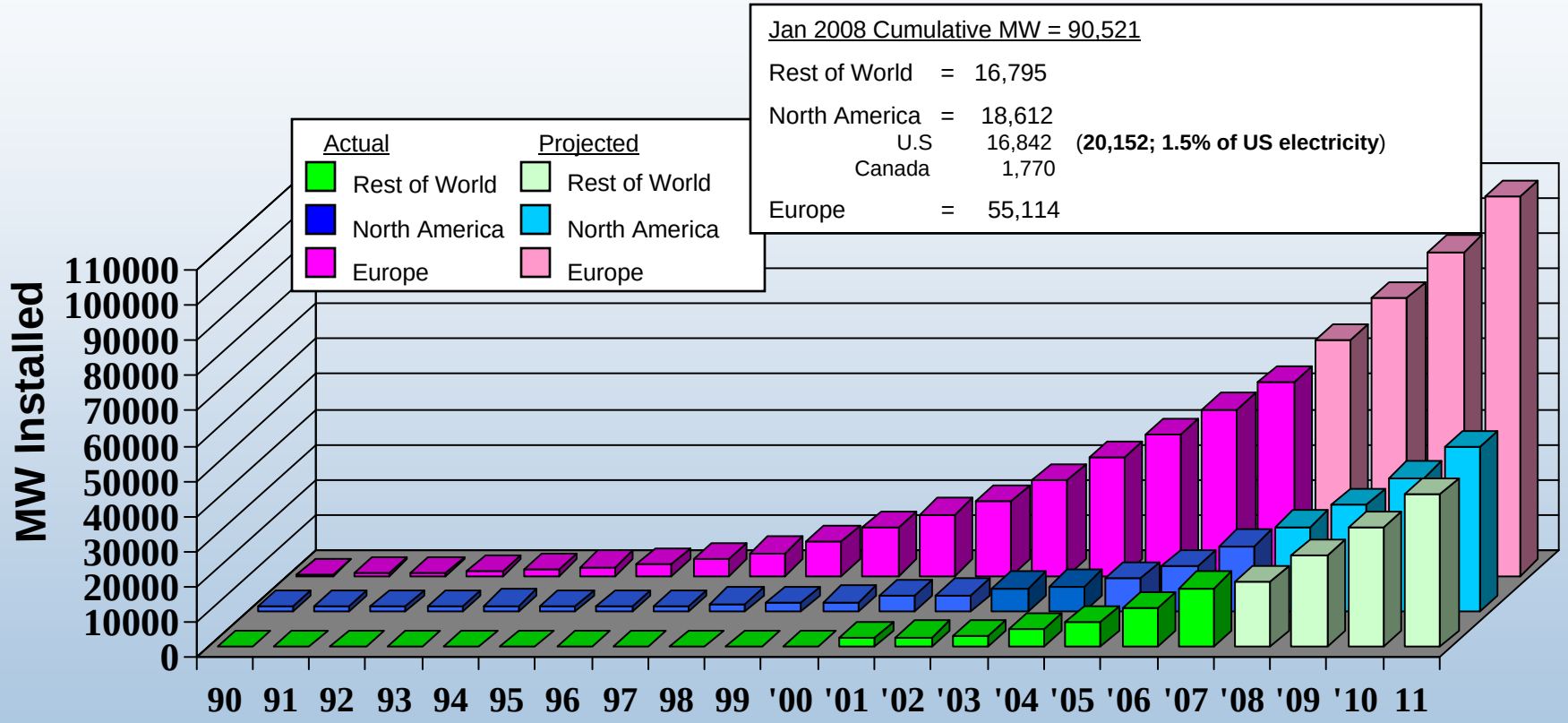


Clipper LWST Prototype
2.5 MW with 93 m Rotor

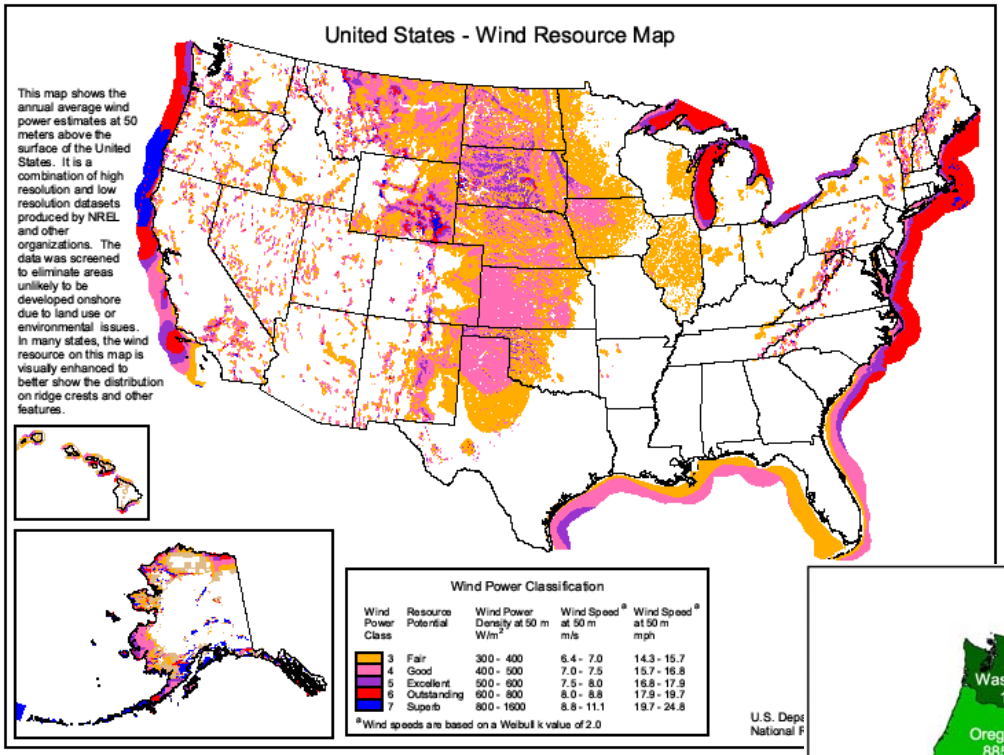


Optimized for Wind Class 3/4

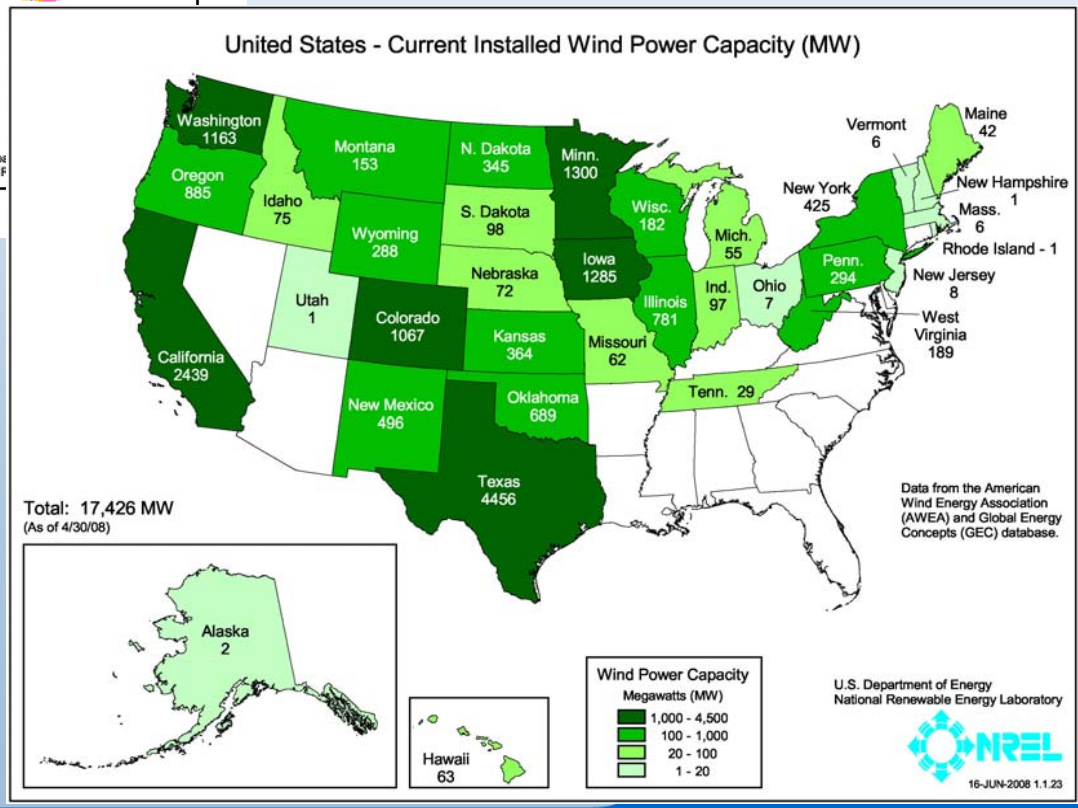
Growth of Wind Energy Capacity Worldwide



Sources: BTM Consult Aps, March 2007
Windpower Monthly, January 2008
*NREL Estimate for 2008

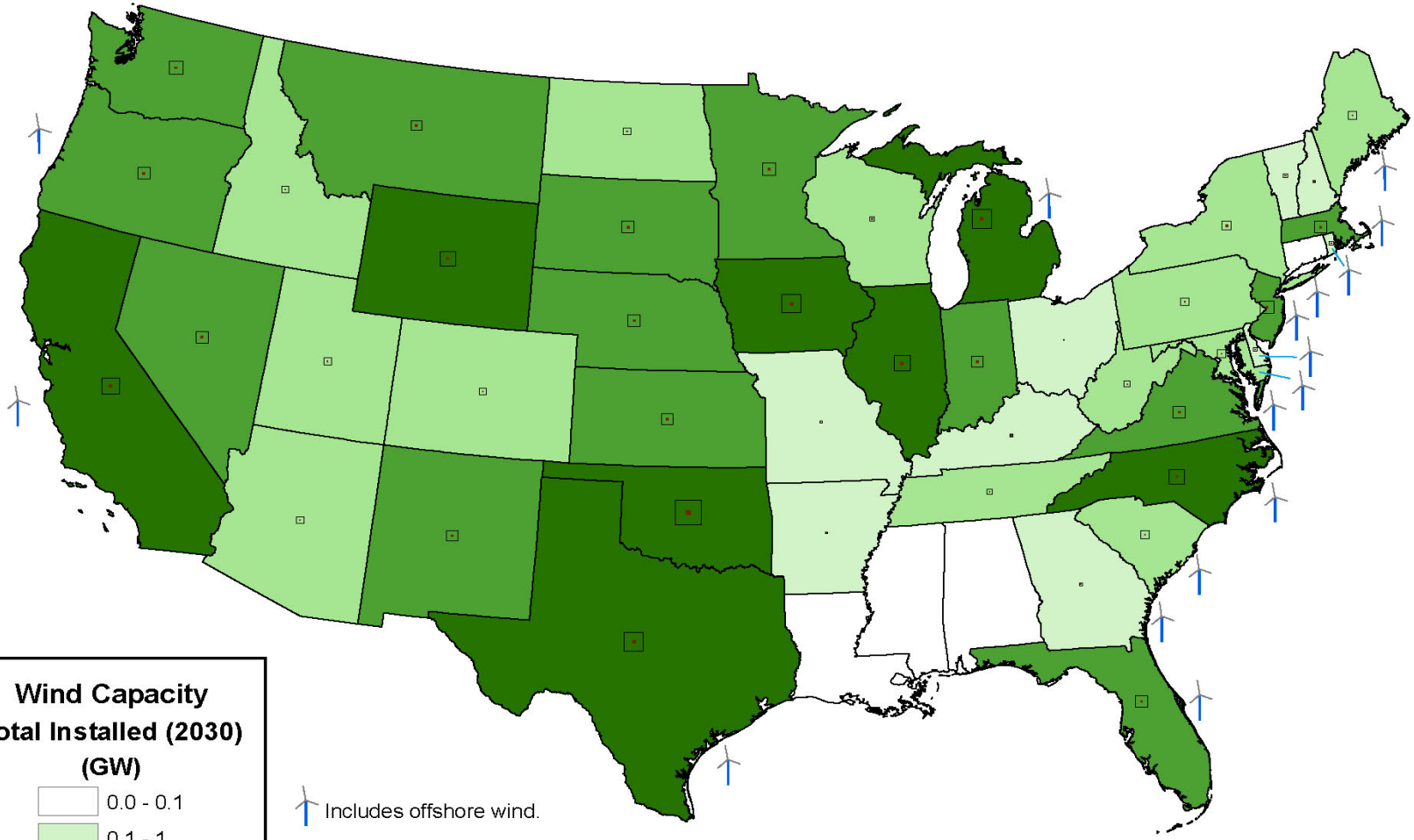


US wind resource compared to installed capacity



Opportunities to exploit indigenous resource: 20% US electricity needs met by wind by 2030

Installed Wind Nameplate Capacity by State (2030)



Wind Capacity Total Installed (2030) (GW)

- 0.0 - 0.1
- 0.1 - 1
- 1 - 5
- 5 - 10
- > 10

Includes offshore wind.

The black open square in the center of a state represents the land area needed for a single wind farm to produce the projected installed capacity in that state. The brown square represents the actual land area that would be dedicated to the wind turbines (2% of the black open square).

20% Wind 06-19-2007

Fig 1-6

Wind Project Configuration

- Turbines are typically 3-bladed up-wind; 2.2MW avg size ‘07
- Tower size varies: ranges from 80m – 150m
- Layout varies depending on wind regime, land, size of turbine, etc. Rule of thumb 2 - 3 rotor diameters to wind direction; 10 rotor diameters between rows
- Project uses about 4% of land

- Power generation dependent on capacity of turbine, capacity factor, wind regime, etc.
  - Assuming avg wind regime, consumption: 1MW = 225 to 300 households

NREL PIX 15520: City of Adams, Minnesota
Micon 1.5 MW

Considerations for Siting a Wind Farm

- Income = Energy Output ~ (Wind Speed)^3
- Transmission Access
- Power Purchase Agreement with Utility
- Land with Landowner Willing to Lease
- Permits: Minimal Wildlife & NIMBY
- Turbines at a Competitive Price
- Financing

NREL PIX 14371. Judith Gap Wind Energy Center in Montana; comprised of 90 GE 1.5-MW turbines

Transmission and Operational Issues

- Transmission availability constrained
  - Regulated by FERC
- Intermittency manageable
  - No spinning reserve required for Lamar project (106 1.5MW)
- Operational issues: gearbox reliability and blade failures

NREL PIX 14819. Blairsburg, Iowa in Webster and Hamilton counties. Comprised of 100 GE 1.5SE 1.5MW turbines and 35 Mitsubishi MWT-1000 1.0MW turbines.

Wind Energy Benefits

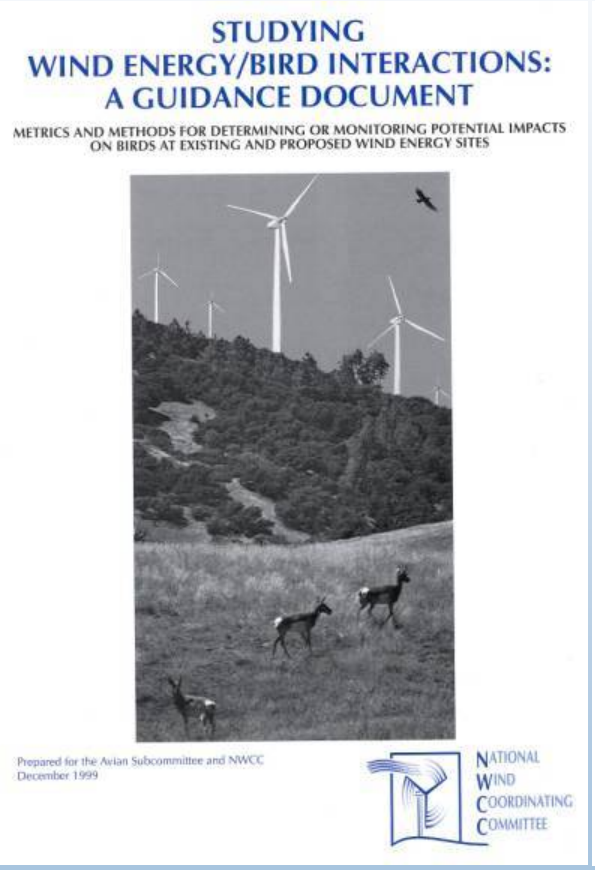
NREL PIX 15299. Ainsworth, Nebraska comprised of 36 Vestas 1.65 MW turbines, for a total capacity of 59.4 MW

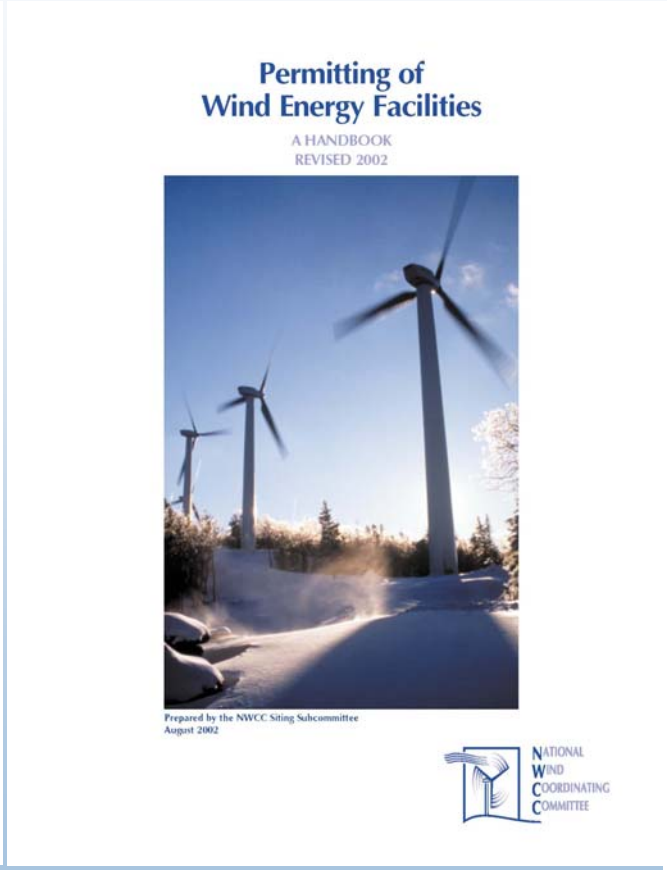
- Economically competitive
- Crop for farmers and ranchers
- Doesn't use water
- National security attributes (indigenous)
- Inexhaustible (renewable)
- Environmental benefits (no emissions)
- Fuel is free; reduces risk of volatile fossil fuel prices
- Variety of applications (can power homes, businesses, farms/ranches; hybrid applications; remote applications, such as water pumping; community projects such as schools, tribes, municipal utilities, rural electric cooperatives

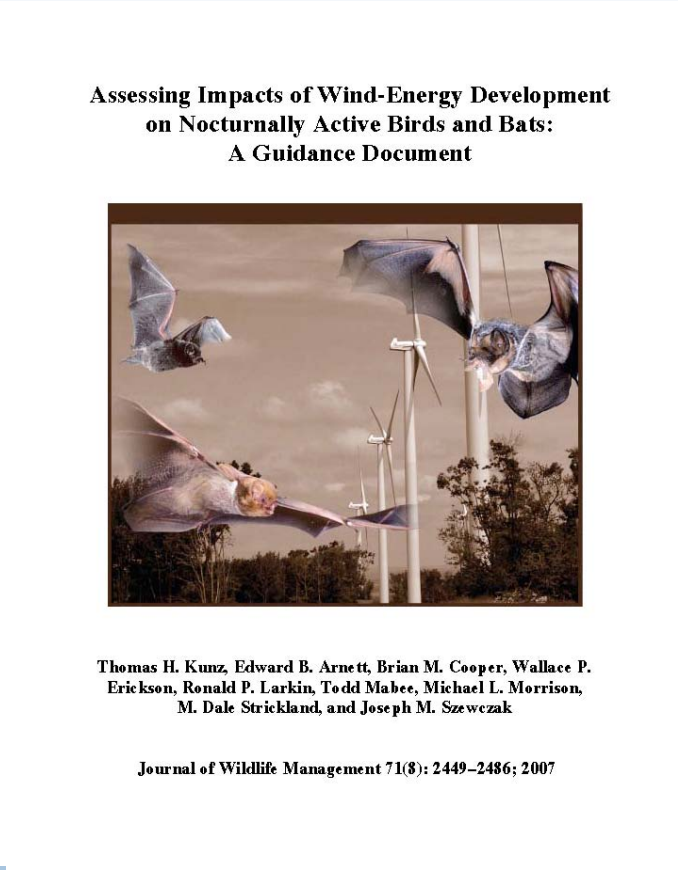
Environmental Issues

- Acoustic
- Aesthetics
- Wildlife
  - Birds
  - Bats
  - Habitat
- Multi-stakeholder approach

Resource Documents







USFWS Voluntary Interim Guidelines (FACA in progress); USFS released guidelines for comment; BLM's PEIS; CEC; NYSERDA; WA; MI; PA; others

Public Scoping Comments

Western AREA POWER ADMINISTRATION

U.S. FISH & WILDLIFE SERVICE

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How to Provide Scoping Comments

There are 3 ways to provide scoping comments:

- At this scoping meeting
- Via the project website: **http://plainswindeis.anl.gov**
- Via mail

Scoping comments will be accepted through November 10, 2008.

Providing Oral Comments Tonight

- Signed up to speak via website or at registration desk
  - Speakers will be called in the order they signed up
  - Unregistered speakers will follow those that signed up
- Making an oral comment:
  - State your name and affiliation
  - Keep comments brief to allow time for all other speakers
  - Limit comments to scope of Programmatic EIS
  - Leave written copies of remarks or any supplemental materials with a PEIS staff member
- Comments will be recorded in transcripts that will be posted on the public Web site.