STATE OF MAINE
LAND USE REGULATION COMMISSION

IN THE MATTER OF DEVELOPMENT	)	Pre-Filed Direct Testimony of
APPLICATION DP 4886	)	Matt Kearns, David Fowler
BLUE SKY EAST, LLC	)	and Geoff West on behalf of
BULL HILL WIND PROJECT	)	Blue Sky East, LLC

On behalf of applicant Blue Sky East, LLC ("Blue Sky East"), Matt Kearns, David Fowler and Geoff West are submitting this pre-filed direct testimony in support of DP 4886 (the "Bull Hill Wind Project" or "Bull Hill").

I. QUALIFICATIONS AND BACKGROUND

A. Matt Kearns

I started my career at First Wind Holding, LLC ("First Wind") in 2006 and I held the title of Director of Development as project developer for the Stetson Wind project before moving to my current role as Vice President of Business Development, Northeast. As Vice President of Business Development, I am responsible for the Northeast development team as they bring projects – including Bull Hill - from concept and due diligence through permitting and into construction and operations. To date, I have overseen the successful development and permitting of wind projects totalling 249 MW in Maine, Vermont and New York. I am a graduate of Colby College and have eighteen years of experience in environmental and energy project permitting and development. My resume is attached as Exhibit A.

B. David Fowler

I hold the title of Development Manager, New England for First Wind and have served in that position since 2008. As lead developer for the Bull Hill Wind Project, I am responsible for all aspects of project development, including initial site identification, site acquisition and

permitting. In addition to being lead developer for the Bull Hill Wind Project, I am also the co-developer of First Wind's Oakfield Wind Project in Oakfield, Maine. I am a graduate of the University of Maine; my resume is attached as Exhibit B.

C. Geoff West

I am the Environmental Permitting and Compliance Manager for First Wind and have served in that position since 2008. I manage the permitting for the Bull Hill Wind Project as well as for other Maine First Wind projects and oversee all environmental permit compliance activities during the construction stage of projects including coordination with the third party environmental inspector and construction contractors. More specifically, I ensure that all permit obligations, such as construction near or in wetlands and vernal pools, construction stormwater plans and seasonal restrictions related to avian activities are adhered to during construction. I have a B.S. in Biology from the University of the South and a M.S. in Environmental Engineering Sciences from the University of Florida. My resume is attached as Exhibit C.

II. FIRST WIND OVERVIEW AND RELATIONSHIP TO BLUE SKY EAST

A. First Wind's National Experience and Relationship to Blue Sky East

First Wind (www.firstwind.com; formerly UPC Wind Partners, LLC) is an independent North American wind energy company focused exclusively on the development, ownership and operation of wind energy projects. First Wind currently operates eight wind energy projects across the country, with a total generating capacity of 534 MW. In addition, First Wind has two projects under construction, including the Rollins Wind Project in Penobscot County, Maine. Project applicant Blue Sky East, developer of the Bull Hill Wind Project, is an indirect, wholly-owned subsidiary of First Wind.

B. First Wind's Track Record Building Wind Power Projects in Maine

First Wind has extensive experience in developing, constructing and operating wind energy projects in Maine, and has constructed, or is in the process of constructing, five grid-scale wind energy projects in the state. First Wind developed, owns and operates the Mars Hill project in Mars Hill and Stetson Wind I and II in Washington County. Operational since March 2007, Mars Hill consists of 28 turbines with an installed capacity of 42 MW and represents Maine's first utility-scale operating wind energy project. Stetson Wind I consists of 38 turbines with an installed capacity of 57 MW and became fully operational in January 2009. Stetson Wind II consists of 17 turbines with an installed capacity of 25.5 MW and became fully operational in March 2010. In the aggregate, the Mars Hill and combined Stetson Wind projects generate approximately 377,000 MW/hours per year.

First Wind's Rollins Wind Project in Penobscot County is under construction and will become operational in the summer of 2011, thus adding 60 MW to First Wind's operation portfolio in Maine. First Wind has also successfully permitted the Oakfield Wind Project in Oakfield, Maine. In addition to the Bull Hill Wind Project, First Wind is currently seeking Commission approval for the Bowers Wind Power Project.

C. First Wind's Financial Capacity

First Wind currently has assets in excess of $1.5 billion. Since 2004, First Wind has raised over $4.5 billion, and since the beginning of 2009, First Wind has refinanced, raised, or received approximately $2.8 billion in more than 20 refinancing and new capital-raising activities and customer prepayments. In 2010, First Wind executed over $1.5 billion in financing and repaid $230 million in short-term turbine supply loans. Financings include $98 million for the Rollins Wind project in Penobscot County, Maine; $76 million for the Sheffield Wind project

in Vermont; $247 million for the 68-turbine expansion of First Wind's Milford Wind project in Utah; and $28 million for the Steel Winds facility in New York.

D. First Wind's Technical Ability

The assembled Project team has a wealth of experience in project design and wind project development. First Wind's extensive team of employees has broad experience in all aspects of wind project development and operation, including generator lead line development, meteorology, engineering, permitting, construction, finance, law, asset management, maintenance, and operations. As noted above, First Wind has successfully permitted five projects in Maine before the Maine Department of Environmental Protection and the Land Use Regulation Commission: Mars Hill, Stetson Wind I, Stetson Wind II, Rollins and Oakfield.

In addition to the First Wind team members, the project team for Bull Hill consists of James W. Sewall Company and RLC Engineering (engineering and electrical design); Stantec Consulting (environmental and permitting); Terrence J. DeWan and Associates (visual); Bodwell EnviroAccoustics (sound); Albert Frick and Associates (soils); TRC, Independent Archeological Consulting and Public Archeology Lab (cultural resources); and Verrill Dana (legal counsel). Each consultant was chosen for their extensive experience in development design and siting of wind energy projects and other projects in Maine.

First Wind's solid track record constructing these projects reflects the company's determination to minimize impacts and comply with all terms and conditions of its regulatory approvals. Working with its engineering teams, and often in consultation with Dave Rocque, the State's Soil Scientist, and LURC representatives, First Wind has constructed three grid-scale projects in Maine and has consistently worked to fine tune its construction techniques to avoid erosion and minimize stormwater impacts.

III. SITE SELECTION OF THE BULL HILL WIND PROJECT

A. Project Design

The Bull Hill Wind Project ("Project") is a 19 turbine wind power project proposed by Blue Sky for the Bull Hill and Heifer Hill ridges in T16 MD, Hancock County. The proposed turbines are Vestas V100 machines with a 1.8-megawatt ("MW") rated power. The turbines will be on 95-meter towers and will have 100-meter rotor diameters. The total height with blades fully extended will be approximately 145 meters (476 feet). The Project will also include up to three 95-meter lattice type permanent meteorological ("met") towers. Full details of the Project are listed in Section 1.0 of the Application, and a visual overview of the Project footprint is attached hereto at Exhibit D.

The power from each turbine will be collected in approximately 8.2 miles of underground 34.5 kilovolt ("kV") collection lines and will flow to a new substation and operations and maintenance ("O&M") building located centrally within the Project area. The substation will step the power up to 115 kV and transmit it directly to existing Line 66 on the Bangor Hydro Electric Company ("BHE") transmission system. By locating the substation directly adjacent to Line 66, no new 115 kV generator lead will be necessary for the Project.

For access to the Project existing roads will be utilized to the extent possible. The Project requires only 4.8 miles of new road, and only minor widening and grading modifications will be required for the existing gravel logging road. A more detailed discussion of the road design and impacts can be found in Section 5.0 of the Application.

B. Site Selection Factors

Development of a viable wind energy project depends on fundamental factors such as the characteristics of the wind resource, access to transmission, and landowner interest. In selecting

sites for wind energy development, First Wind also actively seeks to identify locations where impacts to human and ecological resources can be completely avoided or minimized as much as possible. Additionally, attached as Exhibit E is a Table of Key Facts for the Project.

The Bull Hill Wind Project site provides an ideal location for development of a wind energy Project. First, the Project will be the lowest elevation wind site proposed in Maine to date. It will be built on two low ridgelines, Bull Hill and Heifer Hill, with elevations between 450 and 624 feet. As a result, construction of the roads connecting turbines will not require substantial cut and fill. Second, although low in elevation, the average wind speed generated is 7.2 meters per second, which is a Class II/III resource. Third, the Project is located adjacent to the existing Bangor Hydro Electric 115 kV transmission line and, as a result, a generator lead typically associated with wind power projects is not required here. Fourth, the Project has been designed to use existing logging roads wherever feasible and, as a result only 4.8 miles of new road is required. Further, due to the depth of gravel above bedrock in the project area, the 8.2 mile 34.5 kV collector line will be constructed underground and within the existing road network, thereby avoiding any visual or wetland impacts associated with overhead transmission lines.

Finally, the Bull Hill Wind Project site is located within the expedited area for permitting purposes. In May of 2007, then Governor Baldacci convened a Task Force on Wind Power Development in Maine (the "Task Force") for the purpose of advancing the development of wind power in Maine. See February 2008 Report of the Governor's Task Force on Wind Power Development (the "Task Force Report") at Exhibit F. The Task Force included legislators, representatives from regulatory agencies, industry representatives, and several environmental organizations. See Attachment B to Task Force Report.

In response to the Task Force Report, the Maine Legislature identified certain areas in LURC jurisdiction that were appropriate for wind power development as a permitted use. See 12 M.R.S.A. § 685-B(2-C). The Bull Hill Wind Project is located in this "expedited permitting area" and this legislative determination was an important factor in Blue Sky East's site selection process.

A summary of the key siting criteria the Project, as well as references to more extensive discussions regarding each is described in Table 1 below.

Table 1

Siting Criterion	Description/Reference
Wind Resource	7.2 Meters/Second-Between Class II/Class III Application, Table 1,p. 4
Base Elevation	Low-450 to 624 feet above sea level, Application, Section 1
Transmission Line Access	Adjacent to Project (no new 115 kV line required) Application, Section 1
Collector Line	Underground (8.2 miles) Application, Section 1
Access Roads	Largely Utilizing Existing Logging Roads (4.8 miles of new road); Application, Table 1, p.5
Permitting Status	Expedited Permitting Area Application, Section 1

As described in greater detail in Sections 11-15 of the Application and in the testimony provided by Brooke Barnes, Adam Gravel and Dale Knapp of Stantec Consulting, the Bull Hill Project has also been carefully designed in a location and manner to avoid or minimize potential ecological and human impacts to the maximum possible extent. First, construction of the Project will not result in **any** temporary or permanent impacts to wetlands. Second, the Project will not impact any Significant Wildlife Habitat, Deer Wintering Areas, Inland Waterfowl and Wading Bird Habitat, or rare, threatened or endangered species, including the Northern Bog Lemming,

the Roaring Brook Mayfly or the Spring Salamander. Third, the predominant forest type in the Project area is a commonly occurring, regenerating, Beech-Birch-Maple Forest. Fourth, only a portion of one resource of state or national significance is located within three miles of the Project and, based on visual simulations and user surveys, will not have an unreasonable adverse effect on scenic values of and existing uses of scenic resources of state or national significance. Fifth, the closest non-participating dwelling is located approximately 3,880 feet from the nearest turbine. Further, impacts to avian, raptors and bats are expected to be consistent with other projects in Maine. Finally, there will be no shadow flicker impacts to residences or camps.

Because stakeholder involvement is another key factor in the development of any wind project, First Wind conducted extensive outreach in the local communities surrounding the project, including numerous meetings with residents of Eastbrook, and a widely-advertised public open house. First Wind also met with local community groups, including snowmobile clubs, ATV clubs, and conservation groups such as the Downeast Salmon Federation and Maine Audubon. Finally, First Wind met with local business leaders involved in such groups as the Ellsworth Area Chamber of Commerce and the Ellsworth Rotary Club, and also met with the Hancock County Commissioners.

A summary of the key ecological/human siting considerations and the minimal impacts of the Project, as well as references to more extensive discussions regarding each, is provided in Table 2 below.

Table 2: Environmental Considerations

Resource	Impact/Reference
Wetlands	No Impacts Application, Table 1, page 4.
Clearing/Forest Type	Beech-Birch-Maple—(MNAP S4-Common in Maine); Application, Exhibit 12A
Significant Wildlife Habitat	None in Project Footprint Application Section 12A
Rare/Threatened/Endangered Species	None in Project Footprint Application, Exhibit 12A
Residences	Closest non-participating dwelling is 3,880 feet from nearest turbine Application, Exhibit 17
Shadow Flicker	No impact to residences or camps. Application, Exhibit 21
Visual	No Unreasonable Adverse Effect Application, Exhibit 18

V. TANGIBLE BENEFITS

A. Environmental and Energy Benefits of Wind Power

Electricity generated from wind energy projects produces zero air or water pollution and displaces generation from more costly and polluting sources. The environmental benefits of wind energy, including avoided air pollution, waste disposal problems and hazards to human health from emissions, waste and by-products, are presumed under the Wind Energy Act. See 35-A M.R.S.A. § 3402(1). In addition, Maine and the region have set aggressive greenhouse gas reduction goals, and State and regional experts including the Maine Public Utilities Commission ("MPUC") and ISO-NE have concluded Maine and the region cannot meet these greenhouse gas policy goals without significant additions of wind power and other renewable energy sources in Maine and elsewhere in the region. The MPUC has also found that the addition of new wind

power generation facilities in Maine will also lead to lower and less volatile electricity prices. See Application Sec. 22.1.4 and note 7.

B. Economic Benefits

The Bull Hill Wind Project will provide significant tangible benefits to Hancock County and the State of Maine. A full discussion of the tangible benefits is provided in Section 22 of the Application.

In summary, and on the State level, as discussed above, the Project will increase energy diversity, help reduce energy prices, and help Maine and the region meet the greenhouse gas emission reductions goals set forth in State law and the Regional Greenhouse Gas Initiative. See Application Section 22. In addition, wind power projects like the Bull Hill Wind Project represent a bright spot of investment in Maine during what has been an otherwise economically challenging period. According to the Maine Renewable Energy Association, "wind energy projects in Maine, totaling nearly $950 million, already have brought more than $378 million to Maine in job creation, wages, taxes, land conservation programs, and support for basic infrastructure such as ports, engineering & environmental firms, and transportation companies."[1] Attached as Exhibit G is a map depicting statewide benefits from existing wind power projects.

Construction-related benefits are perhaps the most obvious economic benefits associated with wind energy development. And indeed they are substantial. Like all First Wind projects, the Bull Hill Wind Project will hire locally whenever possible. For the Mars Hill, Stetson I and Stetson II projects combined, more than 850 people were employed during the construction phase. A recent study by Charles S. Colgan, PhD concluded that wind power developments result in wages of approximately $182,000 per megawatt of installed capacity. Colgan Report Attached at Exhibit H. The actual economic spending associated with the development and

[1] http://www.windforme.org/economy.htm.

construction of nearby Stetson Wind is evidence of the tangible economic benefits that can be expected from the Bull Hill Wind Project: of the approximately $65 million spent in the development and construction of Stetson I, about $50 million was spent with about 130 Maine businesses. Once operational, the Bull Hill Wind Project anticipates hiring three to eight permanent, full-time employees to operate and maintain the facility. Based on Dr. Colgan's analysis, the Bull Hill Wind Project will result in wages totaling approximately $6.2 million.

At the county level, Blue Sky anticipates that the Bull Hill Wind Project will add approximately $69 million of new property tax value to the unorganized territory of Hancock County, resulting in estimated average tax payment of approximately $342,343 (averaged over 20 years), adjusted by any credit enhancement agreement. Blue Sky is currently negotiating the terms of a tax increment financing ("TIF") agreement with the Hancock County Commissioners. With TIF funds from the Bull Hill Wind Project, Hancock County will be able to fund a wide variety of economic development projects throughout the County's Unorganized Territory. A summary of the taxes and construction-related benefits is provided in Table 3 below.

Table 3: Construction and Tax Benefits.

Benefit	Amount Anticipated from Bull Hill Project
Construction-related employment	Creation of approximately 850 jobs
Construction-related wages	Approximately $6.2 million.
Property taxes	Approximately $69 million in new property tax value to Hancock County, adjusted by TIF

In addition, Blue Sky will satisfy its Community Benefit requirement of $4,000 per turbine per year (35-A M.R.S.A. § 3454(2)) with a package of benefits to the host and adjacent communities. First, Blue Sky expects to execute a Community Benefit Agreement with the

Hancock County Commissioners in an amount that fully satisfies the Community Benefit requirement (i.e, at least $4,000 per turbine per year, or $76,000 annually). In addition, Blue Sky has agreed to make an annual unrestricted payment to the neighboring town of Eastbrook of $20,000 for 20 years.

Finally, Blue Sky East shall make a one-time payment to the Downeast Salmon Federation ("DSF") in the amount of $25,000 for conservation projects in the Narraguagas River watershed. See Application Sec. 22.1.5. A letter from the DSF accepting this grant is attached at Exhibit I. Also, Blue Sky East is finalizing the terms of an agreement with DSF for an additional payment of $20,000 per year for twenty years to establish a fund for the improvement and preservation of water quality in Spectacle Pond, Narraguagas Lake, and the Narraguagas River watershed. A summary of these additional tangible benefits is provided in Table 4 below.

Table 4: Community Benefits Package

Entity	Benefit	Annual Total	20 Year Total
Hancock County Commissioners	$4,000/turbine/year	$76,000	$1,520,000
Town of Eastbrook	$20,000 per year	$20,000	$400,000
Downeast Salmon Federation		N/A	$25,000 lump sum
Downeast Salmon Federation	$20,000 per year	$20,000	$400,000
TOTALS:		$116,000 ($6,105/turbine/year)	$2,345,000 ($123,421/turbine)

VI. CONCLUSION

In conclusion, the Bull Hill Wind Project has been sited in a manner to avoid any significant impacts to environmental, residential or scenic resources. The Project complies with

LURC's regulations for wind energy developments and when operational, will assist the State in meeting its renewable energy goals. First Wind has a proven track record in permitting, developing, and operating grid-scale wind energy projects in Maine and elsewhere in the country. Further, First Wind and Blue Sky East have assembled a team of engineers and consultants who have technical capability to design and construct the Project in an environmentally sound manner. Finally, the Bull Hill Wind Project will result in immediate and direct benefits to the local and regional economy.

We look forward to discussing this Project further with LURC and to answering any questions raised by the Commission, its staff, and the parties to this proceeding.

Date: 4/25/2011

Matthew Kearns

STATE OF MAINE
County of Cumberland

Date: 4/25/2011

Personally appeared before me the above named Matthew Kearns, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,

HPG Iman

Notary Public/Attorney at Law

My commission expires:

Date: 4/22/11

David Fowler

STATE OF MAINE
County of Cumberland

Date: April 22, 2011

Personally appeared before me the above named David Fowler, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,

Deborah Dickinson Milite
Notary Public
My commission expires: _____

DEBORAH DICKINSON MILITE
A NOTARY PUBLIC OF MAINE
MY COMMISSION EXPIRES JANUARY 30, 2017

Date: 4/21/11

Geoff West

STATE OF MAINE
County of Cumberland

Date: 4/21/2011

Personally appeared before me the above named Geoff West, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,

Notary Public
My commission expires: 10/21/2017

Kearns, Fowler, and West Pre-Filed Direct Testimony Exhibits

Exhibit A: Kearns Resume

Exhibit B: Fowler Resume

Exhibit C: West Resume

Exhibit D: Application Figure 1

Exhibit E: Table of Key Facts

Exhibit F: 2008 Report of Governor's Task Force on Wind Power Development

Exhibit G: Maine Businesses Benefitting from Wind Investment

Exhibit H: Colgan Report

Exhibit I: Downeast Salmon Federation Letter

Matthew Kearns

Professional History

2006-Present – VP of Business Development Northeast, First Wind

Mr. Kearns is responsible for First Wind's wind energy project development activities in the northeast. He has successfully developed and permitted 249MW in Maine, Vermont, and New York. 183MW of these project are currently operating or under construction.

2004-2006 – Senior Business Developer/ National Energy Program, Tetra Tech EC

Mr. Kearns was responsible for business development activities for Tetra Tech EC's national energy program focusing on wind energy and other clean energy projects. Mr. Kearns was an active member of the American Wind Energy Association project siting committee.

1999-2004 – Environmental Permitting Lead, FPL Energy

Mr. Kearns was responsible for permitting and managing environmental issues for FPL Energy's fleet of wind energy projects in various stages of development, construction and operation.

1996-1999 – Project Manager, Duke Engineering and Services

Mr. Kearns managed studies and prepared licensing and permitting documents associated with federal relicensing of hydropower projects nationwide with a focus on the northeast and northwestern U.S.

1993-1996 – Project Analyst, Kleinschmidt Associates

Mr. Kearns prepared technical documents, study reports, and regulatory filings in support of relicensing hydropower projects in Maine and New York.

Education

B.A. Colby College, Waterville Maine 1993 - English/ Environmental Studies, Honors

David Fowler
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firstwind
CLEAN ENERGY. MADE HERE

November 2008-Present ***Development Manager, New England,*** First Wind, Portland

David Fowler has been a Development Manager for First Wind in New England since 2008, responsible for all aspects of project development, from site identification, to acquisition and permit application development. During that time, he has secured Right, Title, and Interest for more than 150MW of potential wind generation in the State of Maine. David has also secured the Right, Title, and Interest for a 58-mile generator lead. In addition to being the lead developer for the Bull Hill Wind Project, he is also the co-developer of the Oakfield Wind Project.

2007-1993 ***President and Owner***, Dave Fowler Builder, Inc., Casco, Maine

As President and Owner, David proved himself an accomplished professional in the acquisition, development planning and utilization of raw land for residential and commercial use. Decisive leader and results oriented individual with proven success developing and managing land parcels for multi-million dollar timber and building products company located in the Northeast. Direct experience in a wide range of land development activities including acquisition phase, creation of subdivision and infrastructure development plans, conservation and resource protection plans, all phases of local and state permitting process, supervise construction of roadways and utilities, and marketing and direct sales of finished product. David conducted contract negations with buyers/sellers, secured leases for non-timber assets, developed land acquisition feasibility analyses, oversaw local and state permitting process, controlled all facets of construction, developed and managed budgets and schedules, oversaw road and utility construction, developed resource/conservation plans, and managed crews of up to 50 people.

2007-2005 ***Non Timber Asset Manager***, Hancock Land Company, Casco, Maine
1993-1987 ***Project Manager, Account Manager***, Hancock Land Company, Casco, Maine

Managed construction budgets and schedules, oversaw daily construction operations, managed multiple projects, served as a master carpenter, developed and maintained relationships with trades and professionals, interfaced with local and state officials, and controlled all phases of construction.

EDUCATION

A.A. Forestry Management, University of Maine, Orono, 1981

A.A. Business Management, University of Maine, Orono, 1981

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CLEAN ENERGY. MADE HERE.

November 2008-Present ***Environmental Permitting and Compliance Manager,*** First Wind, Portland

- Currently manage First Wind's permitting and due diligence efforts for Grid-Scale Wind Development in Maine.

January 2007-November 2008 ***Environmental Specialist (I),*** Juno Environmental Services, FPL Energy, Juno Beach, FL

- Managed Permitting and due diligence for natural gas, wind, and transmission projects in the Midwest.

September 2004-January 2007 ***Environmental Specialist (II),*** Everglades Mitigation Bank, Corporate Real Estate, Florida Power and Light Company (FPL), Juno Beach, FL

- Managed restoration of mitigation banks and conducted functional wetland assessments for the sale of mitigation credits for obtaining USACE 404 and Environmental Resource Permits while brokering credit sales with permit applicants.

July 2002-September 2004 ***Environmental Scientist,*** Everglades Division, Southern Restoration Department, South Florida Water Management District (SFWMD), West Palm Beach, FL

- Managed the construction of the Loxahatchee Impoundment Landscape Assessment (LILA) research facility developed to evaluate the success of the Comprehensive Everglades Restoration Plan (CERP).

Nov. 2000-July 2002 ***Senior Scientific Associate***, Site Management, Ecological Technologies Division, Northern Restoration Department, South Florida Water Management District, West Palm Beach, FL

- Assisted in the daily operation of Stormwater Treatment Facilities (>4000 acres) developed to treat agricultural runoff.

June 2000-November 2000 ***Field Intern***, Florida Power and Light

- Conducted a retrospective analysis of mercury content in Raccoons in the Everglades.

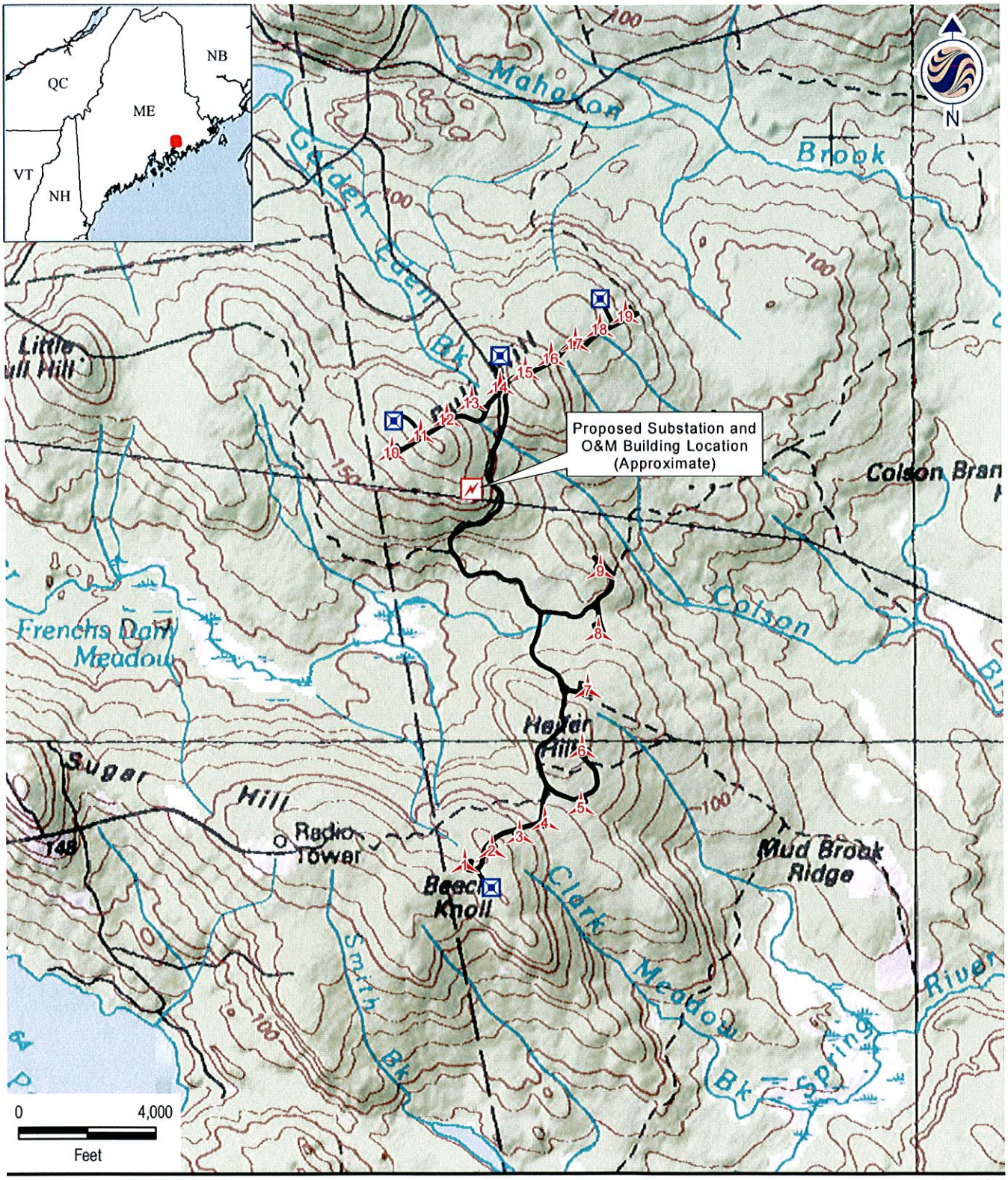
1999-2000 ***Interpretive Guide, Florida Power and Light, Indian Town, FL***

- Guided interpretive, ecological tours though the Barley Barber Cypress Swamp as part of a private/public partnership between Florida Power and Light and the Seminole Country Inn.

EDUCATION

B.S. Biology, University of the South, 1999

M.S. Environmental Engineering Sciences, University of Florida, 2008



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Legend

- Turbine Layout
- Permament MET Towers
- Proposed Access Road

Client/Project
Blue Sky East
Bull Hill Wind Project
T16 MD, Maine

Figure No.
1

Title
Project Site Map
December 3, 2010

00500-00-USGS_turbines8.5x11.mxd

Table 1. Key Facts

Key Facts	Units	Comments
Number of Turbines		
Vestas 1.8 MW V-100	19 Turbines	1.8 MW, 476 feet to vertical blade tip
Bull Hill Rated Output		
Vestas 1.8 MW V-100	34.2 MW	Actual generation will vary
Bull Hill Wind Resource		
Prevailing wind direction	Northwest	
Average wind speed	7.2 meters/second	Between a Class II and Class III wind resource
Cleared Acreage---within M-GN zone		
19 Turbine Pads Temporary clearing Permanent clearing	 22.1 acres 5.3 acres	Temporary clearing (pad clearings + grading) = 0.8 to 1.3 acre per pad. Permanent clearing (crane pad + driveway + foundation + 37.5 radius) = 0.28 acre per pad.
New Crane Paths Temporary clearing Permanent clearing	 23.5 acres 17.0 acres	36 foot wide crane roads Temporary: roadway, ditches, grading Permanent: roadway width
New Access Roads Permanent clearing	 1.3 acres	24 foot wide access roads
New Met Tower Access Roads Permanent clearing	2 acres	12 foot wide permanent met tower access roads
Existing Roads, Widening Temporary clearing Permanent clearing	 0.2 acre 0.0 acre	
Stump Dump	<1 acre	
Lay down areas Temporary clearing Permanent clearing	 9.6 acres 0.0 acre	material/equipment laydown areas only
New Temporary Met Towers Temporary clearing	0.0 acres	Temporary mets will be free standing, eliminating the need for guy wires
Permanent Met Towers Temporary clearing Permanent clearing	 0.0 acres 8.4 acres	Assumes clearing for guy wires for three towers
Collector line corridor Permanent clearing	 0.5 acres	
Total Temporary clearing **Total Permanent clearing** **Total Project clearing**	**55.4 acres** **34.5 acres** **89.9 acres**	
Wetlands & Streams Impacted		
Roads	0.0square feet of permanent wetland fill	One wetland will be bridged
Turbine/collector lines	0.0 square feet	
Total Wetland Impact	0.0 square feet	
Total Stream Impact	0.0 square feet	One intermittent stream will be bridged with an open culvert
Road Mileage		
New Crane Path	3.9 miles	
New Access Road	0.9 miles	
Total New Roads	**4.8 miles**	
Total Use of Existing Roads	**2.8 miles**	
Approximate Location Distances from nearest turbine		
From Molasses Pond	1.9 miles	
From nearest non-participating dwelling	3,882 feet	Fire Lane 24, Eastbrook
From nearest scenic resource	2.0 miles	Narraguagas Lake
From Schoodic Mountain	8.3 miles	Donnell Pond Public Land

REPORT OF THE GOVERNOR'S TASK FORCE ON WIND POWER DEVELOPMENT:

Finding Common Ground For a Common Purpose

(Photo from Walter Gooley, Wind Power Task Force Flight, November 28, 2007)

FINAL REPORT
February 2008

This report was unanimously approved by the members of the Governor's Task Force on Wind Power Development with the following understanding:

Consistent with "Mutual Understandings" among Task Force members agreed to early in the project, I concur with the content of the Report of Governor's Task Force on Wind Power Development.

Further, I understand that for this effort to be successful, it is important that the Task Force members stand united in encouraging respect for the conclusions the Task Force has reached, and the implementation of these recommendations as a coherent whole.

R. Alec Giffen (Chair), Director, Maine Forest Service
Senator Phillip Bartlett
Juliet Browne, Verrill Dana LLP
Pete Didisheim, Director of Advocacy, Natural Resources Council of Maine
Judith A. Dorsey, Retired Lawyer
Representative Stacey Fitts
Senator Walter Gooley
Jody Jones, Wildlife Ecologist, Maine Audubon Society
John Kerry, Director, Governor's Office of Energy Independence & Security
Kathleen Leyden, Coastal Program Manager, State Planning Office
David Littell, Commissioner, Dept. of Environmental Protection
Representative W. Bruce MacDonald
Milton McBreairty, Business Manager, IBEW Local Union 567
Patrick McGowan, Commissioner, Dept. of Conservation
Dave Publicover, Appalachian Mountain Club (alternate member)
Steve Timpano, Environmental Coordinator, Dept. of Inland Fisheries & Wildlife
David Wilby, Executive Director, Independent Energy Producers of Maine

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Acknowledgements

Special thanks to Ann Gosline of Gosline & Reitman Dispute Resolution Services for organizing the group process used to develop this report, her assistance in thinking through tough issues and being there whenever advice was needed; to Todd Burrowes for bearing the burden of much of the staff work required for the Task Force to be successful; to John Weber for his assistance on community wind, trends in technology and in offshore wind development; to David Douglass, for assistance on economics issues; to Rondi Doiron for the myriad tasks, large and small, she handled in organizing meetings and field visits and producing the report; to Greg Lord for website design and upkeep, and keeping our meetings on the air at Bolton Hill; to Greg Miller for updating our maps repeatedly; and to all the members of the Task Force for their open-minded and constructive approach to the issues, and unanimous support for this report.

R. Alec Giffen, Chair

Executive Summary

Following months of analysis and study, the Task Force on Wind Power Development in Maine has unanimously approved this report concluding that each of the goals established by Governor Baldacci can be achieved: Maine can become a leader in wind power development, while protecting Maine's quality of place and natural resources, and delivering meaningful benefits to our economy, environment, and Maine people. Achieving all three of these goals simultaneously, however, will require careful planning and balanced decision-making.

Maine has a significant wind resource that can be tapped to provide clean, indigenous renewable power that will not produce greenhouse gas emissions or other air pollution, and that will increase the reliability of the region's electricity supply. After a detailed review of Maine's wind resource, regional and projected markets for clean power, technology trends, and Maine's greenhouse gas emission goals and policy commitments, the Task Force concludes that Maine should seek to host at least 2,000 megawatts (MW) of installed wind power capacity by 2015, and at least 3,000 MW by 2020. The Task Force believes that at least 300 MW of the 2020 goal could be achieved with projects built offshore.

The Task Force recognizes that achieving these goals is not entirely within Maine's control, and will depend on factors such as technology developments, future energy costs, federal policies, and more. It further recognizes that, as the Governor directed, these goals should be accomplished without compromising Maine's special quality of place, and in a fashion that provides tangible benefits for Maine people.

These are ambitious goals for wind power development, but we believe they are realistic, achievable and necessary. As part of a broader energy policy, Maine has an opportunity and responsibility to help reduce our dependence on fossil fuels, increase energy independence, and reduce environmental impacts caused by energy generation. Wind power has an important part to play within such a policy. Wind power is broadly recognized to be the most significant, economically viable, utility-scale renewable source of electricity currently available, which helps explain why it is the fastest growing power source in the world.

The Task Force recognizes that wind power can be an important part of Maine's energy and climate strategies, but the Task Force also believes that Maine and the region must work hard collectively to dramatically increase energy efficiency, encourage development of other cost-effective renewable energy technologies, and reduce greenhouse gas emissions from the full range of sources. Accomplishments are needed with all of these strategies, and progress in any one area will not obviate the need for action elsewhere. To increase our energy security, reduce our reliance on fossil fuels, and help curb the threat of climate change, we need to do it all.

For Maine to become a leader in wind power development, changes must be made in the regulatory process for wind power projects, and a planned approach must be established to help guide wind power projects to appropriate sites.

Maine's regulatory framework for large development projects such as wind power was created 40 years ago, long before utility-scale wind power was considered a possibility. Regulatory

criteria need to be updated and clarified so that applicants, decision-makers, and the public have a clear understanding of how project applications will be judged. In this report, the Task Force recommends a number of specific changes to streamline the process for wind power permitting and to make the process more predictable and coherent for all interested parties.

Maine is a large state with significant wind resources in many different locations, from the interior mountains to the coast, and from Aroostook County potato fields to Down East islands and offshore. Current and projected improvements in wind power technology, and changes in the electrical power market which favor clean power sources, are having the result of increasing the number of places in Maine where utility-scale wind power projects may be economically viable. This is an encouraging development that could substantially reduce conflicts over the siting of wind power projects.

Because utility-scale wind power turbines are very large, they can be visible from a considerable distance. Maine has many treasured and unique scenic and natural resources which could be degraded through a haphazard approach to wind power development. For that reason, the Task Force strongly supports implementation of a planned approach for wind power development which would reward well-sited projects with expedited review.

The Task Force recommends that the Legislature establish Expedited Review Areas in Maine which would include all organized towns and a portion of the Land Use Regulation Commission's (LURC) jurisdiction. The Task Force has developed a map that delineates the boundaries of the areas it recommends for expedited processes. For unorganized territories within these areas, a rezoning application would not be required since wind power would be designated as an allowed use, with a development permit. In Maine's organized towns, wind power permitting would be streamlined and projects would be judged by a visual impact standard appropriately customized to wind power development. In designating areas for expedited review, Maine would be sending a clear signal to wind power developers about the areas within the state that appear to be most appropriate for wind power development.

The Task Force also evaluated opportunities for encouraging wind power development at the community level, and we have included a number of recommendations to help spur community and small-scale wind power.

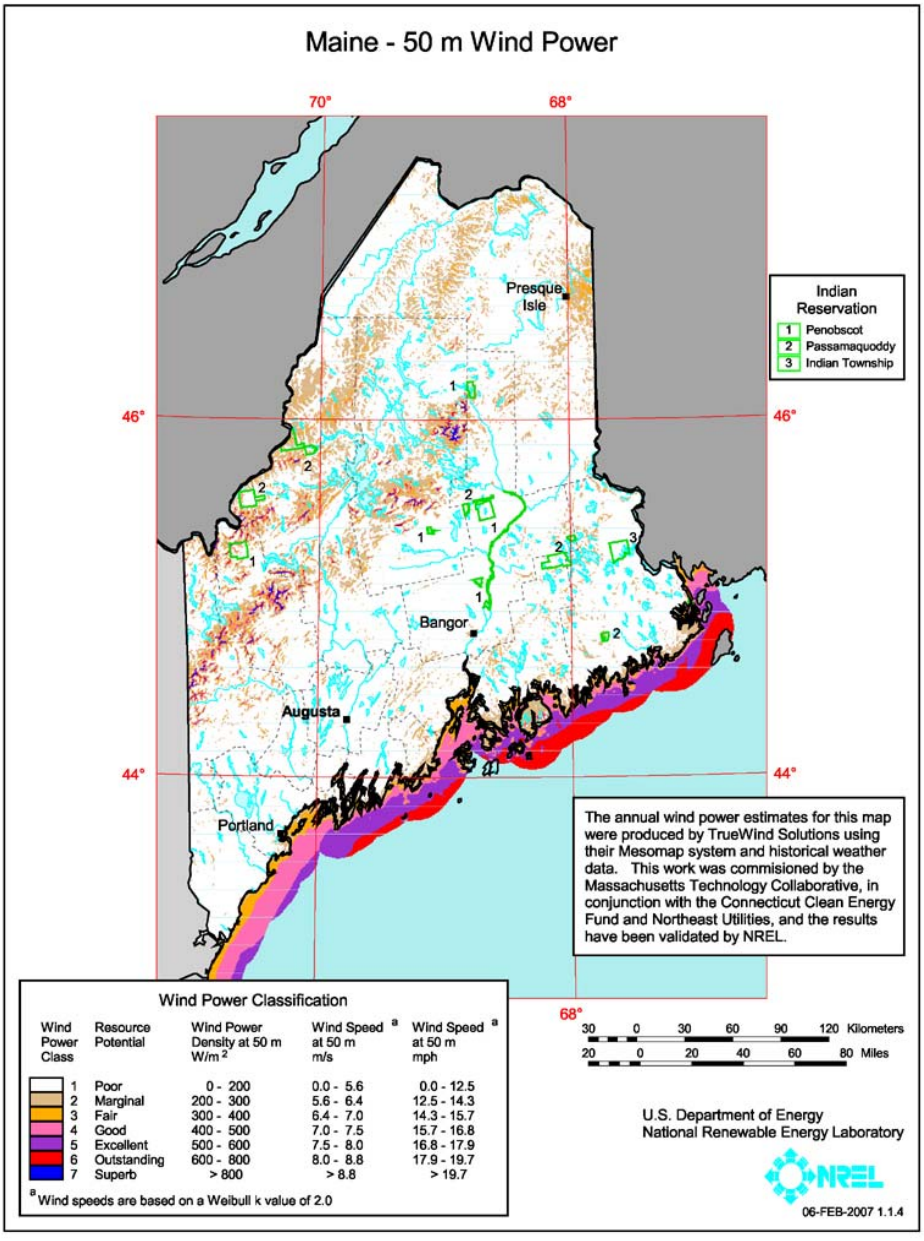
The Task Force hopes that the approach provided in this report can help instill a sense of common purpose among people throughout Maine – bringing together those who care deeply about the development of clean and reliable power, those committed to protecting the natural character and resources of Maine's landscape, and those who see wind power as an important opportunity for creating economic benefits from an indigenous energy source.

It is unlikely that all conflict surrounding the siting of wind power projects can be eliminated, but tensions can be substantially reduced through careful site selection by developers, and thoughtful involvement of Maine people in the permitting process.

The Task Force sees the path forward for wind power development in Maine within a larger context of common purpose with the rest of the New England states who, with Maine, are part of a regional effort to reduce our greenhouse gas emissions to 10 percent below 1990 levels by 2020. Each state has unique opportunities to achieve reductions, but all must share a common commitment toward meaningful climate protection. While Maine has a substantial amount of the

regional wind resource, and thus the potential to develop a great deal of wind power, we expect other New England states to do their part in developing renewable energy, boosting energy efficiency, and reducing greenhouse gas emissions from all sectors.

Figure 1
Maine Wind Resource Map



Source: U.S. Department of Energy, National Renewable Energy Laboratory (2007). Also provided as Attachment D.

Background and Process

Background. Wind power is the fastest growing utility-scale source of renewable energy in the world. Growth and expansion of the wind power industry holds great promise for Maine, which has the greatest wind energy potential of any New England state and ranks 19th in the United States as a whole.

Wind power has significant potential to benefit Maine and our region, and address major state and regional energy-related changes. Wind power's economic and environmental benefits include reduced dependence on imported fossil fuels (see Attachment L for an overview of the greenhouse gas emission benefits that can result from the development of wind power); improved energy security through use of an indigenous, renewable resource; and generation of electricity without the greenhouse gas emissions that result from use of fossil fuels, regardless of where they originate. Moreover, wind power development can provide short and long-term economic and employment benefits for Maine citizens both directly and indirectly, through stimulation of growth and development in related businesses and industries.

Two of the major, energy-related challenges that Maine is facing are the need to reduce greenhouse gas emissions and the need to increase the reliability of our electricity supply. Wind power holds great promise in helping meet each of these challenges.

The existence and magnitude of the threats posed by climate change are generally acknowledged. In the United States, the Northeast region has taken the lead in addressing emissions from the electricity sector by developing the Regional Greenhouse Gas Initiative (RGGI). RGGI is a ten-state CO_2 cap-and-trade program covering CO_2 emissions from electrical generating units, under which the Northeast region must limit CO_2 emissions in 2009 and place a cap on them by 2014. The cap will be reduced by 10 percent by 2018.

Maine is also participating in a greenhouse gas emissions reduction effort as a member of the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP). The NEG/ECP group adopted a Climate Action Plan in 2001 which established greenhouse gas reduction goals across all sectors, and included a goal of reducing total greenhouse gas emissions to 10 percent below 1990 levels by the year 2020. The NEG/ECP goals were enacted into Maine law in 2004 (38 MRSA §576).

These goals are very aggressive, and cannot be met without unprecedented efforts on the part of all Maine citizens. Wind power must play a major role in those efforts because of its potential for greenhouse gas emission reduction as outlined in Attachment L.

Tackling the challenge of increasing the reliability of our electricity supply will be no less difficult. New England, in general, and Maine in particular, are heavily dependent on natural gas for generation of electricity. According to ISO New England (ISO-NE), in 2006 natural gas represented almost 40 percent of New England's total installed electric generation capacity, which is nearly 12,000 MW. Maine's reliance on natural gas is even greater.

While much attention is paid by the public to the retail price of electricity, there appears to be little public understanding of the very important and very real issue of energy reliability. Threats to the reliability of our electricity supply are no longer limited to those times of the year when

brownouts are most expected – hot, muggy summer days. Maine's most recent experiences have occurred during winter months; for example on December 2, 2007, when an all-day power watch was declared by ISO-NE due to a natural gas-related "capacity deficiency."

Demand for electricity continues to grow in Maine and in New England as a whole. The demand for natural gas in other sectors of the economy has been increasing steadily as well. According to *Annual Energy Outlook 2004*, issued by the Energy Information Administration of the U.S. Department of Energy, total natural gas consumption in New England from all sectors is expected to grow 31.6 percent between 2004 and 2024. That figure is conservative compared to projections by the natural gas distribution industry itself. It is imperative that Maine begin to help address this problem by, among other things, decreasing its reliance on natural gas for generating electricity. Wind power holds great promise in this regard.

At the same time, wind energy development proposals have environmental impacts and have generated generalized and site-specific concerns regarding effects on natural resources, related public uses, and communities. As with other development, proper siting can avoid or minimize adverse impacts.

A proactive approach to addressing issues and opportunities presented by wind power development will help in attracting investment in wind energy; facilitating siting of facilities in a manner that appropriately safeguards the state's natural resources, communities, unique character and attributes; increasing the reliability of Maine's electricity supply; and realizing tangible economic and environmental benefits for Maine people from the wind power development that takes place within Maine.

Governor Baldacci's May 2007 Executive Order (see Attachment A) creating the Task Force envisions such an approach and, accordingly, has the following three underlying objectives:

- To make Maine a leader in wind power development;
- To protect Maine's quality of place and natural resources; and
- To maximize the tangible benefits Maine people receive from wind power development.

This report, which focuses on how to facilitate siting of wind power development in ways that optimize its benefits to our state, provides the Task Force's recommendations to the Governor on key steps to meet these policy objectives and so secure the numerous environmental and economic benefits of this indigenous renewable energy resource, while minimizing its adverse impacts.

Task Force membership. The Task Force's members (see Attachment B), among whom are several legislators, were selected to ensure the benefit of different perspectives and expertise in its deliberations and thus, provide opportunity for development of the strong and effective solutions that may result from forging consensus among diverse viewpoints.

Chair; Staffing. The Governor selected Maine Forest Service Director Alec Giffen to chair and oversee the work of the Task Force, with primary staff support from the Maine State Planning Office (SPO) and consultant Ann Gosline. Ann, as well as Todd Burrowes and John Weber of SPO, were critical to the development of this report and the Task Force is indebted to them for their extraordinary efforts. Staff of the Departments of Environmental Protection (DEP), Conservation (DOC), Inland Fisheries and Wildlife (IF&W), Marine Resources (DMR), and

Economic and Community Development (DECD), as well as LURC and Public Utilities Commission (PUC), also provided advice and information to inform and guide the Task Force's deliberations. Rondi Doiron of the Maine Forest Service provided critical secretarial and organizational services.

Website. In order to provide the public with ready access to information considered by the Task Force and to provide comments, DOC established and maintained a website (www.maine.gov/windpower) housing detailed information regarding the meetings and issues under its purview.

Task Force meetings. Beginning its work in July 2007, the Task Force met 12 times to consider information and develop options focused on advancement of the three policy objectives noted above. In addition, DOC afforded Task Force members opportunities to view in the field both functioning wind turbines and areas for which turbines are proposed. Members of the public, including representatives of the wind power industry and concerned citizens, had opportunities at each Task Force meeting to provide comments on matters under discussion, and made important contributions to the Task Force's work through their active participation in its meetings and with the subcommittees (see Attachment C for a list of people who participated in various ways). The Task Force expresses its particular appreciation to residents of the town of Mars Hill who on several occasions traveled to the meetings in Augusta to share their experiences and concerns. Agendas and summaries of each of the Task Force's meetings, as well as public comments on this effort, are posted on the above-noted project website.

Overview of approach and topics considered. The Task Force's iterative study process focused on development and consideration of options to address key issues regarding the following: environmental and land use laws regarding siting of grid-scale wind power development facilities; encouragement of development of community-scale wind power (principally through the work of a subcommittee of the Task Force); and economic and related energy policies to encourage siting of wind power in ways that benefit Maine people. The following is a brief summary of the Task Force's inquiry in each of these areas.

- Environmental and land use issues. A primary focus of the Task Force's work involved consideration of options to address issues and concerns to remove potential barriers in Maine's environmental review process to efficient and effective decisions regarding siting of grid-scale wind power projects. The PUC's 2005 study of the wind industry's potential in Maine recommended such consideration. The discussion on this issue was informed by testimony presented by wind industry representatives, conservation groups and members of the public (some with concerns about adverse consequences of siting wind power projects, others with concerns about failing to do so). Based on this input, the Task Force considered a number of straw proposals for improvement of Maine's regulatory framework. As can be seen from the materials on the website, these straw proposals covered the full range of possibilities that Task Force members could identify. Staff at DEP and LURC assisted the Task Force in explaining and responding to questions regarding pertinent laws and regulations which those agencies administer.

  The recommendations in Section II of the report are the product of the Task Force's deliberations on these issues.

Given comparative lack of industry interest in pursuing development of offshore and nearshore wind resources in the near term, due at least in part to cost considerations and current technological limitations, the Task Force focused its discussion on issues regarding development of onshore areas. Estimates of the state's wind power potential do suggest there is very significant potential for development of wind power in ocean areas, particularly deeper waters beyond Maine's three-mile limit (See Figure 3 and Attachment D), and the Task Force recommends that Maine aggressively pursue capitalizing on that potential.

Section VI provides the Task Force's recommendations regarding nearshore and offshore wind energy development.

– Community-scale and smaller-scale wind power development. Notwithstanding its principal focus on grid- scale projects, the Task Force recognizes the benefits and importance of community and smaller-scale wind projects, which include their potential to address local energy supply and cost concerns and to foster public awareness of wind energy's benefits and acceptance of its related environmental and land use effects. In fact, the Task Force understands that in some countries with a good deal of wind power, most of it is community-owned. To address issues associated with smaller-scale wind power generation, such as community-sized or residential-sized projects, the Task Force appointed a subcommittee on community wind. The subcommittee was charged with exploring barriers and issues associated with the development of such projects in Maine. The subcommittee was chaired by Representative Bruce MacDonald and Representative Stacey Fitts, and held three well-attended morning workshops in the fall of 2007. At these workshops, information regarding existing and proposed facilities, the industry, and regulatory information from the PUC was presented and discussed through a series of speakers. The subcommittee prepared a series of recommendations supported by background information, all of which was presented to and accepted by the full Task Force. See Section III.

– Economic and Energy Policy Issues. To ensure a firm factual foundation and shared understanding of key issues, the Task Force considered presentations and information regarding Maine's wind energy potential (the nature, location and current and emerging technologies available to tap this indigenous renewable resource), the economics of the wind industry, and related electric power transmission issues.

PUC Chairman Kurt Adams and agency counsel Mitch Tannenbaum, and DEP Commissioner and Task Force member David Littell were particularly helpful to the Task Force in developing and presenting information regarding the regional energy system, electric transmission, the Regional Greenhouse Gas Initiative, and other renewable energy policy issues as they relate to wind power.

The Task Force also discussed approaches for setting state goals regarding wind power development in light of energy, economic development, and environmental policies. Task Force member Pete Didisheim made available to the Task Force analyses of how much wind power will be needed to satisfy New England states' renewable energy generation requirements, the New England Governors/Eastern Canadian Premiers' climate action plan goals, regional greenhouse gas reduction goals, and potential

locations in Maine where wind development appears to be economically viable (study prepared by Robert Grace, Sustainable Energy Advantage, LaCapra Associates, and AWS TrueWind). Information from this study, funded by the Natural Resources Council of Maine, the Conservation Law Foundation, the Union of Concerned Scientists, Environmental Defense, and the Kendall Foundation, was valuable to the Task Force in considering the potential role of wind power generation in Maine and how wind power fits within a larger context of renewable energy development and energy utilization across New England (see Attachment E).

The Task Force's resulting recommendations regarding assurance that wind power development benefits Maine people and communities and provision of economic development incentives are provided in Sections III and IV.

The Task Force's recommendations regarding state wind energy goals are provided below in Section I.

I. Goals for Wind Power Development in Maine

The Task Force was asked to propose specific goals for installed wind power development in Maine for the years 2010 and 2020, and to provide an estimate of the economic and emission-reduction benefits of achieving such goals. The Task Force concluded that the year 2010 was too near to be affected significantly by recommendations in this report, so we focused instead on the development of goals for 2015 and 2020.

The Task Force considered the issue of wind power goals for Maine within the larger context of New England's electrical generation system and Maine's energy and greenhouse gas reduction policies. We specifically considered information in the following areas: projections of electricity use through the year 2020, the role that energy efficiency could play in reducing growth in electricity demand, technology trends and economic viability for wind power and other renewable energy sources, the estimated amount and geographic locations of the wind resource in each of the New England states, and existing policies aimed at promoting clean energy development and reducing greenhouse gas emissions.

In 2001, Maine joined with each of the New England states and Eastern Canadian provinces in a Climate Action Plan designed to reduce greenhouse gas emissions to 10 percent below 1990 levels by 2020. This goal was enacted in Maine law in 2003[1], and in Maine's Climate Action Plan of 2004. It is clear to the Task Force that the development of a significant amount of new, renewable energy will be necessary to help meet Maine's greenhouse gas reduction commitments. A detailed modeling analysis prepared by a consultant team led by Bob Grace of Sustainable Energy Advantage confirmed this assessment. Specifically, the Grace analysis concluded that approximately 11,000 MW of wind power would be needed in New England in order to meet our 2020 greenhouse gas reduction goal, even assuming a major increase in energy efficiency across the region, substantial development of other renewable energy sources

[1] An Act to Provide Leadership in Addressing the Threat of Climate Change PL 2003 c. 237 (enacting 38 MRSA c. 3-A).

(including solar and tidal), and significant contributions in greenhouse gas reductions from transportation and other sources. A higher amount of wind power would be needed if the states were to falter in these other areas.

Because of its size and geography, Maine has as much wind resource potential onshore as the rest of New England combined. The potential for offshore wind power development is also very large, yet the costs of offshore wind power remain high, particularly so in the near-term for deep tidal zones along Maine's coast. The viability of such projects in shallower waters to our south, closer to areas with large demands for electricity, may be more promising.

With these factors in mind, the Task Force has concluded that **Maine should seek to host at least 2,000 MW of installed wind power capacity by 2015, and at least 3,000 MW by 2020. The Task Force believes that at least 300 MW of the 2020 goal could be achieved with projects built offshore**. The Task Force recognizes that achieving these goals is not entirely within Maine's control, and will depend on factors such as technology developments, future energy costs, federal policies, and more. Further, as the Governor charged the Task Force, these goals should be accomplished without compromising Maine's special quality of place, and in a fashion that provides tangible benefits for Maine people.

We believe that a significant proportion of the wind power projects needed to meet these goals can be located in areas at lower elevation (below 3,000 ft), and with lower wind speeds, than were considered the cutoff for economically viable projects even a few years ago. We base this conclusion on the fact that wind developers currently are pursuing projects in Aroostook County potato fields, Washington County blueberry barrens, and relatively low-lying hills elsewhere in the state.

This level of wind power development could have significant economic benefits for Maine. Construction of 3,000 MW of wind power would involve billions of dollars in capital investment, and would generate more than $25 million in annual property tax payments. Lease payments also could be substantial and important to Maine people. If projects are built in Aroostook County potato fields, for example, the lease payments to farmland owners could represent a very significant source of revenue – as has been demonstrated in other states.

Most of the employment associated with wind power projects occurs during construction. Building 2,000 MW to 3,000 MW of wind projects in Maine would involve dozens of Maine companies and employ several hundred workers, many with specialized skills, over an extended period. Each megawatt of installed capacity is likely to generate over $125,000 in construction wages (yielding some $250 to $450 million overall). These projects would generate high-quality maintenance jobs, and could stimulate jobs associated with the manufacture of turbine components. Some turbine component manufacturing jobs already exist in Maine.

Wind power development can contribute to Maine's energy security and energy independence by reducing dependence on foreign sources of energy. The environmental benefits of wind power development in Maine would occur within a larger context of the region's efforts to reduce greenhouse gas emissions 10 percent below 1990 levels by 2020. The Task Force believes that Maine must be prepared to do its part in meeting this goal, but we also expect the other New England states to carry their fair share of the load.

There may be a limit to how much wind power development the people of Maine will accept over time as part of their contribution toward the broader common purpose of addressing climate change, especially if other states are not also making similar commitments. If Maine is called upon to achieve more than its responsibilities for meeting the region's energy and greenhouse gas reduction goals (including through wind power, other renewables, energy conservation, etc.), then the region should contribute to meeting Maine's related needs (e.g., reduced electrical rates, transmission costs, and resource conservation needs).

Recommendation

❖ **Track progress toward achievement of state wind energy goals**

In order to ensure ongoing progress, the Task Force recommends that the Office of Energy Independence and Security (OEIS) track progress toward meeting the above-stated goals on an annual basis. The Task Force furthers recommends that a comprehensive assessment be conducted in five years. Specifically, the Task Force recommends that the Governor's Office by December 2013, utilizing state agencies as appropriate, conduct a full review of the status of meeting the 2015 wind power goals, and the likelihood of achieving the 2020 goals. This assessment should examine experiences from the permitting process, success in implementing the recommendations of this report, projections of wind developer plans, technology trends, and the status of Maine and each of the other New England states in making progress toward reducing greenhouse gas emissions. The assessment should provide recommendations to the Legislature, including any revisions that may seem appropriate regarding Maine's wind power development goals, permitting processes, identification of expedited permitting areas in LURC territory (see related recommendation in Section II), or policies that may seem necessary and appropriate, specifically including, but not limited to, consideration of whether or not creation of an independent siting authority is advisable.

The Task Force suggests that OEIS coordinate this effort with related recommended efforts to monitor pertinent technological developments and address their state policy implications. See Section VII, below.

Lead agency: OEIS; ongoing

II. Permitting Grid-Scale Wind Power Projects

The principal issue focused on by the Wind Power Task Force has been determining how Maine's process for licensing wind power projects could be made more rational and streamlined. This focus is related to the first of the Governor's objectives in creating the Task Force – that is, making Maine a leader in wind power development. Grid-scale wind power projects are considered by the Task Force to be projects which are large enough to trigger the Site Location of Development Act. In general terms, the Site Law trigger for wind power projects is the creation of at least three acres of what are termed "impervious surfaces," which consist of rooftops, roads, parking areas, turbine sites, and other similar areas not revegetated after being stripped of vegetation, or development of an area 20 acres or more in size. As used in this report,

the term "grid-scale wind power project" includes, in addition to generating facilities (turbines), transmission lines, together with all associated equipment and facilities, that are constructed solely for the purpose of electrically and physically interconnecting the generating facilities to the transmission system (i.e., the power grid).

To put this issue of wind power siting in its historical context, Maine's regulatory system was initially developed almost 40 years ago, long before grid-scale wind power projects were a consideration. Therefore, it should come as no surprise that the regulatory system was not set up with modern wind power projects in mind.

The Problems Identified

The Wind Power Task Force has identified the following problems with Maine's process for licensing or permitting wind power projects:

- **Confusion over the benefits of wind power development**. Wind power displaces electricity generated from fossil fuels and reduces emissions of atmospheric greenhouse gases and a variety of other pollutants (SOx, NOx, mercury, etc.). However, because back-up plants, many of which burn fossil fuels, are needed for when wind velocities are low, there has been some confusion among both the public and decision-makers over whether and the degree to which these benefits really exist. This confusion needs to be clarified dispositively so that the regulatory process can focus on real environmental issues.

- **Maine's current regulatory approach does not recognize the benefits of wind power.** As stated above, Wind power projects provide positive environmental benefits by displacing fossil fuels and avoiding emissions of atmospheric greenhouse gases and a variety of other pollutants (SOx, NOx, mercury, etc.). However, Maine's regulatory processes for evaluating and reaching decisions on permits for development projects have not been designed to consider such benefits. Although an explicit "balancing" of project benefits with project impacts is not proposed, the benefits of wind power should be taken into account in designing an appropriate regulatory process as proposed herein.

- **The requirement that projects fit harmoniously with the natural environment**. The Site Location of Development Act, which provides for the principal but not the exclusive state land use approval typically needed to site a wind energy project in the organized portions of Maine, includes a requirement that the project be found to fit harmoniously with the natural environment from scenic, as well as other, perspectives. (*See* 38 MRSA § 484, sub-§3. LURC's standards for review of proposed development, including wind energy projects, and LURC's rules regarding rezoning to a planned development subdistrict, contain a comparable requirement.) (*See* 12 MRSA § 685-B, sub-§4; LURC rules chapter 10.24[3]). However, grid-scale wind power projects are, in many cases, highly visible features of the landscapes where they occur as they consist of multiple turbines, often on or near a ridge line, and transmission lines to hook the power produced into Maine's electrical grid. As a result, in the view of the Task Force, this test, as it concerns potential effects on scenic resources, is inappropriate for grid-scale wind power projects. Clarification of how this standard applies to evaluation of the potential effects of wind power projects on scenic resources, or replacement of this standard with an alternative wind power-specific standard, is therefore advisable.

- **LURC's rezoning criteria**. For LURC's High Mountain Area Protection Districts (established for all areas above 2,700 feet), the Commission requires proof that the rezoning to a planned development subdistrict would provide "substantially equivalent protection" compared to that provided by the existing High Mountain Area Protection District (P-MA subdistrict). High Mountain Area Protection Subdistricts were designed to protect fragile mountain environments. While logging, ski area facilities (which by necessity must occur in mountain areas), roads and utility facilities are allowed in the P-MA zone subject to permitting, wind power development is not allowed in the P-MA subdistrict, or any other LURC protection subdistrict. A requirement that an applicant seeking rezoning for a planned development subdistrict demonstrate that a string of turbines, roads and transmission lines provides a substantially equivalent level of environmental protection to that provided under a P-MA zone is, in the judgment of the Task Force, inappropriate. Further, while LURC's findings and rulings in these regards are due deference, they have not been tested in the courts, and future Commissions could interpret these standards differently than the current Commission. Lastly, LURC's rezoning criteria also include a requirement that the developers show that they have chosen the "best available site." This requirement applies in both High Mountain Protection Area Districts and in other districts as well. Again, while LURC is due deference, there may be broad differences in interpretation of this standard. Clarification of this standard as it relates to wind power is therefore advisable.

- **Rezoning currently occurs entirely in reaction to development plans.** At the present time, rezoning for wind power development occurs only in response to applications from developers. The 1997 Comprehensive Land Use Plan called for creation of a statewide plan for wind power development, but such a plan has not been done. More recently, state agencies attempted to create siting guidelines for wind power projects, but the resulting document is very general and not likely to result in significant guidance to developers (Maine Department of Environmental Protection 2005). A more comprehensive approach is needed that helps guide wind power development proposals, based on general compatibility with existing land uses.

- **Limited energy expertise among the members of LURC and BEP**. Members of LURC and BEP have traditionally been chosen based upon their expertise regarding environmental and natural resources, as opposed to energy-related, issues. Decisions on wind power projects are highly complex and informed decisions require considerable knowledge of energy systems, energy markets, transmission line systems, and the relationship of wind power projects to them. Regulatory experience reviewing wind power projects has demonstrated the importance of having such expertise represented on decision-making bodies.

- **Lack of resources for permit processing and delays in permit processing**. The state agencies which process the relevant permits, LURC and BEP, can require substantial review periods, particularly when one of these volunteer, citizen boards has several pending projects which are highly complex. This has been a particular issue with LURC, which is currently dealing with Plum Creek's proposal for a large-scale Lake Concept Plan, as well as several wind power projects. Given the nature of volunteer citizen boards, adjudicatory procedures, and the uneven nature of the flow of major projects, it is difficult for boards to meet all of their obligations in a timely manner. For example, adjudicatory hearings typically require

three to five days and these proceedings are in addition to board or commission meetings on other topics. Further, the demands placed on these boards increasingly require specialized expertise. Providing these resources, as well as the staffing required for presentations and the preparation of board orders, is particularly challenging given the State of Maine's current budgetary situation. As a result, complex projects, not necessarily just wind power projects, can face delays largely due to a backlog of projects or the complex, unfamiliar issues they raise. Such delays are costly to the applicants and discourage wind power development in Maine.

- **Differences in processes between the agencies.** While very similar in the issues that they address in reaching siting decisions, agency processes differ in some regards, both because their mandates differ and because they have evolved independently. As a result, similar projects potentially can be subject to different state-level review standards and timeframes depending on whether they are located in the unorganized territories or not. Further, some projects occur in the jurisdictions of both DEP and LURC, and these differences in processes can be particularly confusing or frustrating to wind developers and counterproductive in achieving timely consideration of these projects. When considering this issue, it is important to recognize that there is a fundamental difference in the mandates of DEP and LURC which results in confusion in understanding the regulatory requirements of these agencies. DEP is an environmental permitting agency ("siting"), while LURC must also determine the appropriateness of locating major projects in specific areas ("zoning") before it even gets to the siting criteria.

- **Lack of clarity on some regulatory issues.** In the case of a few issues, wind power projects have specific characteristics which are different than those of other types of development projects. For example, in the case of wind power projects, it is particularly important to understand impacts on birds and bats and how noise from a variety of components of wind power projects can affect people living and working in the vicinity. Further, as explained above, because their requirements have evolved largely independently, there are some differences between the specific approaches taken to such regulatory issues by LURC and DEP. DEP has very specific rules and standards that have developed over almost 40 years for the types of development it has regulated under the Site Location of Development Act and Natural Resources Protection Act. The standards that govern LURC's rezoning decisions are, by their nature and purpose, not comparably detailed and the Task Force heard testimony that they are inherently less predictable, making it difficult to justify the multi-year investment in investigations and site acquisition to determine whether or not development of any given site is cost-effective enough to submit it for permitting. These regulatory differences and lack of clarity on some issues have led to confusion or frustration among developers, lack of regulatory predictability, and inefficiencies.

Recommendations

Based on this assessment of the problems, the Wind Power Task Force recommends that the following be considered by the Governor as solutions to the problems identified above.

❖ **Clarify the benefits of wind power projects**

The topic of whether or not wind power projects actually result in reductions of atmospheric pollutants has somewhat surprisingly turned out to be a major issue in the public dialogue at recent hearings. Legislation to implement the recommendations of the Wind Power Task Force and statements from state officials should clarify that wind power projects do result in reductions of atmospheric greenhouse gases and other air pollutants (specifically, but not limited to CO_2, NOx, SOx, and mercury – see Appendix L). The Task Force recommends that, with input from DEP and PUC, this issue be put to rest by a dispositive policy statement from the Legislature.

❖ **Identify areas where permitting for wind power development will be streamlined**

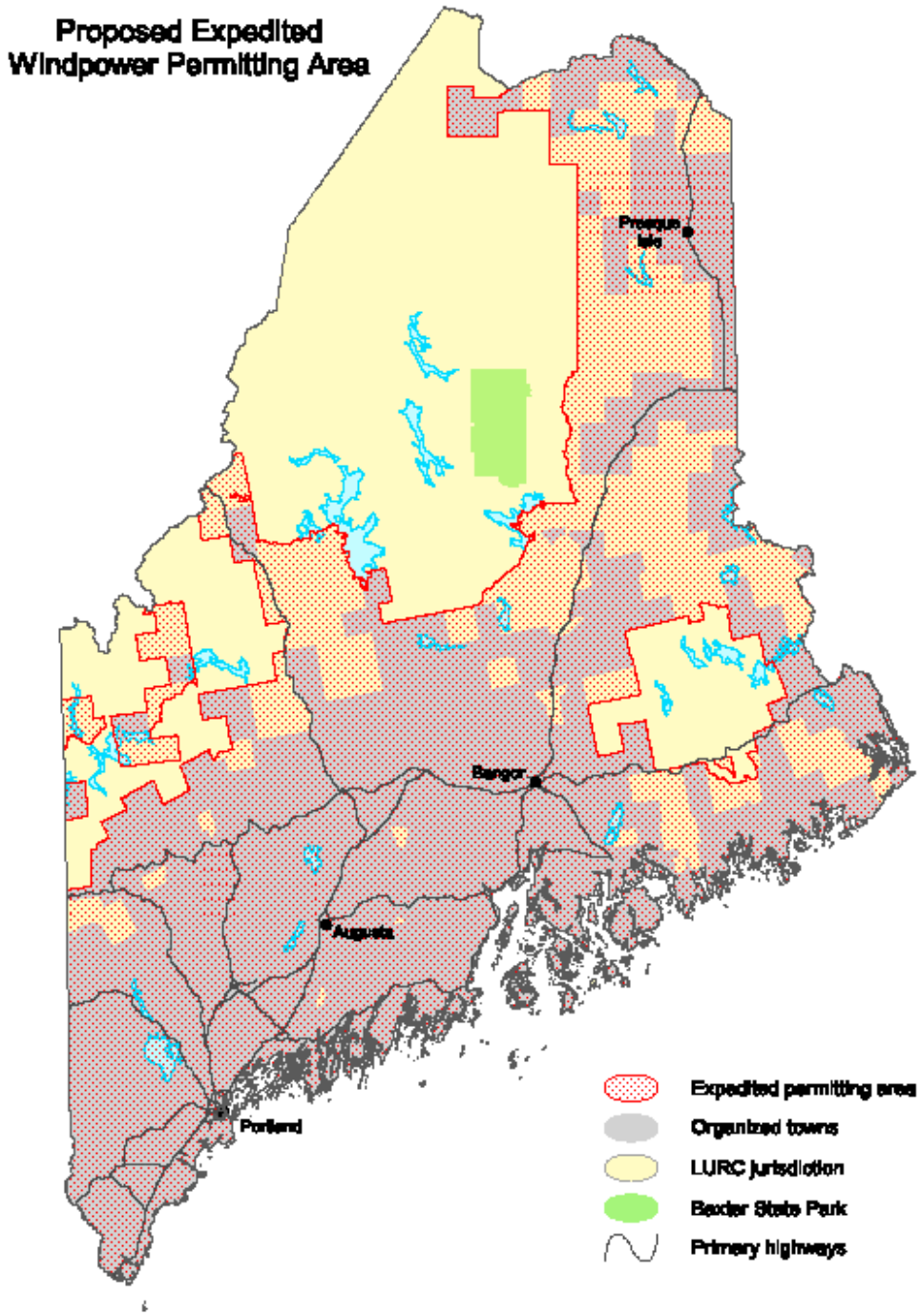
The Task Force believes that potential conflicts over the siting of proposed wind power projects would be substantially reduced if the state designated where wind power projects would qualify for expedited permitting. In the judgment of the Task Force, the area where permitting should be expedited (Fig. 2) is the entirety of Maine's organized towns and portions of the unorganized territories which lie on the fringe of the jurisdiction of LURC where unorganized towns are intermingled with plantations and organized towns.[2]

[2] More specifically, the Task Force recommends that the following types of areas be designated for expedited permitting:

- All organized towns (as regards the area to be included for expedited permitting, the Task Force's intent is to recommend inclusion of all portions of the state's organized area above the mean high water line in the case of waters subject to tidal influences [.e., it does not include state owned submerged lands beyond the intertidal zone]);
- Portions of the unorganized territories that are generally on the fringe of the jurisdiction where unorganized townships are intermingled with plantations and organized towns, but excluding 1) broad areas that encompass concentrations of ecological, recreational and/or scenic values that are among the most significant in the jurisdiction, and 2) smaller areas (primarily, but not necessarily limited to, P-MA zones) that possess ecological, recreational and scenic values of particular significance; and
- Areas within approximately one township (6 miles) of certain public highways and which include potential development sites under active investigation, and which do not qualify for exclusion under the previous bullet.

The Task Force recognizes that certain areas within the expedited area are not available for wind power development. These include conservation lands owned by the U.S. Department of Interior, certain other public conservation lands or portions thereof, and certain lands owned by private entities where such development is not consistent with the management objectives or terms of acquisition of such lands.

Figure 2


Proposed Expedited
Windpower Permitting Area
Presque Isle
Bangor
Augusta
Portland
Expedited permitting area
Organized towns
LURC jurisdiction
Baxter State Park
Primary highways

The Task Force recommends that the map depicting the expedited permitting area and a legal definition of where it exists within Maine be made part of the legislation to implement these recommendations. This approach has a number of advantages: principal among them is eliminating uncertainty and resolving this issue definitively now. The legislation should also articulate the process outlined below by which LURC could add areas designated for expedited permitting. In this regard, the Task Force recommends that when petitioned to do so, LURC consider adding areas to the portions of LURC jurisdictions designated for expedited permitting. Such areas would be limited to logical geographic extensions of the areas already identified for expedited permitting, and which are deemed important to meeting the state's goals for wind power development, and further, where their inclusion would not compromise the principal values of the LURC's jurisdiction and the goals of the Commission's Comprehensive Land Use Plan.

In recommending establishment of the expedited permitting area, the Task Force intends that site-specific issues regarding projects proposed, including but not limited to potential impacts on significant wildlife habitat, or other protected natural resources or existing uses, would continue to be addressed through the applicable DEP or LURC permitting process. Likewise, the Task Force recognizes that wind energy development would not be appropriate in certain areas, including but not limited to conservation lands owned by the U.S. Department of Interior, certain other public conservation lands or portions thereof, and certain lands owned by private entities where such development is not consistent with the management objectives or terms of acquisition of such lands.

Areas not included in the expedited permitting area would be subject to the existing regulatory structure and standards, and nothing in this report is intended to change, either expressly or by implication, the criteria by which such projects would be evaluated. Similarly, nothing in this report is intended to change, either expressly or by implication, the criteria by which projects currently under review by LURC or DEP are evaluated.[3]

❖ **Streamline permitting**

Throughout the expedited permitting area, (see above), limit consideration of a grid-scale wind power project's effect on scenic character to consideration of the wind turbines' scenic impacts on public resources of statewide or national significance, and establish an approach to scenic reviews appropriate for wind power projects. Essentially, this involves establishing an approach to scenic reviews of wind power projects more suited to permitting of wind turbines than existing standards designed for other types of projects (see Attachment M). As applied to wind turbines, a scenic analysis would be triggered by impact on a defined scenic resource found to be of statewide or national significance. See Attachment G for the definition of these scenic resources.[4]

[3] The Task Force recognizes that a permit application for a wind power project, like any other development project, will be governed by applicable laws and rules in effect on the date on which the permit application is accepted.

[4] The scenic impact of supporting infrastructure such as buildings, roads, parking lots, and power lines will be evaluated under existing Site Law scenic criteria, as may be modified consistent with the Task Force's desire to streamline the permitting of wind power projects located in the expedited permitting area, and will not be contingent on visibility from resources of state or national significance.

❖ **Within the area where permitting will be expedited in the unorganized territories, eliminate LURC's rezoning process with respect to grid-scale wind power project applications**

As outlined above, wind power development was not specifically contemplated when the LURC rezoning process was initially developed. Rezoning a parcel in effect authorizes a use that, while not authorized under the existing district, is deemed appropriate for the proposed area. If, as is proposed herein, it is determined by legislative action that wind power development is appropriate in the area identified for expedited permitting, the rezoning process is no longer needed. Under current law, if a proposed wind power project is located partly in the organized area and partly in the unorganized territories of the state, and if, as proposed herein, the project is an allowed use within the proposed district(s) of the unorganized territories, then DEP may review the project as a whole and no permit from LURC is required. The Task Force notes that transmission lines for wind power projects in the unorganized territories of Maine will in many cases extend into organized areas to connect with the grid. Consequently, in such cases, if a grid-scale wind power project is established by the Legislature as an allowed use in the expedited permitting area and the project's generator lead were proposed to be a part of the project, DEP would have authority to assume permitting jurisdiction even if the project's turbines were located in the unorganized territories.

❖ **Expedite permit processing at DEP**

This recommendation contemplates refining the way in which permits for wind power projects are handled by the DEP. This would include:

– Making the Commissioner of DEP responsible for issuing all original permits for wind power projects. This would involve an expedited process and timeframes for permit decisions. (Note: Meeting these requirements for expedited consideration will, in some cases, require retaining expertise from outside state government). The costs of outside review necessary to meet these timeframes will require a special agency fee, which at least some wind developers have indicated they are willing to pay[5].

– Having the BEP function as an appeals board for decisions made by the Commissioner as outlined above. BEP hearings on appeals would be based on the record assembled by DEP in considering these cases.

[5] Specifically, the Task Force recommends that the DEP Commissioner make decisions within 185 days. (Note: The 185-day or 270-day timeframe starts after a completed application has been accepted.) So that the application can be processed within these timeframes, applicants are responsible for doing requisite studies for permitting – such as reviewing available data and knowledge bases, delineating wetlands and vernal pools in the project footprint, and one to two seasons of bird/avian studies – before filing an application or negotiating alternative measures (e.g., mitigation) with the agencies. The Task Force recognizes that the transmission line portion of a project may require federal approval by the U.S. Army Corps of Engineers (ACOE) due to wetlands issues, and final resolution of the state review may be contingent on completion of the ACOE' s review. Consequently, the DEP 185-day approval timeline is meant to address only resolution of matters subject to DEP's sole jurisdiction. A hearing, if any, would require a 270-day review (an additional 85 days) and would be held by the Commissioner pursuant to DEP rules. Appeals to the BEP would be based on a record review with a 120-day timeframe for appeal decisions. Court appeals would go directly to the Law Court.

- Having legal appeals from decisions go directly to the Law Court rather than to Superior Court to emphasize the importance of permitting wind projects without long legal appeals.

❖ **Add energy expertise to DEP and LURC**

For wind power projects, the Task Force recommends adding the chair of the PUC or his or her designee as a non-voting member of BEP and LURC. The PUC Chair would not be required to attend hearings, but would be allowed full participation with the BEP and LURC in deliberative sessions with non-voting status so as to avoid the potential for a deadlock created by changing the number of voting members. The addition of the PUC Chair as a non-voting member will not affect the PUC's current ability to place information into the record of agency proceedings.

❖ **Supplement staff resources and expertise available for permit processing**

Encourage LURC and DEP to charge permit processing fees that enable them to hire outside expertise they need to facilitate the processing of permits in a complete and timely manner (not the entire cost of review). LURC and DEP already have this authority, although DEP's authority requires amendment, and there is some evidence to suggest that agencies have been reluctant to use it for fear of criticism of excessive fees. The Task Force recommends that the Governor encourage the Commission, the Board and the Department to utilize this mechanism to get the resources they need to reach complete and timely decisions.

❖ **Adopt and adhere to timelines for permit review**

DEP already has timelines for permit review (185 days)[6] and is able to meet them consistently for over 97 percent of its permits. LURC should adopt these same timelines and adhere to them.

❖ **Harmonize the regulatory processes used by DEP and LURC[7]**

As outlined earlier, because the two state regulatory processes have somewhat different mandates and have evolved independently, LURC and DEP now have somewhat different processes, forms, etc. for processing wind power development projects. These should be

[6] Permit review timeframes can be put on hold at the request of an applicant to allow the applicant to gather more information required to meet applicable standards. By allowing applicants to put applications on hold, the DEP does not need to deny an application which it might be able to approve with the proper information, and applicants avoid the need to withdraw and resubmit the entire application, unless they prefer to do so.

[7] DEP and LURC should be directed to revise their administrative procedures to ensure that wind power permit applications are processed as uniformly and expeditiously as possible statewide, and to that end to make administrative changes that may be accomplished under existing law (rule or statute) as soon as practicable. The agencies would consult with interested parties in making such changes. The agencies should also be directed to initiate rulemaking (minor technical rules) and identify any statutory changes necessary to that end as soon as practicable. The Task Force suggests that the agencies jointly report to the Legislature on recommended statutory changes. Potential changes in administrative procedures include, but are not limited to, creation of a common application form and application fee schedule (for DEP the removal of the special fee cap will allow more use of outside experts); creation of common protocols regarding information needed to review key issues; creation of a common and clear approach and schedule for determining if an application is complete for review; developing a schedule for application processing; using consultants to facilitate review; developing a common criteria for decisions on when to hold a public hearing; and developing common procedures for circulating draft orders.

harmonized to facilitate the process for reaching a decision on wind power proposals as soon as practicable.

❖ **Refine LURC's approach and standards for the review of certain issues**

LURC lacks specific standards for the review of certain issues commonly raised by wind power projects or uses standards which are not as refined as those used by the DEP. While LURC's standards have proven comprehensible, the Task Force recommends that LURC adopt the same approach as DEP to review of the following issues:

- Bird and bat impacts, in accordance with study protocols as outlined in a memorandum, developed by DEP and DIF&W and presented to the Task Force at its January 9, 2008 meeting (see Attachment H).
- Noise (see related recommendation below)
- Shadow flicker (see related recommendation below)
- Impacts on scenic resources of state or national significance (see Attachments G and M).

The Task Force notes and endorses that the attached recommendations regarding guidelines for wind power project ecological studies (focused on assessing potential avian and bat impacts) and noise and shadow flicker (Attachments H and I, respectively) are to be used as guidance by DEP, LURC, IF&W and other review agencies. These are "guidance" rather than rules because the state of the science is advancing in these areas, particularly for evaluation of wind power projects. Using guidance rather than rules allows reviewing agencies to apply professional and scientific judgment to adjust the guidance. This is particularly important if, as we expect, significant study over the next two to three years advances the state of the science on these issues. These attachments reflect current scientific understanding of these issues as reflected in for example the National Research Council of the National Academies' "Environmental Impacts of Wind-Energy Projects" (2007).

❖ **Clarify state approach to noise and shadow flicker issues**

In accordance with information presented by DEP Commissioner Littell, the Task Force finds that, with one exception (see below), no change in DEP's rules is needed to address wind power projects' potential noise impacts. The Task Force further finds that shadow flicker, which may be an issue with some proposals, is an issue which is amenable to objective, quantitative assessment and that DEP and LURC can appropriately address this issue under existing authority. Accordingly, the Task Force recommends that:

– DEP amend its Site Law rules (Chapter 375.10(E)) to give DEP clear authority "to establish any reasonable requirement to ensure that the developer has made adequate provision for the control of noise," and that DEP adopt the several refinements of its approach, under existing law, for assessing wind projects' potential noise impacts, both prior to and after construction, outlined in the memorandum presented to the Task Force at its January 9, 2008, meeting (see Attachment I); and

– DEP and LURC develop guidance, for adoption by both agencies, on protocols to address noise and shadow flicker issues, which includes identification of information that applicants must provide and how that information will be assessed.

- **Refine LURC's Comprehensive Land Use Plan**

  The Task Force recommends that LURC be called upon to refine its Comprehensive Land Use Plan (now under revision) to deal with wind power development in a manner consistent with these recommendations.

- **Ensure tangible benefits for Maine people**

  Consistent with the Governor's third objective for the Wind Power Task Force, "To maximize the tangible benefits Maine people receive from wind power development," the Task Force recommends adding to the regulatory approval criteria for a wind power project that, in addition to meeting environmental standards, projects be found to provide significant tangible economic or environmental benefits to Maine people. These projects may include but are not limited to the following: construction-related employment; local purchase of materials; employment in operations and maintenance; property taxes; reduced electrical rates; natural resource conservation; or other comparable benefits, with particular attention to assurance of such benefits to the host community and communities that surround the wind power project; and that construction, operations and maintenance activities shall be performed by trained, qualified and licensed workers in accordance with 32 MRSA chapter 17 and other applicable laws. This additional permitting requirement is justified because wind power development will receive expedited permitting as outlined above, and has unique, unavoidable effects on public resources and public uses.

- **Ensure that all commercial wind power projects meet state rules regarding noise and setback**

  As noted above, the Site Law is triggered by the scale of development: in general, a development project of 20 acres or more in size or which creates 3 acres or more of impervious surface triggers state jurisdiction under the Site Law. As noted earlier, such a project is termed a "grid-scale wind power project" in this report. Consequently, some smaller but yet commercial wind developments (a project whose primary purpose is generation of power for sale to the grid as opposed for the generator's own use) will not trigger the Site Law would not be subject to state review and siting requirements that address noise, shadow flicker, safety and related concerns. Given the relatively recent emergence of the wind industry in the state, few Maine municipalities have ordinances that address wind energy development specifically; and many municipalities may lack the technical resources needed to evaluate potential noise and related impacts from commercial wind facilities. The Task Force notes that a commercial wind power project, even if not grid-scale, could present noise-related or shadow flicker effects of concern to persons who live in the vicinity. In order to ensure consideration of these issues, the Task Force recommends that, if the proposed development involves location of turbines in a municipality and is not otherwise subject to DEP permitting under the Site Location of Development Act, a developer obtain from DEP a certification that the proposed facility meets the requirements of DEP's noise control regulations promulgated under the Site Law, and pertinent DEP siting requirements regarding shadow flicker.

  Research into the issue of safety-related setbacks for wind energy turbines shows that the setbacks developed in other jurisdictions through ordinance and regulation vary from 105 percent of the tower height (including rotor extended vertically) to more than 1,000 feet, and

differ as well regarding the point from which setback is measured (e.g., property line or dwelling). Setbacks appear to have been designed to address potential concerns such as ice throw, rotor throw, and tower collapse. The Task Force notes that one turbine manufacturer, General Electric (GE), suggests a distance of 1.5 times the total height of the tower (hub height plus rotor diameter)[8] to address the risk of ice throw. The Task Force notes that for planned development subdistricts LURC has a general setback requirement of 400 feet, which may be greater or lesser to address project-specific circumstances. In the state's organized areas, development setback is an issue typically addressed through local ordinance. The Task Force did not evaluate the merits of particular setbacks, and accordingly, makes no recommendation regarding specific standards. The Task Force does believe that this is an issue which should be addressed, as appropriate, in making land use permitting decisions. Accordingly, with due consideration of GE's above-noted setback recommendation and that of other manufacturers or professional associations, the Task Force suggests that both DEP and LURC ensure this issue is addressed in accordance with their current authorities (amended if necessary). Further, the Task Force recommends that DEP, in the context of the certification for commercial projects not otherwise subject to state review as suggested above, recommend a setback appropriate to protect public health and safety, based on the recommendation of a qualified engineer.

The Task Force notes that a municipality may decide to address these and additional issues through a local ordinance more stringent than pertinent DEP standards. The Task Force suggests that the recommended model state ordinance (see Section III) be designed to facilitate well-coordinated local and state review.

The Task Force suggests that DEP be authorized to charge a developer an appropriate fee for this review and certification, which may be conditioned on specific siting requirements, potentially including setbacks from residential structures, as appropriate. In addition, the Task Force recommends that DEP's certification decision itself not be within the original jurisdiction of, or subject to appeal to, the BEP, or subject to judicial review other than as an aspect of an appeal of a pertinent municipal land use decision.

Conclusion on Permitting Wind Power Development in Maine

In sum, the Wind Power Task Force is persuaded that there are a number of problems with the state's existing regulatory system, that these problems are significant, and that they deserve serious attention. These problems have arisen because Maine's environmental licensing process was initially set up almost 40 years ago, long before grid-scale wind power development was seen as a viable use of the Maine landscape. The Task Force has observed that these problems have resulted in considerable confusion and frustration from several perspectives, including those of developers, regulators, other decision-makers, and persons who care about expediting the development of Maine's wind resources, as well as those focused primarily on maintaining Maine's special quality of place.

The Task Force is persuaded that resolving these problems, as outlined earlier, will indeed assist Maine in assuming a leadership position on wind power development in the Northeast, while maintaining its special quality of place and providing tangible benefits for Maine people.

[8] See: http://www.gepower.com/prod_serv/products/tech_docs/en/downloads/ger4262.pdf.

III. Encouraging Community-Scale Wind Development

Currently, approximately one percent of Maine's electrical generation is from wind power, and a tinier percentage than that comes from small and community-owned wind generators. Yet the state has enough potential wind power resources to provide a far higher percentage. The benefits of wind power are not just available in the large-scale setting of wind farms where the generated power is sold to electrical utilities. Economically and socially beneficial applications using residential-sized up to commercial-sized wind turbines on a smaller scale are also possible. The purpose of this section is to present the potential benefits of, and barriers to, small and community-scale wind power in Maine, concluding with recommendations to remove barriers and promote additional small and community wind in Maine.

Generator Sizes

For purposes of this discussion and the ensuing recommendations, three sizes of wind generators are discussed:

1. Small, so-called "appliance" or residential-sized turbines for individual residences or small businesses (up to about 20 to 25 kilowatts [kW]);
2. Medium-sized turbines that are above residential-sized up to 250 kW, and may be at roughly the state's net metering limit (100 kW), that might be useful for groups of homes, schools, or larger electricity users;
3. Larger projects comprised of turbines exceeding the medium-sized class, ranging from the typical 660 kW machines to 2 MW turbines. Ownership in these projects has a primary community component, though there may be a developer involved due to financing and technical resources needed to complete a project.

Differentiating among the three scales of community wind becomes important for some of the particular recommendations below.

Ownership Patterns

Small and community wind projects are defined not only by size, but also by ownership. By definition the category excludes wind power development by commercial wind power developers as primary owners. Community wind is defined as generation capability owned by individual homeowners, individuals or groups of local investors forming LLCs, or by local institutions such as hospitals or businesses, or as wind projects developed and installed on public property by a municipal entity, such as a municipal utility, school district, county jail, or other small jurisdiction. These owners may partner with commercial developers for technical or financial reasons.

LLC Ownership Flip Model. One ownership model of particular interest is based on the so-called Minnesota "Flip Model," which allows outside investors to become a partner by underwriting up to 45 percent of the cost of the project in return for federal income tax benefits.

Ownership of the project is flipped back to the local entity when the federal tax benefits cease after 10 years.

Small and Community Wind Potential

Small and community wind projects have the potential to positively affect public acceptance of wind power, while in some cases also contributing clean, renewable power to the electrical grid. It is anticipated that the eventual appearance of wind turbines in many locations spread across the state will raise public awareness that wind indeed is a usable resource for power generation and that technology exists to exploit it. With increasing public awareness that fossil fuel generation is a major cause of global warming, wind power will likely come to be seen as a good way for citizens to take responsibility for and mitigate the environmental impacts of traditional electricity generation. Community wind projects provide an important opportunity to educate the general public on issues associated with climate change, reduction in carbon dioxide emissions, and alternative energy sources. By their nature, community wind projects do not raise some of the issues that larger-scale projects do. These aspects of community wind should be taken advantage of – the value of community wind projects goes beyond basic economics. Today's small residential-scale wind systems cost as little as $13,000 installed, which makes this technology accessible to individual consumers. Bringing the option of wind energy to everyone allows people to become involved in the overall goals of the state.

While the Task Force's subcommittee viewed the major potential of community wind as primarily educational, the point should not be lost that in some countries with major wind power contributions to the grid, community wind is the dominant form of ownership.

For example, 84 percent of the turbines in Denmark are owned by residents instead of commercial investors (Bolinger 2004). In Germany 88 percent of the turbines are community-owned (Bolinger 2004). This picture offers evidence that, over the long term, community wind in Maine could move from small-scale educational and awareness-raising efforts to larger-scale contributions to the electricity generation system. In Maine, more than 50 small/residential-scale wind systems were installed in 2007 including one at former President Bush's home in Kennebunkport. More than 150 additional small/residential-scale wind systems are expected to be installed in Maine in 2008.

Economic Contribution

A study developed by the University of Minnesota determined that community wind in the United States has a greater impact on local economies than does corporate wind (Kildegaard & Myers-Kuykindall, 2006). According to the study, "community wind has four times the economic impact on local value added, and 2.8 times the impact on local job creation, relative to a corporate-owned development."

Barriers to be Overcome

- **Land use restrictions.** Local land use ordinances may not address wind turbines, resulting in uncertainty over what local standards may apply to a project.
- **The high cost of feasibility studies.** The feasibility study portion of project development may be difficult for some projects. Typically, feasibility studies cover financial, wind speed

and duration, siting, and grid-connection components, all of which may be complex issues depending on the scope and size of a proposed project.

- **Poor wind resources.** Current technology limits the locations where wind power can be sited due to low wind velocities.
- **Access to transmission lines.** Some prime locations for wind power development may be at sites far from existing transmission lines – this too can limit feasibility.
- **Interconnection process.** Interconnection studies, and the process of arranging to connect to the grid, may be difficult for some projects.
- **Securing financing.** Arranging for financing may be difficult, particularly for projects lacking a private partner.
- **Lack of state incentives.** Lack of state incentives may hinder financing and/or economic viability.
- **Lack of support from the community.** Community support is important for gaining local approvals – this highlights the potential importance of the educational aspects of such projects.

Recommendations

❖ **Develop a model municipal wind power ordinance**

– The model ordinance is intended for voluntary use and adoption in municipalities statewide. It is intended to serve as an incentive for the development of wind power by providing standard ordinance language. Since few communities have such ordinances currently, SPO should: 1) monitor adoption and implementation of local wind energy ordinances to determine if the model ordinance is enabling communities to reasonably regulate wind energy[9] and successfully address wind energy project-related issues; and 2) develop and periodically recommend changes to the ordinance's provisions as warranted. The model ordinance should address issues of potential community concern including setbacks, height, and noise issues, and address three general classes of community-scale wind (smaller-scale, medium, and larger).

Lead agency: SPO; complete by Spring 2009

❖ **Remove obstacles at the pre-construction stage**

– Support and expand the PUC agreement with the University of Maine to build capacity in Maine to assist with meteorological studies. This partnership is also a logical one to expand upon to help address other obstacles to wind power development (such as assistance with economic analysis). The Task Force recognizes that additional funding may be needed to expand this partnership.

– Request the PUC to study and develop appropriate rules regarding fee structures and timelines for utility companies to respond to requests for interconnection studies. The Task Force recommends a report back to the Legislature's Joint Standing Committee on

[9] If communities are found to be unreasonably blocking wind energy development, additional actions may be justified.

Utilities and Energy (Utilities and Energy Committee) on findings and recommended rule changes to correct deficiencies in present practices by January 2009.

– Investigate use of existing cell phone towers as sites for collecting meteorological data (MET studies).

Lead agency: PUC; complete by Spring 2009

❖ **Provide a data clearinghouse**

– Assist with other aspects of wind power development by building a knowledge base, using the PUC-University of Maine partnership mentioned above as a foundation, and drawing in Maine Maritime Academy and the Community College System.

Lead agency: PUC; ongoing responsibility.

– Expand the OEIS to include a clearinghouse and outreach function to provide information to the public on available grants, consultants with special expertise, and lists of equipment providers.

Lead agency: OEIS, through legislative approval as necessary.

❖ **Provide financial incentives/economic assistance**

– Redefine PUC proximity rule such that proximity means within a service territory

Lead agency: PUC; report to Utilities and Energy Committee by January 2009.

– Develop revolving loan program (i.e., Efficiency Maine) to assist in feasibility studies. PUC currently has a program for renewables that is geared to construction; the program's rules should be refined so that work at the feasibility stage would be eligible as well.

Lead agency: PUC; report to Utilities and Energy Committee by January 2009.

– Allow net metering at or below 100 kW for generation capacity in group ownership.

Lead agency: PUC, working with Utilities and Energy Committee.

– Offer rebates for small installations (appliance size) similar to the solar rebate program presently offered at the PUC. This could be done as an expansion of the existing solar program, recognizing wind power, like solar power, as an emerging technology but with better paybacks and fewer technical drawbacks. A stipulation should be included that installations be done at sites that at a minimum demonstrate class 2 wind resource according to AWS True wind maps or other wind data.

Lead agency: PUC, working with Utilities and Energy Committee.

– Provide Business Equipment Tax Rebate (BETR) treatment for wind generating equipment above the appliance size.

Lead agency: OEIS and Maine Revenue Services, working with the Legislature's Joint Standing Committee on Taxation (Taxation Committee)

– Provide sales tax exemption for all small and community wind power equipment.

Lead agency: OEIS and Maine Revenue Services, working with Taxation Committee

❖ **Designate a facilitator within DOE/PUC to engage Maine schools in the Wind for Schools Program[10]**

– The Wind for Schools program currently involves five states (Colorado, Kansas, Nebraska, Montana, South Dakota); five additional states are planned for Spring 2008. Maine should become engaged in this effort.

Lead agencies: US Department of Energy/PUC; as soon as possible to take advantage of program planning.

❖ **Enhance the involvement of Maine's education system**

– Investigate the need for additional research and development funding in the University of Maine System and/or Maine Maritime Academy.

– Direct the community college system to investigate wind power training needs.

The Task Force recognizes that state agencies' abilities to provide the financial and technical assistance recommended in this section and elsewhere in the report will be contingent on the funding available for these purposes.

Responsible entities: Request University System, Maine Maritime Academy and the community college system to report back to Governor/Legislature by September 30, 2008.

IV. Optimizing the Economic Benefits of Wind Power to Maine Communities and People

The Task Force believes that growth in wind energy generation in Maine is a necessary and appropriate element of an overall energy strategy to help meet state, RGGI and other renewable energy objectives, and to increase the reliability of Maine's electricity supply. The Task Force further believes that, guided by the recommendations outlined in this report, this growth will optimize the benefits for Maine citizens through projects which minimize and offset the potential, project-specific adverse effects of wind energy development on natural resources, public uses, and community amenities, while providing clear and tangible benefits to communities that host wind energy facilities, as well as to society as a whole.

The ability of Maine to achieve the ambitious goals for wind power development suggested in this report and to bring the many benefits of wind energy to Maine people depends, in part, on the existence of sufficient transmission line capacity. Most of Maine's existing transmission system was developed over four decades ago, and was designed to service hydropower and other traditional electricity generation systems. Maine's utilities and independent transmission companies are currently studying substantial new investment in transmission across the state. The implications of these potential projects for wind power development are among many factors – along with reliability, cost to consumers, siting considerations, and other issues – that

[10] http://www.eere.energy.gov/windandhydro/windpoweringamerica.

will go into determining whether projects are built. In order to realize the tremendous potential of wind power in Maine, the existing challenges of interconnecting wind projects with the grid must be addressed.

The challenge of improving Maine's transmission capacity and reliability will require responses from both Maine and the New England region, particularly to work out issues like allocating the costs of new transmission among its beneficiaries. In the past, new transmission lines have also faced significant siting challenges.

These potential improvements to Maine's transmission system, including where upgrades are made, how much capacity is expanded, and how this investment will be paid for, will have implications for all types of generation, including wind. Experience in others states and in Europe suggests that a proactive approach to the transmission issues associated with wind power can be very helpful in achieving renewable power goals and minimizing conflicts over siting.

Notwithstanding the significant environmental, economic, and energy-related benefits of extending its reach in Maine, wind power development, like all development, has potential for associated adverse effects on certain natural resources, public uses, and community amenities in the areas developed. By its nature, wind energy development involves a land use that is new to Maine. Land requirements for wind energy projects vary widely depending on many issues including turbine size, topography, and project layout among others. Projects in Maine to date (Stetson, Kibby, and Mars Hill) have used an average of about 5 acres per MW of installed capacity. Projects may, in some circumstances, allow existing land uses to continue in and around the turbine; for example, agricultural and commercial timber harvesting uses may often continue.

Wind power's notable benefits, such as reduced reliance on fossil fuels and their attendant air quality and climatic effects, are enjoyed by the public generally; but the project-specific effects, such as noise and wildlife and recreational impacts, are experienced locally. As the National Academy of Sciences states in its 2007 report assessing the environmental impacts of wind power development:

> "[T]he environmental benefits of wind energy, mainly reductions in atmospheric pollutants, are enjoyed at wide spatial scales, while the environmental costs, mainly aesthetic impacts and ecological impacts such as increased mortality of birds and bats, occur at much smaller spatial scales" and that "[T]here are similar, if less dramatic, disparities in the scales of occurrence of economic and other societal benefits and costs." (National Research Council of the National Academies 2007, p. 148)

The Task Force notes that concerns have been expressed that as wind energy expands its footprint in the region, Maine may bear a disproportionate share of the costs and impacts associated with meeting the broader region's need to reliably meet its energy needs while reducing emissions. The Task Force's recommendations seek to optimize the benefits of wind energy to Maine, in ways that appropriately address the disparities noted above. The recommendations include suggested improvements to the state regulatory process to ensure that project-specific environmental impacts, along with project-specific economic benefits, are considered in a manner appropriate to wind energy development (see Section II above); encouragement for current efforts to address transmission issues as needed to facilitate growth of

the wind industry in Maine; and initiatives to realize the tangible economic benefits that the wind power industry can bring to the state.

Recommendations

- **Continue current state energy policy-related efforts to ensure that diversification of the state's energy mix and development of transmission infrastructure benefit Maine**

  PUC Chairman Kurt Adams briefed the Task Force on the Commission's current efforts to ensure that the development of new generation (including wind power) needed to diversify the state's energy mix and transmission infrastructure is beneficial to Maine electricity consumers. The Task Force understands that the Commission and other state officials continue to work on a regional level, along with other New England states and Canada's Maritime provinces, to explore opportunities for Maine to meet demand for diverse, non-carbon emitting electricity resources in a manner that benefits Maine.

  One possible outcome of these efforts, described in detail in the Maine/New Brunswick Phase I Report (June 26, 2007) and the Commission's Final Report on Maine's continued participation in ISO-NE (January 15, 2008), are incentives for Maine to site wind power and other renewable generation facilities as well as necessary transmission.

  The PUC anticipates conducting a comprehensive review of the state's transmission system during 2008 in the context of expected utility transmission expansion and upgrade proposals. The review will include an assessment of the system in light of the substantial potential for wind power development throughout various areas of the state and the need for expansions and upgrades to integrate new wind power projects into the region's electricity grid. The Task Force finds these current and future efforts to be valuable in attaining benefits from the development of wind power for Maine citizens and electricity consumers, and accordingly, strongly recommends that they continue.

  The Task Force notes that the states of Texas and Colorado, for example, have taken affirmative steps to identify and address inadequate transmission infrastructure serving areas with significant wind power development potential, and where significant conflicts over siting are not expected. Although the Task Force recognizes that approaches in these or other jurisdictions may not be well-suited to Maine, given differences in energy markets, economic conditions and other factors, the Task Force does believe that considered attention to this issue, in the context of current decision-making regarding Maine's transmission system, is important.

  Lead agency: PUC; ongoing

- **Encourage developers' efforts to provide direct economic benefits to communities that host grid-scale wind power projects through preferential access to or favorable rates for power generated by the project**

  In several instances in Maine, wind power developers have entered into voluntary agreements with host communities or Maine businesses to provide power at favorable rates or other energy-related benefits. In testimony to the Task Force, Jack Cashman, policy advisor to Governor Baldacci, noted the existence of an agreement to effect the sale of power

from a wind power generator to a manufacturing company at a negotiated rate that will help stabilize the company's long-term power costs and suggested that it provides a model for ensuring tangible public benefits.

The Task Force believes that agreements which produce direct and tangible economic benefits to communities that host grid-scale wind power projects should be encouraged. The Task Force furthers believes that developers' commitments to provide benefits should be considered as appropriate in regulatory proceedings regarding siting of wind energy facilities (see Section II).

Lead agency: No specific implementation action required

❖ **Actively explore opportunities to site and support the growth of wind energy-related businesses in Maine**

At present, Maine is the leader among the New England states in terms of installed wind energy capacity. This creates an opportunity and potential advantage for Maine in attracting new wind energy-related businesses, given the growing level of in-state experience and expertise that is relevant and of value to the wind industry. The University of Maine Advanced Engineering Wood Composite Center's (AEWC) current research and development initiative focused on development and testing of new composite wind blade technology is illustrative. A key aim of this initiative is to attract Vestas, one of the world's leading wind turbine manufacturers, to locate a planned North American research and development facility in Maine.

The Task Force suggests that the state, through the work of DECD and other agencies, can play a key role in fostering growth and development of a variety of wind energy enterprises in Maine. DECD is currently working with the wind power industry in Maine. Accordingly, the Task Force suggests that DECD take the following actions:

– Cooperate and assist the University of Maine AEWC's efforts to spur development of wind power-related manufacturing in Maine; and

– Form an advisory committee, comprised of wind power development companies active in Maine, to explore opportunities for business attraction and development of wind power and other renewable energy-focused business clusters, perhaps through a cluster enhancement grant from the Maine Technology Institute.

Lead agency: DECD; action recommended as soon as practicable in relation to current pertinent DECD efforts

❖ **Encourage public-private partnerships to develop workforce capacity in Maine to support the wind energy industry**

In addition, as indicated above in its recommendations regarding community wind, the Task Force encourages the state's higher education institutions, professional associations, and wind energy developers to actively explore formation of public-private partnerships to develop and fund educational programs to provide Maine students and professionals the knowledge, skills, and training needed to service and support wind energy facilities. The rapidly growing wind industry could provide suitably trained Maine electrical workers,

environmental consultants, engineers, project managers, assemblers, manufacturing workers, and other professionals with opportunities in relation to projects in Maine, other states and Canada.

Lead agency: DECD/Wind power advisory committee (see prior recommendation); action recommended as soon as practicable in relation to current pertinent DECD efforts

❖ **Explore provision of incentives to communities that host grid-scale wind power projects through PUC's Efficiency Maine Program and the Carbon Savings Trust Fund**

Efficiency Maine, which is a statewide program administered by the PUC, promotes efficient use of electricity and reduction of customers' electric costs through education, grants and loans to assist businesses and residential ratepayers with energy efficiency initiatives. Funds for Efficiency Maine come from electricity customers through a system benefits charge (35-A MRSA §3211-A).

The Legislature created the Energy and Carbon Savings Trust Fund to support and implement goals of the cap-and-trade program in legislation authorizing Maine's participation in the Regional Greenhouse Gas Initiative, PL 2007 c. 317. The Fund, which begins its work in July 2008, is to be funded with revenues from sale of carbon dioxide allowances and forward capacity market[11] or other capacity market payments received pursuant to the RGGI program. Three trustees are to be appointed to administer the Fund.

The Task Force recommends that the Legislature's Utilities and Energy Committee consider amendment of the legislation governing the administration of each of these programs to include an equitable means to give business and residential customers in a municipality or unorganized township in which a grid-scale wind power project is located tie-breaker status regarding an application for funding of a qualifying energy efficiency project. Such means may include a requirement that such an applicant's grant proposal be afforded additional points as compared with otherwise equivalent competing proposals. This tie-breaker status would only apply when two comparable projects are exactly tied in the ranking by the Carbon Trust.

Lead entity: Utilities and Energy Committee, with information from PUC and DEP; for consideration during First Regular Session of the 124th Maine Legislature

❖ **To the extent Maine tribes wish to do so, explore potential state roles, if any, in addressing financing-related barriers unique to Maine tribes interested in development of commercial wind power facilities**

The Task Force notes that the PUC's 2005 report on feasibility of wind power in Maine indicated that there may be significant potential for development of wind energy on lands of

[11] The objective of the Forward Capacity Market (FCM) is to purchase sufficient capacity for reliable system operation for a future year at competitive prices where all resources, both new and existing, can participate.

the Passamaquoddy Tribe and Penobscot Nation, and that "the Maliseet and Micmac tribes are in earlier stages of considering wind power potential." The Commission further found that:

> "The development of wind power on tribal lands, however, faces the same obstacles as development in other areas of the state. As with any wind power project, the major difficulty is obtaining long-term financing on reasonable terms. This problem is made more complicated in that the applicability of state laws related to financing and contractual remedies with respect to projects on tribal land is less clear than for other projects. This creates some uncertainty that could make financing more expensive or difficult to obtain. Ownership of facilities on tribal lands appears to be a high priority for the tribes. However, the tribes generally do not have the funds for large equity investments. In addition, tribal ownership could negate the benefit of the federal PTC because the tribal projects are generally not taxable; a relatively large taxable corporation would likely need to be involved as an equity owner for at least the 10-year life of the PTC."

In accordance with this PUC finding, the Task Force recommends that the DECD consult with the Passamaquoddy Tribe, Penobscot Nation, Houlton Band of Maliseet Indians, and/or the Aroostook Band of Micmacs, regarding their interest in further discussion with the state of the potential financing-related issues raised in the PUC's report; and that DECD coordinate an effort among the PUC, FAME, and the interested tribe(s) to explore the above-noted issues in PUC's report and develop recommendations for further action to address them, for consideration by the Governor.

Lead agency: DECD; Fall 2008

V. Providing State Economic Incentives to Foster Development of Wind Energy and Related Businesses

In general, direct economic benefits of wind energy development in Maine could include capital investment dollars and resulting property taxes and job creation, related not only to wind energy generation projects themselves but also project design, turbine manufacturing, construction, and operation and maintenance. Professor Orlando E. Delogu of the University of Maine School of Law provided the Task Force an overview analysis of the potential economic benefits of developing the wind energy industry in Maine (see Attachment J). As an example, the 42 MW Mars Hill facility now on-line involved a capital investment of about $95 million and will provide the town of Mars Hill $10 million over 20 years through the use of a tax increment financing (TIF) agreement. According to the developers of the Mars Hill project, during construction over 300 Maine people (from a variety of disciplines and firms) were employed; their permanent in-state employment group now numbers 13. Extrapolating these numbers, developing the wind energy industry in Maine to the 2,000 to 3,000 MW level in keeping with the goals the Task Force recommends could result in billions of dollars of capital investment and the creation of thousands of jobs. Additionally, as Professor Delogu points out, if a sufficient number of projects are in the pipeline, economies of scale would likely lead to additional

development of support industries (blade manufacturing, technology advancement, etc.) in Maine. Finally, there could be additional economic benefits in Maine related to electricity rates and the potential for land conservation, which ahs been proposed as a part of some projects.

The economics of wind power are based on whether the combination of the wind resource, transmission costs, market prices, and government incentives are enough to cover the cost of purchasing, installing, and operating the turbines. Wind power has reached the point where it can be cost-competitive against more conventional fossil fuel-based generation, if located at sites with adequate wind speeds, access to transmission lines, and transportation infrastructure to facilitate tower construction and turbine delivery.

The cost to generate power from wind may decrease in the future. As technology improvements increase efficiency, more electricity will be generated for each dollar invested. Additionally, the financing costs may also go down. The average wind project spends more than 60 percent of the development costs to pay for equipment and construction (Wiser and Bolinger 2007). A small change in the interest rate on loans can have a significant impact on profits. Today, financing cost tends to be higher for wind because it is still considered a higher-risk investment when compared with more conventional energy projects. As more wind is successfully incorporated into current generation and distribution, such perceptions of relative risk are likely to abate.

Since electricity can't be stored, the electricity market requires complex regulation and system controls to match supply to demand. A non-profit administrative organization called the ISO-NE operates the New England power grid and oversees the wholesale electricity market. ISO-NE administers an auction that determines the wholesale price paid to generators. The price paid to all generators is equal to the price of the last megawatt of electricity required to meet current demand. This ranges from $22 per megawatt hour (MWh) on the slowest days to a $1,000 per MW at peak demand. In 2006, the price was between $40 and $80 per MWh 90 percent of the time with the average $56 per MWh. (ISO-NE 2006, p. 42).

Wind power, along with other renewable sources, has an advantage in the market. Each New England state has a renewable portfolio standard (RPS). This requires that a certain percentage of electricity used to meet retail demand come from renewable sources. Maine, Connecticut, Rhode Island, and Massachusetts apply their respective standards to current sales. The percentages range from 2.5 percent to 30 percent, but use different definitions of renewable. Wind is recognized as renewable under all standards.

The RPS establishes a market for Renewable Energy Certificates (RECs). In order to meet its renewable energy obligation under an RPS, a supplier may purchase a credit representing production from a renewable source separate from the electricity. Providers of renewable energy are credited with one REC for each megawatt hour they produce. An Alternative Compliance Payment (ACP) is paid by the utility or supplier if it is unable to purchase enough RECs to meet the RPS requirements. This establishes a cap on the price of RECs.

Most of the New England states are increasing their RPS requirements for the future. Currently, RECs from older renewable energy facilities have little value, usually well below the ACP. However, RECs from facilities that began or restarted operations after about 2000 are paid premium prices in Massachusetts, Connecticut and Rhode Island. According to the ISO-NE (2006), "the New England renewable projects in the ISO Generator Interconnection Queue will not provide sufficient energy to meet the aggregate RPS energy requirements set for New

England for 2010." Unless more renewable resources are developed, the price of RECs will increase and one may expect that price increase to be passed on to electricity customers.

An additional incentive for wind development is the future implementation of the Regional Greenhouse Gas Initiative (RGGI). RGGI is a ten-state CO_2 cap-and-trade program being developed and implemented in the Northeast. Under RGGI, the Northeast region must limit CO_2 emissions in 2009 and place a cap on them by 2014. The cap will be reduced by 10 percent in 2018.

The federal government currently supports the development of wind power by offering tax incentives. In order to encourage electricity generation from renewable, domestic sources wind power providers are offered a Production Tax Credit (PTC). This allows a 1.9 cent deduction per kilowatt produced in the first 10 years of operation. The credit requires regular renewal from Congress and has been allowed to lapse several times in the past. The latest renewal extends the credit to all facilities operational before December 31, 2008. The PTC enables many wind power providers to compete in current markets where they otherwise would not be able to. Although the PTC provides a significant benefit to wind developers, the threat of its lapse may impede progress on development that is not in place before the expiration date.

The second major incentive offered by the federal government is Modified Accelerated Cost Recovery System (MACRS). This is another tax incentive that allows wind developers to deduct the depreciation of their capital from their income in a manner termed five-year double declining balance accelerated depreciation. This compares to 15-year, 150 percent declining balance for natural gas plants. By reducing taxable income, a wind project's tax liability is greatly reduced.

In testimony to the Task Force, Maine's Public Advocate and the PUC chair observed that provision of area-specific development incentives for wind power development has potential to facilitate creation of alternative energy clusters, renewable energy-focused industrial parks, or comparable aggregations of renewable energy-related businesses. At the state level, Maine has two areas of state tax policy that although not specific to wind power could be utilized by developers of wind power projects – these are the use of tax increment financing and the Pine Tree Development Program. PUC's above-referenced 2005 wind energy report recommended against additional state tax incentives to promote grid-scale wind generation development; and in testimony to the Task Force, PUC reaffirmed this perspective. In their testimony to the Task Force, wind power representatives did not suggest that additional state tax incentives are needed to allow wind power development in Maine. Developers did, however, explain the appeal and importance of state policy that makes project-related taxes predictable and cited Maine's tax increment financing (TIF) program, which stabilizes taxes over a multi-year assessment period, as an example of an effective program which was used for UPC's Mars Hill project (which essentially has a set tax payment per megawatt over a period of 20 years).

In addition to the use of TIFs, an additional incentive for wind energy development is available through the state's Pine Tree Development program, which has been successful in facilitating growth and development in a variety of places around the state. Focused on encouraging manufacturing businesses, the program provides a package of income, sales and property tax-related incentives ("Pine Tree Development benefits") to encourage business location and expansion in designated areas. The eligibility of wind power projects is based on a finding by the Maine Revenue Services, which determined that wind energy development, which in Maine's

deregulated market is undertaken by private developers as opposed to utilities, is a type of manufacturing that is eligible under current law for Pine Tree Development Zone benefits.

Recommendations

❖ **Retain current state tax incentives for wind energy development**

Wind energy development in Maine is currently eligible for benefits through the Pine Tree Development program and the use of TIFs. The use of a TIF program has been successfully applied in the Mars Hill project. Therefore, the Task Force recommends that current state and local taxation-related tools are adequate to facilitate siting of wind power generation and should continue to be used as appropriate in accordance with existing authorities.

Lead agency: No additional implementation actions suggested

❖ **Work with Maine's Congressional delegation to secure extension of the federal Production Tax Credit**

The federal Production Tax Credit (PTC), which as noted above has been a key element in financing wind energy development, lapses on December 31, 2008. The most recent federal energy bill, the Renewable Fuels, Consumer Protection, and Energy Efficiency Act of 2007 (H.R.6), became law without provision for extending the PTC for renewable energy facilities. Maine has a large number of proposed renewable facilities that are eligible for the PTC. For example, according to the ISO-NE Interconnection report, there are over 620 MW of proposed wind generation in Maine that could come on line by the end of 2009 (http://www.iso-ne.com). In each of two previous years when the tax credit lapsed, there was a 75 percent reduction in the number of new wind generators installed (http://www.awea.org/projects/).

Because it has played an essential part in supporting development, e.g., by providing the initial stability in pricing that is necessary to secure financing, the Task Force urges continuing efforts with Maine's Congressional delegation to ensure renewal and continuation of the federal PTC.

Lead agency: Governor's office, with assistance from PUC and SPO; ongoing.

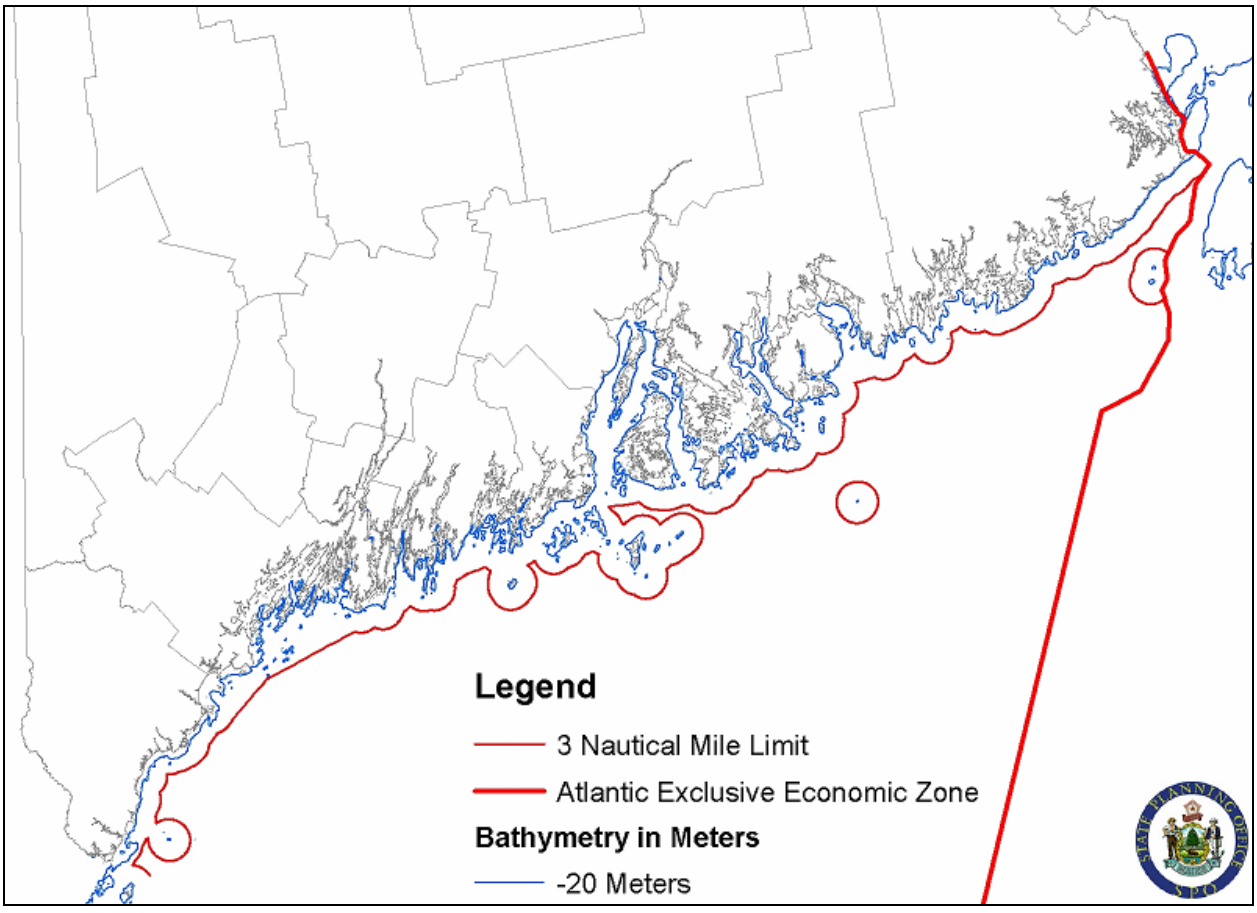
VI. Advancing Wind Energy Development in Offshore Waters

In Maine, all wind energy projects proposed to date have been on land. Consequently, the Task Force focused principally on issues associated with land-based wind energy development. However, as depicted in Attachment D, the wind resources off the Maine coast are considerable and offer much potential for future development. To help Maine take advantage of this potential, the Task Force discussed the issues associated with offshore wind energy development and developed recommendations for addressing these issues. This section of the Task Force report discusses how Maine can: a) further our understanding of the characteristics of nearshore and offshore wind and operating conditions; b) improve the regulatory process for wind energy in

coastal waters; c) work closely with federal regulators; d) engage coastal stakeholders; and e) advance new technologies.

Generally speaking, because many offshore areas around the world have high wind energy potential, enhancing offshore wind energy technology is currently a focus for the industry. Siting wind turbines offshore requires consideration of available wind, water depth, substrate type (e.g., sand vs. ledge) availability of construction equipment and expertise, cost, and transmission line placement. Much of the potential electricity generation offshore Maine is in water deeper than current technology-based depth limitations, which range from 50 to 75 feet (Coakley 2008; Applied Technology and Management, Inc., et al. 2007; Musial 2007) – compare Figure 1 (shown earlier) with Figure 3, which portrays the 20-meter (approximately 60-foot) bathymetry line in relation to the state and federal boundaries. Notably, offshore projects in Europe are generally situated in water depths of less than 60 feet (Firestone et al. 2006). While some pilot projects are being developed in deeper water (about 125 feet), in general wind industry experts envision that the improvements in technology needed to improve the economic viability of offshore projects are on the order of ten years in the future (Coakley 2008). Attachment K provides an overview of current challenges and anticipated advances in offshore wind energy technology. Despite these challenges, it is clear that the high wind energy potential in deep waters directly offshore Maine is an opportunity for the wind power industry.

Figure 3
Water Depth and Jurisdictional Boundaries Along Maine's Coast



A second aspect of the drive toward new technologies is related to the need for specific information that is necessary to characterize wave and current conditions for project engineering purposes (Cape Wind 2008). The National Oceanic and Atmospheric Administration and Gulf of Maine Ocean Observing System have monitoring buoys offshore Maine, but these are widely placed in the Gulf of Maine and measure wind at surface levels (rather than the hub height elevation of wind turbines). In his presentation to the Task Force, Maine Maritime Academy (MMA) professor Richard Kimball discussed a collaborative effort by the University of Maine, MMA, and the College of the Atlantic to obtain meteorological data on Mount Desert Rock, a small island approximately 20 miles south of Northeast Harbor, Mount Desert Island. Applying Maine expertise through efforts such as this will be very valuable in assisting the development of offshore technology. Advances in the use of remotely sensed data (e.g., through Light Detection and Sensing (LIDAR) and satellite date) may also lead to increased understanding of the offshore wind resource in a more cost-effective manner than individual meteorological tower-based studies (International Energy Agency 2006 and Musial and Butterfield 2006).

The Task Force believes that there is a knowledge base and expertise in Maine (through colleges, universities, and engineering and construction firms, for example) that positions the state well to become a leader in the development of offshore wind technology.

As can be seen from comparing Figures 1 and 3, not only is much of Maine's offshore wind potential in deep water; but in addition, much of the area with higher wind potential is outside of Maine's jurisdiction. Projects in the waters off of Maine's coast are in state jurisdiction if they are located three miles or less from the shore (i.e., in "state waters"). Projects that are located more than three miles from the shore are in federal waters. This distinction affects the regulatory review of potential wind energy development, since projects in state waters are subject to approval under Maine regulatory programs (e.g., NRPA) and state leasing authority through the DOC's Bureau of Public Lands. Wind energy development projects have not been reviewed through the lens of these programs, since no such projects have been proposed to date, and there may be new regulatory issues that offshore wind energy could raise. The situation is different in federal waters where Maine has only limited control over project siting and development. The federal Coastal Zone Management Act's federal consistency provisions do provide Maine with some influence over federal decisions that effect Maine's coastal areas. However, the federal government is currently refining its approach to these decisions. Recent changes in federal law aim at clarifying federal management authority regarding offshore energy development. The 2005 Energy Policy Act gives the federal Minerals Management Service (MMS) authority to manage alternative energy-related uses in federal waters, including wind power. The MMS is currently developing regulations "intended to encourage orderly, safe, and environmentally responsible development of alternative energy resources" (U.S. Minerals Management Service 2008). Maine has provided MMS with comments during the development of the regulations, which include a leasing provision for use of these public lands for alternative energy development.

The Task Force believes that the state's involvement in and monitoring of the development of federal programs related to the siting of offshore wind energy, such as through the MMS regulation development, is important. Additionally, recognizing the fact that offshore wind energy projects have not been proposed in Maine to date, the Task Force believes that an

examination of Maine's existing regulatory structure in state waters is warranted. This effort would involve having appropriate stakeholders look at the types of issues that such projects may raise, since the siting of new facilities in state waters could be a lengthy and contentious process due to the threat of displacement of current uses (related to ports, fishing, aquaculture, navigation, commerce, and/or recreation, for example), concerns of riparian owners, and environmental impacts. Some of this work has already begun. In 2007, Governor Baldacci issued an Executive Order[12] directing SPO and DMR to implement the recommendations resulting from a study of bay management conducted by these agencies. Implementation of this bay management study includes collection of new data on coastal resources, improved state agency coordination, ongoing interaction with coastal stakeholders and pilot projects in coastal regions to develop and test new approaches to management of state waters. The Task Force recommends that a pilot project related to wind power be pursued, as described below.

Recommendations

- **Aggressively pursue development of Maine's offshore wind potential**

  Maine should actively pursue development of its offshore wind potential.

  Lead agency: OEIS; ongoing

- **Streamline Maine's environmental laws as applied to offshore wind energy projects**

  In addition to involving different stakeholders, offshore wind power development proposals may present different or additional regulatory issues than those encountered by land based projects. Consequently, the Task Force recommends that DEP and LURC, in consultation with DMR, DIFW, and SPO/Maine Coastal Program, review the efficacy of pertinent environmental laws as applied to offshore wind energy development, review potential streamlining measures, and recommend any necessary statutory changes to the Governor.

  Lead agency: DEP, in coordination with LURC and SPO; by January 2010

- **Complete development of rules regarding leasing for large-scale projects and evaluate the potential for other wind power-related improvements to the state's submerged lands leasing program**

  The Bureau of Public Lands (BPL), in consultation with DEP, LURC, DMR, and DOC, should amend its submerged lands leasing rules, if and as necessary, to ensure an appropriate fee for large-scale projects, including potentially wind energy projects, and to make other potential improvements to its rules, if any are needed to address wind power-related issues efficiently and effectively, while maximizing benefits to the public from siting on state-owned land.

  Lead agency: BPL; initiate rulemaking in summer of 2008

[12] See http://www.maine.gov/tools/whatsnew/index.php?topic=Gov_Executive_Orders&id=35856&v=Article.

- **Promote dialogue with coastal stakeholders about nearshore and offshore wind power siting**

  SPO and DMR should consider the development of a pilot project to engage coastal stakeholders in proactive discussions about wind power, with the intent of understanding perceptions, potential impacts and possible obstacles to wind power siting off Maine's coast.

  Lead Agency: SPO and DMR 2009-2010

- **Develop guidance regarding siting of wind power development on state-owned submerged lands**

  SPO should work with BPL, and in consultation with DMR, DIFW and DEP, and other agencies as appropriate, to develop guidance regarding siting of wind power projects on state-owned submerged lands.

  Lead agencies: SPO and BPL; upon completion of above-noted rulemaking

- **Monitor and continue involvement in federal regulatory program development regarding offshore wind energy development**

  SPO, Maine Coastal Program, in consultation with other state agencies as appropriate, should continue its monitoring and involvement with federal regulation development, such as is currently occurring with the federal Minerals Management Service.

  Lead agency: SPO; continuing

- **Help position Maine's universities and colleges, and private engineering and construction firms to become leaders in offshore wind power**

  In partnership with Maine's universities and colleges, and appropriate private industry, DECD and Maine Technology Institute should explore ways to enhance the offshore wind power industry. Issues related to materials development, improvements in technology, construction expertise, cable placement, and others should all be explored.

  Lead agency: DECD and Maine Technology Institute; ongoing

- **Increase understanding of Maine's coastal wind resource**

  The Department of Marine Resources and the Maine Geological Survey (MGS), in consultation with SPO/Maine Coastal Program, should work with the Gulf of Maine Ocean Observing System, NOAA and other data providers to further characterize the wind resource off the coast of Maine through meteorological studies and remotely sensed data.

  Lead agencies: DMR and MGS; ongoing.

VII. Monitoring Technological Developments and Their Policy Implications

The basic architecture of wind turbines (three-blade turbine which operates at a fixed-speed and having a direct connection to the grid has not changed much in the previous decades, although as wind power's viability has increased many issues are being addressed (Industry Canada 2007). In general, these advances in technology, summarized below, are driven by a need for lower costs, enhanced reliability, higher efficiency, and reductions in grid impact. The focus of this section is on land-based technology. Section VI provides an overview of technological advances being pursued in the offshore.

- **Lowering costs**. Nationally, on a cost per kW basis, since the 1980s the cost for installation of wind turbines has fallen by roughly $2,700 per kW to approximately $1,500 per kW (US Department of Energy 2006). Much of that reduction occurred before the year 2000, however; since 2000, costs on a per kW basis have leveled out nationally or risen slightly, due in large part to recent increases in turbine costs (US Department of Energy 2006). In general, lowering costs has been a focus of much of the current efforts by both industry and government. Current research has a strong focus on reducing costs in several ways: cutting costs related to design improvements; lowering operations and maintenance costs; and improving efficiency.

  In addition, in response to issues associated with economies of scale, the current industry trend is to use larger turbines to lower per unit generation costs. At present, General Electric (GE) is the largest domestic manufacturer of turbines. GE's land-based 1.5 MW machine is most commonly used, although its 2 to 2.5 MW turbines are coming into use (Applied Technology and Management, Inc., et al. 2007). GE is developing a 3.6 MW turbine which should be commercially available in three to five years, and is also developing larger designs (up to 5 MW in size) (Applied Technology and Management, Inc., et al. 2007). The push toward larger turbines is not presently limited by material availability or industrial capacity according to the manufacturing industry (Lyons 2007), although the current supply of turbines for certain applications is limited (e.g., smaller turbines and those for offshore use).

  One of the issues associated with the larger turbines is their increased weight, which may has ramifications for construction (including difficulties in transporting such machines to a project site) and life-spans. Consequently, and also to investigate improvements in turbine efficiency, there is research into the use of lighter materials (e.g., carbon-fiber tips for blades) for turbines (Industry Canada 2007) as well as different rotor designs (US Department of Energy 2007). A lack of space at blade-testing facilities has been a problem, although there are new facilities under development in Massachusetts and Texas (US Department of Energy 2007).

  Ways of enhancing potential revenues from wind power projects are also being evaluated. For example, various investigations are underway to combine electricity generation from wind turbines with other technology, such as desalination plants (National Renewable Energy Laboratory 2008b) or the production of hydrogen. This latter effort is the subject of a demonstration project currently underway in Colorado (US Department of Energy 2007).

- **Reducing grid impact**. The fixed-speed nature of many turbines has led to issues with the grid connections. Variable-speed operation, now in limited use but also the subject of current study, offers better quality output to the grid (US Department of Energy 2008), particularly with larger (greater than 1 MW) turbines. Integration of such turbines with the grid is also being researched to improve project connection modeling and understanding (National Renewable Energy Laboratory 2008b).

- **Enhancing reliability**. Research regarding improvements in turbine reliability is focused on reducing operation and maintenance costs – which are particularly important for gearboxes (Industry Canada 2007) – and may be up to 40 percent of the total system cost (US Department of Energy 2007). Similar investigations are also underway into extending the working life of systems beyond their current roughly 25-year lifespan to as much as 50 years (US Department of Energy 2007).

- **Increasing efficiency**. Related to cost, but also intended to help expand the geographical area of their potential siting, research is underway to develop turbines that generate power more efficiently at lower speeds (National Renewable Energy Laboratory 2008a and US Department of Energy 2008). Specific areas of study include development of larger rotors that are cost-efficient; development of taller designs that can be assembled on-site; and increased efficiency in electricity generation equipment and turbine electronics (US Department of Energy 2008).

In sum, technological advances are increasing the cost-effectiveness of wind-generated electricity and increasing the geographical area where wind generation is economical. The pace of this research is difficult to determine, but with increasing competition in the market and increasing public policy focus on issues associated with the need for renewable sources of energy, the pace in gaining increased knowledge can be expected to quicken.

The prospects for improvements to wind technology discussed above have a number of implications for land use and environmental regulators and other policy makers. Much of the technology that is being pursued is intended to allow the development of wind energy in places where wind velocities are currently not high enough to be economic. In the future, more area in Maine could be suitable for wind power development than is currently the case. Other technological advances focus more on improving economic viability of projects through increased efficiency and reliability, which could also have the effect of increasing the number of proposals in Maine. If projects are proposed that combine technologies, it is foreseeable that these projects could pose new technical or regulatory issues. See the offshore discussion for potential ramifications of technology improvements with potential to affect offshore Maine.

Recommendations

❖ **Track technical advances in the wind energy industry with an eye toward potential regulatory and/or policy implications**

As discussed above, technological advances are expected to create new opportunities for wind energy development, which may in turn give rise to environmental, land use or economic issues of interest to the state. The Task Force recommends that the Governor's Office of Energy Independence and Security (OEIS), in consultation with the PUC, monitor developments in wind power technology, for use both on land and offshore, and through the

Energy Resources Council or other appropriate policy-level forums, coordinate with state agencies to ensure awareness of technological advances and timely identification of any state policy implications.

Lead agency: OEIS; ongoing

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Attachments

A. Executive Order from Governor John E. Baldacci

B. Wind Power Task Force Members

C. Other Participants

D. NREL Wind Resources Map

E. Summary of Sustainable Energy Advantage Wind Analysis

F. DEP Rules Chapter 315 (10)

G. Scenic Resources of State or National Significance

H. Guidelines for Wind Power Project Ecological Study Recommended by the Maine Department of Environmental Protection and Maine Department of Inland Fisheries and Wildlife

I. DEP Standards on Noise and Shadow Flicker at Wind Power Projects

J. The Benefits, the Quid Pro Quos for Fashioning a Streamlined Approach to Commercially Sized Wind Energy Facility Siting

K. Assessment of the Status of Offshore Wind Power Technology, Economic Viability and Future Outlook

L. Emission Benefits of Wind Power

M. Approach to Scenic Impacts

Attachment A. Executive Order from Governor John E. Baldacci

OFFICE OF
THE GOVERNOR

NO. 31 FY 06/07
DATE May 8, 2007

AN ORDER ESTABLISHING THE GOVERNOR'S TASK FORCE ON WIND POWER DEVELOPMENT IN MAINE

WHEREAS, Maine energy policy seeks to promote the development and use of renewable energy sources to help reduce Maine's dependence on imported fossil fuels, provide economic development, and promote security; and

WHEREAS, scientists have concluded that increases in greenhouse gas levels, including but not limited to carbon dioxide, are resulting in worldwide climate change; and

WHEREAS, wind power does not generate greenhouses gases and is broadly viewed as having fewer environmental impacts than other forms of electrical power generation; and

WHEREAS, wind power is the fastest growing utility-scale source of renewable energy in the world; and

WHEREAS, Maine has the highest wind potential of any New England state and ranks 19th in terms of wind potential in the United States as a whole; and

WHEREAS, wind power development can provide short term and long term economic and employment benefits for Maine citizens; and

WHEREAS, the State's wind resources occur in various areas of the State that may have important ecological, natural resource, remote resource, and other values that are important to Maine people that can lead to conflict regarding the siting of wind power facilities; and

WHEREAS, Maine could become a leader in New England in the development of wind power if a comprehensive approach is pursued that involves guidelines that direct wind power toward appropriate locations; well-designed and efficient regulations; the protection of areas where wind power is not appropriate; and collaboration among state agencies, wind power developers, interested parties, and the public.

NOW, THEREFORE, I, John E. Baldacci, Governor of the State of Maine, do hereby establish the Governor's Task Force on Wind Power Development in Maine.

Purpose and Duties

The purpose and duties of the Task Force shall be to:

1. Examine the regulatory process and review criteria by which wind power projects currently are evaluated in Maine, identify barriers to wind power development and compare Maine's policies with approaches used in other jurisdictions;

2. Identify and recommend any changes deemed beneficial for assuring that Maine has a balanced, efficient and appropriate regulatory framework for evaluating wind power projects. Changes might include, but are not limited to, updating statutory and regulatory review criteria, technology-specific wind power siting guidelines, opportunities for streamlined permitting for certain categories of wind power projects and the use of negotiated settlement tools for resolving conflicts;

3. Propose policy changes that would help facilitate the development of wind power in Maine and establish a lead agency for tracking wind power generated in Maine, monitoring technological advances in wind power generation and providing educational materials regarding wind power;

4. Examine and make appropriate recommendations regarding Federal, State and local programs and financing options available to assist in the development of wind power projects;

5. Identify a range of options, benefits and incentives that might be available to communities that are affected by wind power projects;

6. Create guidelines and related information that would assist wind power developers in identifying areas in the State of Maine that are more appropriate for wind power development, and avoiding areas that are not appropriate for wind power development, due to legal, natural resource or public value constraints; and

7. Propose goals for installed wind power in Maine for 2010 and 2020, provide an estimate of the economic and emission-reduction benefits of achieving such goals and suggest strategies to attain those goals.

To fulfill these duties, the Task Force shall collaborate and coordinate with the Land Use Regulation Commission, the Department of Marine Resources, the Department of Economic and Community Development, the Department of Agriculture, the Public Utilities Commission, the Office of the Governor, members of the Maine Legislature and other interested members of the public.

The establishment of this Task Force is not intended to delay or interfere with wind power projects that are already in the permitting process.

Membership

The Governor shall appoint 16 members to the Task Force. One member shall be the Commissioner of the Department of Conservation, or his designee; one member shall be the

Commissioner of the Department of Environmental Protection, or his designee; one member shall be the Director for the Office of Energy Independence and Security; one member shall be the Commissioner of the Department of Inland Fisheries and Wildlife, or his designee; and one member shall be the Director of the State Planning Office or her designee.

The remaining appointments shall include diverse members with relevant knowledge and experience in wind power development, land use and conservation policies and regulation, renewable energy policies, electricity and transmission policies and infrastructure, natural resource and remote recreation values, and environmental impacts from electrical power generation.

The President of the Senate may appoint two members of the Senate, and the Speaker of the House may appoint two members of the House of Representatives. Members shall serve at the pleasure of their appointing authority.

The Governor shall appoint the chair of the task force from among the members. The chair will schedule, set the agenda for, and preside at Task Force meetings.

Staff

Staff support to the Task Force will be provided by the Land Use Regulation Commission, the State Planning Office, Department of Environmental Protection, and other state agencies as needed. The members of the Task Force shall serve without compensation.

Report

The Task Force shall submit its recommendations to the Governor no later than January 15, 2008, after which the Task Force will dissolve.

Effective Date

The effective date of this Executive Order is May 8, 2007.

John Baldacci

John E. Baldacci, Governor

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Attachment B. Wind Power Task Force Members

R. Alec Giffen (Chair), Director, Maine Forest Service
Senator Phillip Bartlett
Juliet Browne, Verrill Dana LLP
Pete Didisheim, Director of Advocacy, Natural Resources Council of Maine
Judith A. Dorsey, Retired Lawyer
Representative Stacey Fitts
Senator Walter Gooley
Jody Jones, Wildlife Ecologist, Maine Audubon Society[13]
John Kerry, Director, Governor's Office of Energy Independence & Security
Kathleen Leyden, Coastal Program Manager, State Planning Office
David Littell, Commissioner, Dept. of Environmental Protection
Representative W. Bruce MacDonald
Milton McBreairty, Business Manager, IBEW Local Union 567
Patrick McGowan, Commissioner, Dept. of Conservation
Steve Timpano, Environmental Coordinator, Dept. of Inland Fisheries & Wildlife
David Wilby, Executive Director, Independent Energy Producers of Maine

[13] Dave Publicover of the Appalachian Mountain Club served as an alternate member.

Attachment C: Other Participants

(Note – This list is not complete)

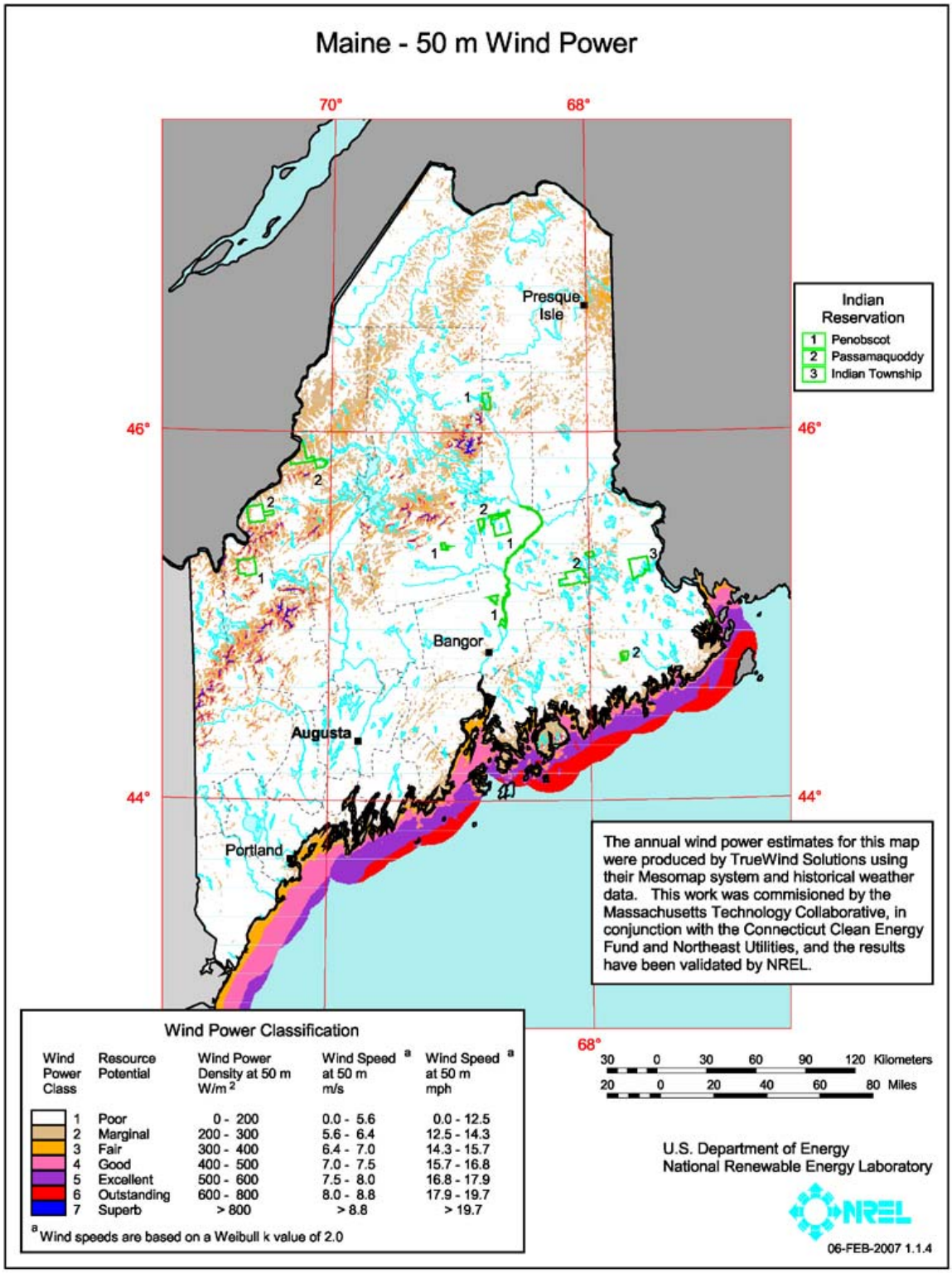
Kurt Adams, Chairman, Maine Public Utilities Commission (PUC)
Philip Ahrens, Pierce Atwood (representing wind power developers)
Daniel Alberts, Citizen
Thomas Austin, Maine Public Utilities Commission
George Baker, Professor, Harvard Business School
Richard Barringer, Research Professor, Muskie School of Public Service
Steve Bennett, Citizen
Terry Bennett, TransCanada Energy Ltd.
Todd Burrowes, Maine State Planning Office
John Carpenter, Citizen
Catherine Carroll, Executive Director, Land Use Regulation Commission
Howard Carter, Saco Wind Power Project
Jack Cashman, Governor Baldacci's staff
Steve Clark, Maine Appalachian Trail Club
Coke Coakley, Florida Power & Light
Josh D'Agnato, UPC Wind
Dick Davies, Public Advocates Office
Orlando E. Delogu, Emeritus Professor of Law, University of Maine School of Law
Terry DeWan, Consultant, Scenic Issues
Nick Di Domenico, TransCanada Energy Ltd.
Holly Dominie, Consultant, Scenic Issues
Frank Dunlap, Florida Power & Light
David Douglass, State Planning Office
Larry Flowers, National Renewable Energy Laboratory
Gore Flynn, Business Development and Finance Consultant
Rob Gardiner, Principal, Independence Wind, LLC
Sarah Giffen, Land Use Regulation Commission
Ann Gosline, Facilitator, Gosline & Reitman
Robert C. Grace, President, Sustainable Energy Advantage, LLC
Dudley Greeley, Citizen
Scott Hawken, Florida Power & Light
Chris Herter, Wind Developer
Bill Hopwood, Hopwood, Inc.
Jim Hutzler, Citizen
Dr. Richard Jennings, Citizen
Matthew Kearns, Director of Project Development, UPC Wind Management
James H. Keil, Stantec
John Kerry, Director, Governor's Office of Energy Independence & Security
Richard Kimball, Assistant Professor of Engineering, Maine Maritime Academy
Ron Kreisman, Environmental Attorney
Harley Lee; Endless Energy Corp.
Dr. Robert Lindyberg, P.E., Assistant Director for Boatbuilding and Marine Composites, The AEWC Center at the University of Maine

David Lovejoy, Deputy Superintendent, Mountain View Youth Development Center, Charleston Correctional Facility
Sean Mahoney, Conservation Law Foundation
Bill McGuinness, Island Institute
Sam Merrill, Assistant Research Professor of the Muskie School of Public Service and Director of the New England Environmental Finance Center
Bruce Munger, Citizen
Janet Parker, State Planning Office
Bob Proudman, Director of Conservation Operations, Appalachian Trail Conservancy
Nate Sandvig, Business Development, Noble Environmental Power
Suzanne Sayer, Environmental Geophysicist
Glenn Schleede, President Energy Market & Policy Analysis, Inc,
Joseph Seale, Citizen
Marcia Spencer-Famous, Land Use Regulation Commission
Patrick Strauch, Executive Director, Maine Forest Products Council
Mitchell Tannenbaum, Attorney, Maine Public Utilities Commission
Jeff Thaler, Environmental and Natural Resources Attorney, Bernstein & Shur
Karin Tilberg, Governor Baldacci's staff
Fred Todd, Manager, Planning and Administration, Land Use Regulation Commission
Dain Trafton, Citizen
Wendy Todd, Mars Hill Resident
Dylan Voorhees, Natural Resources Council of Maine
Bob Weingarten, Spokesman, Friends of the Boundary Mountains
Al Wiley, Florida Power & Light
John Zimmerman, President, Vermont Environmental Research Associates, Inc.

Subcommittee on Community Wind

Representative Bruce MacDonald—Co-chair
Representative Stacey Fitts—Co-chair
Steve Bennett, Freedom
Suzanne Sayer, Kittery
Bill McGuinness, Island Institute
John Carpenter, citizen
Dr. Richard Jennings, citizen

Attachment D. Maine Wind Resources Map



Source: U.S. Department of Energy, National Renewable Energy Laboratory (2007).

Attachment E. Summary of Sustainable Energy Advantage Wind Analysis

To help the Governor's Wind Power Task Force analyze the need for wind energy and Maine's wind power potential in a regional context of energy economics and climate protection goals, a consultant team consisting of Sustainable Energy Advantage, LaCapra Associates and AWS Truewind was retained by the Natural Resources Council of Maine, Conservation Law Foundation, Union of Concerned Scientists, and Environmental Defense, with additional support from the Kendall Foundation. Bob Grace of Sustainable Energy Advantage was the lead consultant. A short description of the analysis is provided below. The organizations involved in the project will release a more detailed report in Spring 2008.

The purpose of this analysis was to answer three important questions:

1) How much renewable energy, including wind power, does the region need to meet existing policy objectives—including RPS, RGGI and the climate protection goals established by the New England Governors (38 MRSA §576)?
2) What is the realistic potential for wind power development in Maine and the other New England states?
3) Given energy market conditions today and going forward a decade, what is the most economic way to achieve our renewable energy and wind power needs within the region, and what does this imply for the distribution of generation development in Maine and throughout the region?

In brief, the analysis determined that the region will need to develop at least 10,000 MW of wind power by 2020 in order to produce enough clean, indigenous energy to meet our environmental and economic policies. If Maine and the region are unable to utilize energy efficiency aggressively, the need may be around 15,000 MW. The region has more than 9,000 MW of developable onshore wind power potential—possibly as much as 18,000 MW if emerging wind projects can economically harness very low-wind areas. Between 55 to 80 percent of that potential is located in Maine. In addition the region may have approximately 8,000 MW of shallow water offshore wind resources that could potentially be developed in the next decade, the majority located in the waters off Massachusetts. However, based on what is known today of offshore wind economics and the state of technological development for this relatively immature application of wind power technology, it is unclear whether much of this low-wind or offshore potential will be economically competitive or feasible. The supply and demand model used by the consultants presented a range of scenarios for determining the most economic amount and location of wind power regionally. Those results for Maine ranged from 4,000 MW to over 10,000 MW.

Estimating our Renewable Energy Needs

Existing policies in Maine and other New England states require an increase in renewable power production. Formal Renewable Portfolio Standard laws in place in all New England states except Vermont, have explicit requirements for an increasing percentage of renewable power. In addition, the Regional Greenhouse Gas Initiative (RGGI), which comes into effect in 2009, will require the participating states to meet their electricity needs within a fixed and eventually declining carbon budget—which will require an increase in low- or zero-carbon generation.

Beyond existing laws and regulations, our need for renewable energy is also driven by our overall greenhouse gas reduction goals. In 2001, Maine and the other New England states and Eastern Canadian provinces adopted a Climate Action Plan with specific emission reduction goals. In 2004, these goals were enacted into Maine law (38 MRSA §576). For the purposes of this analysis, the law identifies the 2020 goal as reducing emissions to 10 percent below 1990 levels. According to the latest available data, this means a reduction of 38 million tons of carbon dioxide regionally.

Exactly how much renewable energy these future policies will require depends on our overall electricity demand and our ability to reduce carbon emissions from non-electric sources. The team evaluated two electricity demand scenarios, a "high growth" scenario used by the New England Power Pool, and a "low growth" scenario which would reflect demand if the region achieved nearly all the available cost-effective energy efficiency measures. Consistent with existing state and federal carbon mitigation studies, the final analysis assumed that 45 percent of our carbon reductions could occur from transportation, forestry and other sectors.

The results indicate that by 2020 the region will need approximately 37,000 gigawatt-hours (GWh) of renewable energy per year under the low growth scenario and approximately 53,000 GWh under the high growth scenario.[14] (For reference, electricity sales in Maine are currently around 13,000 GWh per year.) Wind power is not the only renewable source available to meet this need—the extent to which wind power in each state could meet that need is described below.

New England's Wind Power Potential

Maine's wind power potential has been estimated several times over the years based on wind resource modeling and other relevant features, such as proximity to transmission lines.[15] This analysis conducted and presented to the Task Force represents the most sophisticated evaluation to date. It is based on wind speed modeling at turbine hub heights of 260 ft (80 m), which more accurately reflects current and near-term wind turbine technology than previous modeling data. The raw wind potential was then filtered twice. First, the analysis excluded several categories of land usage where wind power will be infeasible or categorically undesirable—for example state parks, very steep slopes, lakes or wildlife refuges. Second, it discounted the availability of different land types according to estimates of the amount of land that might "reasonably" be available. For example this ranged from discounting, or removing from consideration, 100 percent of the land within two miles of the Appalachian Trail, 85 percent of National Forest Land, 50 percent of forest land and 0 percent of agricultural land. These reductions did not reflect the specific positions of the Task Force nor the sponsoring organizations but reflected a starting point in recognizing that not all windy lands could or would be developed. In Maine, this left 1,966 km^2 (685,000 acres) of developable land. The resulting onshore megawatt potential, sorted by state and wind Power Range[16], with Power Range 5 the windiest and most scarce, are shown in the following table.

[14] The range of uncertainty is about 3000 GWh and reflects different amounts of energy imports. The 2015 amounts are approximately 23,000 GWh to 27,000 GWh respectively, plus or minus 2000 GWh.

[15] For example, *Report on the Viability of Wind Power Development in Maine*, Maine Public Utilities Committee (Presented to the Utilities and Energy Committee of the Maine Legislature, January 27, 2005.)

[16] Power Range is based on the wind power in watts per square meter; this measure is distinct from, but related, to Wind Class (which is defined at a lower hub height).

	Power Range					State Total
	1	**2**	**3**	**4**	**5**	**(MW)**
Maine	3,811	825	359	160	165	**5,320**
Vermont	919	605	262	97	64	**1,947**
New Hampshire	721	288	116	46	53	**1,224**
Massachusetts	539	271	75	13	3	**901**
Connecticut	25	-	-	-	-	**25**
Rhode Island	-	-	-	-	-	**-**
Total						**9,417**

In response to feedback from the Task Force and others, the team evaluated the potential from an even lower class of wind (referred to as Power Range "0"). Power Range "0" represents winds at speeds below which have previously been considered economically feasible for commercial-scale wind power development. The economic feasibility of this wind resource remains relatively untested, however the amount of land in this category is very extensive, particularly in Maine. The consultant team estimated that as much as 9,300 MW of additional potential might theoretically be available from these areas in Maine over the next decade. However, it is important to note that to generate the same amount of energy as wind generators in areas considered commercially viable for wind development, approximately 50 percent more turbines would be required.

The offshore wind potential was evaluated by estimating wind potential in shallow water (<50 ft) within 20 miles of land, using existing national wind resource modeling and discounted based on existing estimates of the amount of area reasonably available. This resulted in approximately 1,200 MW of offshore potential off of Maine, 430 MW off of Rhode Island, and 6,500 MW off of Massachusetts, for a total of about 8,000 MW.

Results of the Final Economic Analysis

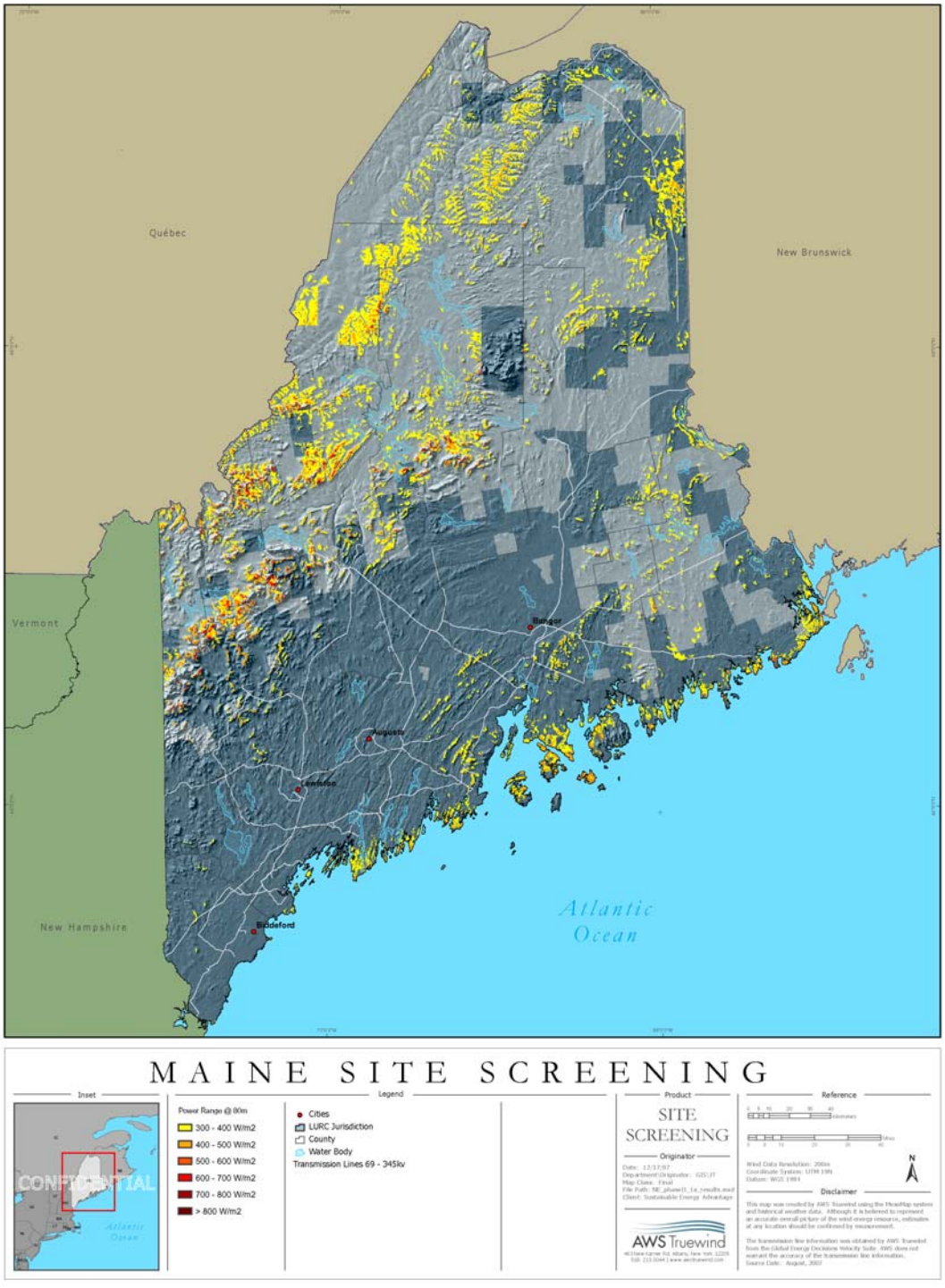
In order to ground the analysis in an economic reality, the team prepared a renewable energy supply and demand model with many inputs. A variety of assumptions were used in this model, based on the best information available today and a broad set of empirical data. The final model included aggressive development of emerging renewable energy technologies, including tidal and solar (nearly 1,000 MW by 2020), as well as continued increases in wind power technology and capacity factors. Biomass, hydropower and landfill gas potential were also considered. The projected resource build out was predicated on the relative economics of each resource type and its resource potential.

The results indicate a range of scenarios for meeting the needed amount of additional renewable energy as economically as possible. In all cases biomass, landfill gas and hydropower played a very small role in meeting this need because the other resources have more limited resource potential than wind and because wind power, even in more expensive areas, was more cost-effective. With a high growth electricity demand, approximately 15,500 MW of wind power will be required to meet the 53,000 gigawatt-hours of renewable power described above, plus approximately 1,000 MW of biomass, hydro/tidal and solar. Under a low growth demand, the amount of wind power needed would drop to approximately 11,000 MW.

The results of the economic model also indicated possible development patterns by state. The results differed considerably based on assumptions about the economic feasibility of the low-wind areas in Maine. These low-wind areas are very large but their economic viability is uncertain. At one extreme, where these areas are considered economically unviable, approximately 4,000 MW of onshore wind in Maine would be called on, plus nearly 4,500 MW in the rest of New England, plus 4,000 to 7,000 MW of offshore wind (with 300 to 350 in Maine). In another scenario in which large amounts of lower-wind areas in Maine are assumed economically viable, 7,700 to 12,000 MW of onshore wind in Maine would be called on, plus approximately 4,000 MW of onshore wind in the rest of New England. A number of factors, including grid structural limits, make this result unlikely. The 4,000 MW scenario is more feasible and represents a sound pathway to meeting the region's renewable power objectives in an economically efficient way.

Wind Resource Map

The attached map depicts onshore areas in Maine that appear to have sufficiently strong wind velocities to support economically viable wind power projects during the timeframe defined by the Bob Grace analysis, through 2020. Lower wind areas are indicated in yellow, and higher wind velocities are shown in red. The map shows potential wind resource areas that remain after the landscape exclusions mentioned above have been applied. This map is based on modeling by AWS Truewind. Actual wind velocities may differ, based on field data gathered by a developer.



This map provides a modeling of areas where wind power projects may be economically viable in Maine, based on assumptions used in the Bob Grace analysis. Parks, conservation lands, and other landscape exclusions have been screened out. Projects in lowest power range (yellow) have not been proven in Maine, yet changes in technology and energy costs suggest that wind projects may become viable in these areas through 2020.

Attachment F. DEP Rules Chapter 315 (10)

Chapter 315 (10) – Scenic resources. The following public natural resources and public lands are usually visited by the general public, in part with the purpose of enjoying their visual quality. Under this rule, the Department considers a scenic resource as the typical point from which an activity in, on, over, or adjacent to a protected natural resource is viewed. This list of scenic resources includes, but is not limited to, locations of national, state, or local scenic significance. A scenic resource visited by large numbers who come from across the country or state is generally considered to have national or statewide significance. A scenic resource visited primarily by people of local origin is generally of local significance. Unvisited places either have no designated significance or are "no trespass" places. Sources for information regarding specific scenic resources are found as part of DEP's Visual Evaluation Field Survey Checklist (doc. #DEPLW0540) provided in the application.

A. National Natural Landmarks and other outstanding natural and cultural features (e.g., Orono Bog, Meddybemps Heath);

B. State or National Wildlife Refuges, Sanctuaries, or Preserves and State Game Refuges (e.g., Rachael Carson Salt Pond Preserve in Bristol, Petit Manan National Wildlife Refuge, the Wells National Estuarine Research Reserve);

C. A state or federally designated trail (e.g., the Appalachian Trail, East Coast Greenway);

D. A property on or eligible for inclusion in the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended (e.g., the Rockland Breakwater Light, Fort Knox);

E. National or State Parks (e.g., Acadia National Park, Sebago Lakes State Park);

F. Public natural resources or public lands visited by the general public, in part for the use, observation, enjoyment and appreciation of natural or cultural visual qualities (e.g., great ponds, the Atlantic Ocean).

Attachment G. Scenic Resources of State or National Significance

Under the approach proposed by the Task Force, scenic impact of wind turbines would be evaluated when turbines would be visible from viewpoints in resources listed in Chapter 315 (10) A through E, (which are resources of state and national significance).

A. National natural landmarks, federally designated wilderness areas, and other outstanding natural and cultural features (e.g., Orono Bog, Meddybemps Heath);

B. A state or federally designated backcountry trail (e.g., the Appalachian Trail);

C. A property on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended (e.g., the Rockland Breakwater Light, Fort Knox);

D. National or state parks (e.g., Acadia National Park, Sebago Lakes State Park);

E. Scenic impact of wind turbines would be evaluated for a subset of resources set out in Section F that are resources of state or national significance, specifically:

   1. Lakes and ponds previously identified as having highly significant scenic value (specifically, 66 lakes in the organized townships identifies in the "Maine's Finest Lakes" study, and 280 lakes and ponds in LURC jurisdiction designated as "outstanding" or "significant" from a scenic perspective in the Wildlands Lakes Assessment);

   2. Segments of rivers identified as having scenic significance in the Maine Rivers Study;

   3. A subset of Public Reserved Lands: DOC, in cooperation with DEP and LURC, will determine viewpoints on the state's public reserved lands that are of state or national significance from a scenic perspective, using criteria set out in Chapter 315, (e.g., significance of resources and number of people who visit from around the state or nation). This could be done prospectively, or on a case-by-case basis;

   4. Scenic turnouts on the state's designated scenic highways;

   5. Scenic points of state and national significance in Maine's coastal zone, as identified in *A Proposed Method for Coastal Scenic Landscape Assessment with Field Results for Kittery to Scarborough and Cape Elizabeth to South Thomaston,* Dominie et al, October 1987; *Scenic Inventory Maineland Sites of Penobscot Bay*, Dewan and Associates, et al, August 1990; and *Scenic Inventory Islesboro, Vinalhaven, North Haven and Associated Offshore Islands,* Dewan and Associates, June 1992 or other inventories conducted using a similar methodology approved of by the Maine State Planning Office.

Attachment H. Guidelines for Wind Power Project Ecological Study by the Maine Department of Environmental Protection and Maine Department of Inland Fisheries and Wildlife

February 1, 2008

These guidelines are intended to assist wind power developers in Maine and supplement existing Maine statutes and rules developed under the Site Location of Development Law and Natural Resources Protection Act for ecological impact and are focused on assessing potential avian and bat impacts from large scale wind power development in Maine.

- Initial site screening: Initial siting requirements should include screening for bird, bat and wildlife habitat using known data. For initial siting applicants should screen known data on bird, bat, wildlife in the general area of the development and on the specific project site (consulting DIF&W Essential Habitat maps, consult with USFWS on endangered and threatened species, review *Beginning with Habitat Maps,* DIF&W/DEP database of significant wildlife habitat, state database for G1, G2, S1, S2, and S3 imperiled communities). While required for application submittal, screening information should be shared early on in the siting process with DEP, DIF&W, Maine Natural Areas Program, and DMR staff to gather feedback for the applicants and aid in the determination of where to focus additional investigations for final application submittal. Early consultation based on screening information is crucial to determine study needs to study designs.

- Pre-construction study requirements: The Department and review agencies will generally require the submittal of at least two migratory seasons, spring and fall, of bird/bat nocturnal radar, diurnal surveys for migratory birds and raptors, and acoustic studies for bats. If high value resources or habitats are present (e.g. eagle nest, high raptor use, migration corridor, endangered or threatened species), scoping and additional study will be required.

- Methodology for bird and bat pre-construction studies: Bird and bat studies should follow the *Methodologies for Evaluating Bird and Bat Interactions with Wind Turbines in Maine,* including Appendices I-IV, compiled by Maine Audubon based on work of the Maine Windpower Advisory Group, DIF&W, and Wildlife Windpower Siting committee (draft April 12, 2006). When methodologies will vary from specific recommendations in this *Methodologies* document, applicants should consult with DEP and DIF&W.

- Seasonal surveillance period: In most cases, radar studies should be done of at least one fall and one spring migration with at least 20-30 nights each season, representing various seasonal weather fronts. *See Methodologies* at p. 4.

- Combination of approaches advisable:[17] Preconstruction bird and bat studies by multiple methods: nocturnal bird/bat nocturnal radar,[18] diurnal surveys for migratory birds and raptors, acoustic studies for bats, and other studies should be conducted for a minimum of two migratory seasons in the site area. If high use by bird/bats or high-value habitat or species are identified, four migratory seasons may be necessary. Particular attention should be paid to identification of site characteristics that may attract birds/bats such as thermals, forested ridge lines, saddles, etc.

- Lighting: Site design should consider limiting lighting of related maintenance buildings, power stations, etc. equipment that may attract birds in bad weather and insects (therefore bats) at night. Lighting on the towers themselves should consider research on attraction of birds (bats shown not to be attracted to red F.A.A. lighting). *See* NRC at p. 86 and p. 321.

- Post-construction bird and bat mortality: Mortality studies for birds and bats should be conducted for a 2-3 year period (i.e. 2-3 spring and 2-3 fall migration seasons) within 5 years of start of operation. These studies should follow the *Methodologies* recommended for post-construction review and consult with DEP/IF&W when an applicant desires to vary from recommended methodologies.

- Post-construction study plan: The post construction study plan should be co-related to pre-construction study design to provide robust data on environmental impacts that are comparable between the pre and post construction condition.. For example, before-after/control impact (BACI) design is useful for impact study design. *See* NRC pp. 280-83.

- Use of thermal imagery: While relatively new, use of thermal imagery has been documented to be valuable when compared with radar data on birds, bat and insect activity in windpower areas. *See NRC p 329*. Initial application of thermal imaging at a few sites is encouraging: when used with long-range imagery capability has been found capable of detecting 100% of the small passerine (song bird) passage within 3000 meters of the unit. *See NRC p 332*. When combined with height information (presumably from radar), thermal imagery is the only sensing instrument found to be "excellent" by the National Research Council for detection, tracking and quantification of bird and bat passage. *See NRC, Table C-2 pp. 286-87, see also NRC pp. 331-336.* If initial screening or initial studies indicate significant concern with potential wind facility rotor interaction with bird/bats species in the projection area or a potential migration corridor, or other

[17] The National Research Council's review of observational/monitoring methods found that: "In many cases, using a combination of approaches will be of value as no single method can be used for unambiguously assessing natural populations or the effects of wind turbines on biotic communities. Each approach has its own strengths, limitations, and biases. Investigators should understand the limitations, applicability, and operational considerations of each method before deploying them in the field. Local field guides and taxonomic keys for species identification are essential tools for investigators . . . " *Environmental Impacts of Wind-Energy Projects*, National Research Council of the National Academies (2007) at p. 285.

[18] In addition to the *Methodologies* document commending use of both X-band radar pointed vertically and S-band radar pointed horizontally, note that the National Research Council concludes that marine radar should have a transmitter power as high as possible (25kW or greater). *See Methodologies* at p. 3 and NRC at p. 317.

specific concerns, use of thermal imagery provide another technology to confirmation migration passage rates and bat activity in vicinity of turbines..If significant mortality occurs at a site despite the best pre-construction review, thermal imagery may be used for post-construction investigation of bird/bat interaction with windpower facilities.

- Mortality species identification: If post-construction studies indicate substantial bird/bat mortality, identification of the species present in the area surrounding a windpower project is essential to assess facility impacts. For carcasses and partial remains, specific identification may require bird feather or bat hair samples. *See* NRC pp 338-39. Mitochondrial and DNA markers can determine sources populations of birds/bats that move long distances and identify geographic origin of bats and birds killed at wind-energy facilities.. NRC p. 338. Bat hair and bird feather samples are maintained in national repositories (American Museum of Natural History for birds/bats tissues collected below wind turbines and Conservation Genetics Research Center at UCLA for feathers samples for genetic analysis) and when conditions specifying use of repositories for samples may be appropriate in certain circumstances. *See* NRC at 291.

- Maine studies: Studies conducted for projects in Maine will provide valuable data nationally for windpower development in forested ecosystems. Because much existing research on bird and bat population impacts has occurred in desert, prairie, or open agricultural landscapes, research being conducted for Maine projects will contribute to scientific understanding of questions on which limited research data exists. *See NRC* pp. 132-38 on information needs and research recommendations.

Attachment I. DEP Standards on Noise and Shadow Flicker at Wind Power Projects

January 10, 2008
To: David Littell, Commissioner
From: Andrew Fisk, Bureau Director, Land & Water Quality
Re: DEP standards on noise and shadow flicker at windpower projects

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Noise standards

The Department has extensive experience with its noise regulations (06-096 CMR, Chapter 375) which are administered under the provisions of the Site Location of Development Act. These rules have been in place since 1979 and have been applied to hundreds of different types of projects around the state. These rules were developed to consider a wide range of activities that generate different types of noise in different settings. The rules were consciously designed to consider many different types of developments, rather than be particular to any one type of noise or development. That said, there are rules and ordinances that have been developed for particular types of projects, including wind power projects.

Following the issuance of the Site Location permit for the Mars Hill windpower project, which required the submission of detailed predevelopment wind studies, the Department worked with the owners of the facility to scope and then review a post-development noise study. This monitoring work began in spring 2007 and is continuing through the winter of 2008. The results of this ongoing assessment of the noise generated by the project have been reviewed by the Department as well as a consultant hired by the Department to peer review the work of the applicant's consultant.

As a result of the consultant's assessment of other existing noise rules developed for windpower projects; the Department's experience with its own noise regulations; and the peer review of both pre- and post-development noise studies at the Mars Hill site, the Department has developed a number of specific conclusions and recommendations regarding the applicability of the noise rules to wind power projects.

Shadow flicker

There has been some comment provided to the Department that wind turbines have caused impacts on private residences from shadow flicker when sun shines behind an operating turbine. Maine's northern latitude may make wind power projects susceptible to causing irritating shadow flicker as a result of low altitude sun during certain times of year. Shadow flicker is described as "moving shadow on the ground resulting in alternating changes in light intensity" and has been noted to cause concern in Northern Europe (NRC 2007). The NRC report notes that there is available modeling software that allows for shadow flicker to be assessed and mitigated in the layout and design of windpower projects that are near developed areas.

Conclusions & recommendations

- Except for one clarifying change outlined below, the existing statute and rules are sufficient to allow the Department to regulate the noise effects of wind power turbines. DEP's noise rules conform with the stated best practices of the National Research Council's 2007 report on the "Environmental Impacts of Wind-Energy Projects."
- Revise Chapter 375.10 (E) to provide the Commissioner with the authority to "establish any reasonable requirement to ensure that the developer has made adequate provision for the control of noise . . ." Present language limits that authority to the Board of Environmental Protection (BEP) only.
- Noise generated from wind turbines does have attributes that warrant particular focus in the review of projects, including the low-frequency modulating noises generated as turbine blades pass by towers.
- Analysis of ambient noise generated by wind must be carefully evaluated with specific equipment in pre-development and post-development monitoring so that it is not considered a component of noise generated by a wind turbine.
- Post-monitoring studies require careful placement of monitors that account for the effects of topography, prevailing wind (at both ground and turbine levels).
- Post-monitoring studies must be conducted during operational conditions that generate the most noise and during seasons or times when sound propagation is likeliest (such as wintertime snow cover).
- Variances from the existing noise regulations should only be granted in the circumstances set forth in the applicable section of the DEP regulations, where particular attention must be focused on precisely determining the characteristics of ambient noise.
- LURC should adopt parallel rules to those of the DEP to provide more detailed guidance than LURC rules currently provide and to make standards consistent statewide.
- To ensure that shadow flicker is not an adverse impact on protected locations, applicants for windpower projects in either LURC or DEP jurisdiction should demonstrate where shadow falls will occur and to what extent shadow flicker will result. Shadow flicker should be considered in the design of any project and minimized to the extent practicable. There is sufficient statutory authority in DEP and LURC law to request and review this information.

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Attachment J. The Benefits, the Quid Pro Quos for Fashioning a Streamlined Approach to Commercially Sized Wind Energy Facility Siting[19]

Orlando E. Delogu, Emeritus Professor of Law, University of Maine School of Law
January, 2008

In response to the call for a streamlined approach to commercially sized wind energy facility (and necessary transmission line) siting some have asked– why should Maine bear the burden of these large, noisy and arguably unsightly facilities, what's in it for Maine citizens? That's a fair question; it's not enough to simply say because we can, because we have the wind resource. That seems too altruistic, perhaps even a little gullible. Moreover, there are far more compelling reasons– sound, hard-headed economic, employment, and public policy reasons that taken together constitute a meaningful array of benefits– the quid pro quos for accepting 25-40 (perhaps more) commercially sized wind energy facilities over the next 3-5-7-10 years.[20] An enumeration of this array of benefits follows.

1. First, each of the facilities proposed to date in Maine represents a significant level of new capital investment. The amount proposed to be invested for each facility varies with the size of the facility, site differences and differing transmission line needs, but the range to date is between $95-270 million dollars.[21] Though some of this capital investment will move out of state to buy materials and equipment not presently available or made in Maine, a good bit of the invested capital (including the physical facilities and the transmission lines needed to move the energy produced onto the grid) are, and will remain, in Maine. This investment will enhance state and local tax bases,[22] create jobs, and have beneficial ripple and multiplier effects on Maine's economy far into the future. Finally, if one expands the numbers cited above (see f.n's 21 and 22) from the 5 facilities (that have been or are being contemplated) to the realistically possible level of 25 (or more) such facilities, we can see that this energy source, this industry, has the capacity to infuse somewhere between $2-3 billion dollars of new capital investment into Maine economy. By historic standards these are staggering numbers, but at the same time this is

[19] A version of this paper was presented to Governor Baldacci's Wind Energy Task Force in November, 2007.

[20] This would almost certainly generate between 2,000-3,000 MW of electricity. To understand what this means in more practical terms it seems useful to know that 100 MW of energy output would meet the energy needs of between 30,000-35,000 average size households. Using the mid-points of this date, 2,000-3,000 MW of electricity would thus meet the energy needs of 812,000 households. According to US census data there are presently approximately 550,000 households in Maine.

[21] A rule of thumb in the industry is that each MW of wind energy output requires a capital investment of approximately $2 million dollars. The five facilities that have recently been discussed in Maine, for example, range from $95 million dollars of investment for the 42 MW. Mars Hill facility (now on-line); to $130 million dollars of investment for the 90 MW Redington facility (declined by LURC); to $110 million dollars of investment for the scaled back version of Redington, the 54 MW Black Nubble facility (awaiting LURC disposition); to $100 million dollars of investment for the 57 MW Stetson project (recently approved by LURC); and finally, $270 million dollars of investment for the proposed 132 MW Kibby wind power project.

[22] The Mars Hill facility, for example, is committed to a property tax payment of $500,000 dollars annually for the next 20 years, a total of $10 million dollars. This has provided a meaningful level of tax relief to every other property taxpayer in the town.

a level of investment that is clearly within reach– **Maine has the critically necessary wind resource.**[23]

2. Second, the cryptic reference to jobs in the preceding paragraph requires expansion. Wind energy development along the lines suggested above will give rise to two types of employment– both are important. To begin with, each facility will create a range of direct (and mostly short-run) employment opportunities. Site selection, facility design, engineering, the permitting process, site improvement, and actual construction will all require personnel (many of whom will be highly trained and highly paid professionals) for varying lengths of time. And, though employment levels at any one facility will drop once the facility comes on-line, there will then be a base level of permanent employees trained to operate, maintain, and monitor operations. These jobs too will require well-trained, and commensurately well-paid people.[24] **Of equal or greater importance is the fact that many of these jobs will be located in northern Maine, an area of the state where unemployment, and wage levels have been a constant problem.**

The second (more indirect) type of wind energy related employment involves the design, fabrication, assembly, and maintenance of the equipment utilized by wind energy facilities. Almost everything from towers, to blades, turbines, electronic controls, etc., now comes from out of state suppliers– this outflow of capital investment and jobs to other states, Canada, and Europe must change. It robs Maine of the full economic potential which the capital investment in wind energy facilities is capable of creating. The employment potential here is huge. But It can only be realized if we in fact develop a real wind energy industry in the state – only if we move from one on-line facility to 3, 5, 10, 25+ such facilities– only if this scaled-up level of activity has projects which are at every stage of development, i.e., the permitting phase, actual construction, and on-line operation. This reality will give rise to a totally different mind-set among suppliers of wind energy equipment and component materials. They will no longer be content to ship bulky and delicate equipment into Maine– they will reduce costs and improve service by operating in Maine, in close proximity to an industry that has both critical mass and continuing growth potential. The growth in wind energy facilities in Texas (see f.n. 26) is directly on-point. A recent AP report noted that:

> "Texas wants to be home to more than just the place with the most wind energy generation capacity... [Texas wants to be] an industry hub... the place where the industry grows, where companies manufacture and assemble wind turbines.... If you had a pipeline of several years worth of projects, manufacturers would set up plants here .... Then you would be supporting a manufacturing base for turbine [and all other wind energy] equipment, not just power generation."[25]

[23]It is worth noting that Texas (another state with extensive wind energy capacity) grew its wind energy output from 180 MW in 1999 to 3350 MW in 2007; another 1250 MW of output are under actual construction and will come on-line in 2008.

[24]Published data provided by UPC Wind, the developers of the Mars Hill facility, indicate that during the construction phase of their project over 300 Maine people (drawn from a variety of disciplines and firms) were employed; and their permanent in-state employment group now numbers 13; this, from a single 42 MW facility. Extrapolating to 25+ facilities and 2,000-3,000 MW of output, one sees that the direct employment potential is significant.

[25]Steve Quinn, AP, "Texas Tops in Wind Energy Production." USA Today, July 25, 2006.

This is precisely what we want for Maine– to be an industry hub serving in-state and regional (New England and Eastern Canada) wind energy equipment needs– with all of the employment potential that status portends. Here too, the jobs created will be mostly skilled and high-paying. **And again, this employment will be located primarily in northern Maine providing the economic boost this region needs.** But we must realize that these benefits are possible only if we steal a march on neighboring states– only if we enable this industry to take-off. The creation in Maine of a streamlined approach to wind energy facility siting is a critical step moving us in this direction.

3. Beyond the growth in tax base and jobs that an expanded number of wind energy facilities will create, there is a third type of benefit, i.e., the creation of permanent high-value conservation (open space) easements on land owned by the wind energy developer[26] as part of the exchange that identifies and ultimately permits a wind facility to be placed on suitable (from a wind energy standpoint) but less scenic land areas. This fashioning of a trade-off– of a win/win scenario between wind energy developers and the public sector may not be possible in every wind energy development setting. But the possibility should be examined during the permitting phase of each facility that presents itself for siting approval.[27]

4. A fourth type of benefit that 2,000-3,000 MW, or more, of wind energy (25+ facilities) will almost certainly create has two facets– the first is sometimes referred to as "energy security"– a stability of supply because these facilities are rooted in Maine, and the wind resource will not go away. The second, is some reduction in the cost of instate electrical energy. Will this drop in energy costs be significant– probably not. Will it be felt everywhere in the state– again, probably not. But Maine today has one of the highest electrical energy costs of any state in the nation– any downward movement (or even the stabilization of electrical energy costs) is a benefit, a step in the right direction. Published data from the federal government's Energy Information Administration clearly shows that states that produce a significant quantity of electrical energy, whatever the source– hydroelectric in TVA or pacific northwest states– coal and oil burning in mid-west, mid-Atlantic, and gulf coast states, and most recently wind energy in Texas, enjoy lower electrical energy costs across the spectrum of users– residential, commercial, and industrial than do non-electricity generating states.[28]

5. Finally, the long-term environmental benefits in Maine that 2,000-3,000 MW of wind energy (25+ facilities) would give rise to are very real. Our dependence on fossil fuels for energy production (with all of the air emission problems associated with these fuels) would be reduced;

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[26] For example, LURC's understandable (laudable even) effort to bar by regulation any and all development at elevations above 2,700 feet is a strategy that is legally questionable at best, and impermissible at worst. In many settings non-development at these higher elevations may be more permissibly achieved if it grows out of a voluntary agreement between the state agency (LURC) and a wind energy facility developer/landowner.

[27] This is the approach being taken by Plum Creek in its development application (currently before LURC) which requests (a rezoning and approval) of a significant level of residential and recreational development in defined areas, while at the same time subjecting other (much larger areas) to permanent conservation easements which preclude almost all future non-woods related development. The opportunity here (as in wind energy development settings) for mutually beneficial public/private trade-offs seems obvious.

[28] See Energy Information Administration, Average Retail Price of Electricity by State, July, 2007.

carbon emissions in particular would be reduced;[29] the seemingly relentless pace of global warming would be slowed; and most importantly, given Maine citizen's attitude towards nuclear power, we realistically position ourselves to fend off louder and louder demands (globally, in the nation, and ultimately in Maine) for a resumption of nuclear energy development/production. As global warming progresses, these demands will be harder to resist unless we are prepared to put an alternative (non-fossil fuel) energy source online. Wind energy is such an alternative.

Conclusion:

Our wind resources are real; they have extraordinary potential. The question before us is– do we have the political will to exploit this potential, to create a real wind energy industry (25+ facilities– 2,000-3,000 MW) in Maine. The range of benefits outlined above would seem to provide ample motive for moving in this direction. However, we seem to have difficulty getting out of our own way. Continuing to debate the technical efficacy of, and/or the environmental benefits of wind energy (which seem huge when compared with further reliance on fossil fuels for energy), coupled with our fragmented approach to wind energy facility siting, will almost certainly leave the promise of this industry largely unfulfilled. Alternatively, the creation of a more coordinated, a streamlined approach to wind energy facility siting is calculated to enable the promise of this industry to emerge. These streamlining steps (if taken) will, over time, encourage private sector energy developers to channel essential capital investment dollars into Maine– the rest will follow in due course– direct and indirect employment opportunities, public-private (conservation oriented) development agreements, a stability of energy supply, lowered energy costs, environmental benefits. Texas' experience suggests that this scenario is realistic. Maine is poised to do likewise– the time to act is **NOW**.

[29]Based on national carbon reduction data arising from presently online wind energy facilities, wind energy development in Maine along the lines projected in this paper would enable some 3.4 million tons of carbon emissions to be avoided annually.

Attachment K: Assessment of the Status of Offshore Wind Power Technology, Economic Viability and Future Outlook

To date, no wind energy projects have been proposed for waters off the coast of Maine. Wind energy facilities are operating in Europe and are being pursued offshore in other places in the United States. Germany, Denmark, the Netherlands, Great Britain, Ireland, and Sweden collectively generate approximately 900 MW of wind-produced electricity through offshore installations (Musial 2007), many of which are government-sponsored demonstration projects (Applied Technology and Management, Inc., et al. 2007). There are several offshore wind energy development proposals under review in the United States. The Cape Wind project off Massachusetts is a well-known proposed project that remains under active consideration. Other projects are under consideration are off the coasts of Delaware, New York, and Texas.

There are a number of areas where technological advances are being pursued to increase the practicality (and economic viability) of siting wind turbines in deeper waters. Issues being studied include those related to: construction, development of different foundations to support turbines, transmission, and operations and maintenance costs. Each of these topics is discussed below.

The water depth issue is important from a construction standpoint because of construction feasibility and increased cost as depth increases. To date, offshore wind turbine construction has generally involved the use of monopiles driven into the bottom or gravity-foundation designs—foundations weighted at the bottom to provide stability (Massachusetts Technology Collaborative et al. 2005). For monopiles, in general the deeper the water depth, the deeper the foundation must extend to ensure stability of the turbine against wind, wave, and current forces (Applied Technology and Management et al., Inc. 2007); this becomes difficult particularly with certain bottom types. Typically, such monopiles are pile-driven into the bottom, so that areas with softer bottoms are most feasible from a construction standpoint. While drilling through harder bottoms is possible, it can be cost-prohibitive (Coakley 2008). Construction equipment availability for such deep-water infrastructure in the United States is also very limited. Large "jack-up barges" capable of lifting the turbines must be used, along with large pile-driving equipment and cable-laying ship-based equipment (General Electric 2007).

The wind power industry and research institutions are exploring the use of different foundation approaches and technologies to enable siting of turbines in deeper waters. For example, floating turbines have been explored, in part drawing upon the more experienced oil and gas industry. A prototype model was launched in late 2007 offshore Italy in water depths of about 300 feet (Blue H Technologies BV 2007). Current International Energy Agency research includes examination of the use of floating turbines at depths greater than 500 feet (International Energy Agency 2006). Results of a Massachusetts Institute of Technology study indicate that floating platforms at depths of up to 600 feet performed well during modeling and may be economically feasible (Wayman and Sklavanous 2006). Other types of foundations are also being examined. For example, Talisman Energy has a pilot project with a 5 MW-sized turbine that also utilizes a different type of foundation structure (combination mono-pile on top of a truss-supported platform) in approximately 150-foot-deep water (Musial 2007).

The need for potentially long transmission cables connecting offshore sites with the onshore grid leads to concerns not only with construction practicality and cost but also power loss. In general, cables longer than 20 miles in length can have significant power loss (Coakley 2008). However, work is being done to address this issue through improved cable material technology and/or use of converter stations to allow cables to conduct direct current. Additionally, project costs can be increased because of financing institutions' requirements for insurance coverage for the cables, which can add millions of dollars annually in costs (Coakley 2008). Finally, cable connections to the existing electric grid may be an issue if the grid near landfall requires upgrades to handle the new power supply.

A final, but significant, issue with offshore facilities is their inherent high cost of operations and maintenance, which can be up to 25 percent of the cost for offshore projects (Butterfield et al. 2005). Since it is critical that down-time for turbines be reduced as much as possible, accessing and working on in-place turbines in an efficient and safe manner is an important part of a project's economic viability. This has also been an area where technology is coming into play, for example through the development of ultra-stable boats designed to allow workers access to turbine platforms in seas up to six feet in height or more (General Electric Energy 2006).

In general, to address some of the cost issues associated with offshore development, larger turbines are also being developed to improve economies of scale (i.e., reduction in the unit cost per kilowatt generation) for offshore projects. Currently, there is a 3 MW turbine for marine use available in Europe, but not the United States. General Electric is developing a 3.6 MW-sized turbine for use in near-shore environments, which should be commercially available in 3 to 5 years (Applied Technology and Management, Inc., et al. 2007). With grant money from the United States Department of Energy, General Electric is developing a 5 MW-sized turbine with a longer term development horizon (General Electric Energy 2006).

Overall, therefore, despite the issues associated with siting wind turbines offshore, technological advances are improving the economic viability for offshore projects by allowing larger turbines that take advantage of economies of scale and to be sited in deeper waters over which there is greater wind power generation potential. As noted above, indications are that offshore Maine has strong potential for wind power development, and Maine efforts to further understand this potential are underway. As projects in the United States and elsewhere continue to be developed and constructed, this will in turn lead to the necessary experience and technical capability to look at wind power over deeper waters (Musial and Butterfield 2006). Incentives for technological advances (e.g., increased electricity generation costs leading to a more attractive economic model for offshore wind energy development, or government subsidies or programs) may also help to increase the pace of development.

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Attachment L. Emission Benefits of Wind Power

The following pages contain excerpts from DEP and PUC presentations before the Land Use Regulatory Commission in August, 2007. As part of these presentations, LURC had asked about clarifying if wind energy projects reduce greenhouse gas emissions. These presentations explain the emissions benefits regarding reduction in greenhouse gasses.

Wind Power and Air Quality

Maine's Energy Policy and the Development of Wind Power
Land Use Regulatory Commission
August 1, 2007

David Littell, Commissioner, Maine DEP

1

Presentation Outline:

- Maine Climate Action and RGGI
- LURC Questions:
  - RGGI energy efficiency investment: How will it affect electricity prices?
  - Wind energy impacts on climate and air quality?
  - Wind power impacts on cap and trade programs?

2

Wind, Climate, and Air Quality?

- Wind energy, as available, will displace fossil fuel-fired generation in the regional power pool
- Displacing fossil fuel generation reduces emissions of all types thereby improving air quality and climate impacts in Maine and the region

18

LURC Questions

Would wind power in Maine help the state meet its commitments under various cap and trade programs (such as those for NOx, Sox, and CO2)?

Would it affect the cost of these programs to Maine citizens and/or businesses?

19

Wind and Cap-and-Trade

- Yes:
  - Wind generation has no direct emissions
  - Wind displaces generation that does emit SO2, NOx, and CO2, among other pollutants
  - Therefore wind can help the state meet its emission reduction commitments under multiple programs
  - In doing so, wind generation makes it easier and less costly to meet its obligations
  - And, it makes it easier overtime to lower the compliance caps further reducing emissions

20

ISO NE Draft Electricity Scenario Analysis June 2007

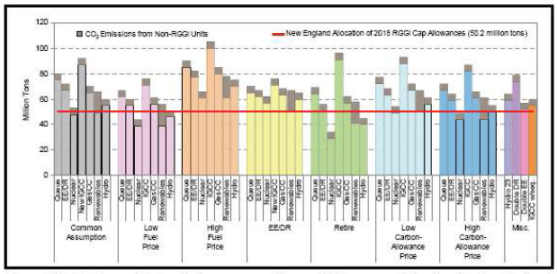

Figure 5-10: Total annual CO_2 emissions, grouped by sensitivity case and showing the New England allocation of the 2018 RGGI cap allowances.

Note: Table includes emissions for units that are not obligated to comply with RGGI requirements.

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ISO NE Draft Electricity Scenario Analysis June 2007

[M]eeting the region's CO_2 emissions targets under the Regional Greenhouse Gas Initiative (RGGI) will require some economic combination of adding substantial amounts of low- or zero – CO_2 emitting resources along with having affected power generators buy additional CO_2 allowances from sources outside the region, relying on offsets in other sectors and re-dispatching the electric system, among other actions. (Page 7)

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MAINE PUBLIC UTILITIES COMMISSION

Wind Power and State Energy Policy
Presentation to the Land Use Regulation Commission
August 1, 2007

Introduction

The Land Use Regulation Commission (LURC) is currently considering three separate wind power development applications. In a July 21, 2007 memorandum, LURC staff asked the Public Utilities Commission (MPUC) to respond to several specific questions and concerns regarding wind power and how wind fits within the State's overall energy policy. The MPUC was asked to provide its response through a presentation during a LURC meeting to be held on August 1, 2007.

The following are the MPUC's responses to the LURC's stated questions and concerns.

MPUC Responses

1. Would new wind power in Maine be consistent with the State's energy policies?

A) Yes. Maine's energy policy supports the development of new wind power in the State as discussed below.

Maine has a long-standing energy policy that favors the development and operation of diverse generation resources, such as wind power, as a means to minimize electricity prices and price volatility. In the Electric Restructuring Act (which became effective in 2000), the Legislature included the following statement of policy:

> In order to ensure an adequate and reliable supply of electricity for Maine residents and to encourage the use of renewable, efficient and indigenous resources, it is the policy of this State to encourage the generation of electricity from renewable and efficient sources and to diversify electricity production on which residents of this State rely in a manner consistent with this section.[1]

[1] 35-A M.R.S.A. § 3210(1).

To implement this policy, the Restructuring Act included a "portfolio requirement" that mandates that at least 30% of the electricity to supply retail customers in the State come from renewable or efficient resources.[2]

In 2003, the Legislature enacted the Maine Wind Energy Act. The Act included legislative findings that state:

> The Legislature finds that it is in the public interest to explore opportunities for and encourage the development, where appropriate, of wind energy production in the State in a manner that is consistent with all state and federal environmental standards and that achieves reliable, cost-effective, sustainable energy production on those sites in the State that will attract investment and permit the development of viable wind energy projects....[3]

The Act also contains a determination of public policy that states:

> It is the policy of the State that its political subdivisions, agencies and public officials take every reasonable action to encourage the attraction of appropriately sited wind-energy-related development consistent with all state and federal environmental standards....[4]

In its 2006 session, the Legislature enacted An Act To Enhance Maine's Energy Independence and Security.[5] The Act contains several policy statements. One of the articulated policies is:

> That the share of new renewable capacity resources as a percentage of the total capacity resources in this State on December 31, 2007 increase by 10% by 2017....[6]

[2] 35-A M.R.S.A. § 3210(3).

[3] 35-A M.R.S.A. § 3402.

[4] 35-A M.R.S.A. § 3404.

[5] P.L. 2005, ch. 677.

[6] 35-A M.R.S.A. § 3210-C(2)(A).

In its April 9, 2007 report, the Maine Energy Council ("MEC")[7] stated:

> The development of renewable generation resources in Maine and throughout the region has the potential to reduce and stabilize electricity costs to Maine consumers, enhance system reliability and reduce the impact on the environment from the generation of electricity.[8]

Finally, during the 2007 session, Maine's Legislature amended the State's portfolio requirement to add a mandate that specified percentages of the electricity supply that serves Maine's consumers come from "new" renewable resources.[9] The purpose of this law is to promote the development of new renewable resources, particularly new wind projects.

2. Is the newly passed law "An Act To Stimulate Demand for Renewable Energy" (L.D. 1920), which established requirements for new renewable power capacity, relevant to the development of wind power in Maine? Would building new wind power facilities be consistent with the new law and its purpose?

A) The newly passed law is not only relevant to the development of new wind power, but its particular purpose is, to a large degree, the promotion of new wind projects. The new law mandates that specified percentages of the State's electricity usage come from "new" renewable resources. The purpose of this law is to create an additional demand for specific types of resources and thus promote their development. Because of the economics and other constraints regarding the development of other types of renewable resources, new wind power is the type of resource that is likely to meet most of the new demand created by the enactment of LD 1920. There would need to be approximately 400 MW of new wind power development over a ten year period to meet the requirements contained in LD 1920.

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[7] The MEC was established by Legislation to evaluate matters affecting electricity supply and costs and to provide recommendations to the Governor, the MPUC, other appropriate state agencies and Legislature regarding these matters. The MEC is composed of legislators and stakeholders with expertise in electricity matters.

[8] MEC Report at 10.

[9] P.L. 2007, ch. 403 (LD 1920).

3. Is there a "transmission congestion" problem in Maine? Essentially, can energy produced by wind generators coming on-line be used, or is there inadequate line capacity?

A) Depending on the location of a particular project, new transmission may need to be constructed so that new wind generation can be used. Transmission costs needed to safely interconnect a project to the grid are the responsibility of the developer. However, the costs of new transmission to relieve "congestion" are not typically the developers' responsibility. Congestion tends to lower energy prices and is likely to impact the assessment of the economics of a new wind project if that project causes congestion. The rules of the ISO-NE (the New England region's transmission system operator) are established to create economic incentives for the removal of transmission constraints. In addition, the economic incentives to remove congestion are magnified by the operation of the federal production tax credits ("PTCs") and renewable energy credits ("RECs"). Both the PTC and REC benefits are directly related to amount of energy actually produced by the generators. Thus, if wind facilities operations are significantly constrained by transmission congestion, they will not receive the financial benefits of the PTCs or the RECs.

4. Wind farm opponents say that Maine already has excess generating capacity and therefore does not need wind generated capacity. Please comment.

A) The wind farm opponents are incorrect. Despite the fact that Maine has excess generation and is currently a net exporter of electricity, the development new diverse generating facilities (i.e. facilities that are not fired by natural gas) in Maine and throughout New England is crucial to the economic needs of Maine. As explained in detail in the MPUC review comments in both the Kibby and Stetson projects, Maine and New England are over-reliant on natural gas generation. This over-reliance on natural gas has resulted in large increases in electricity prices, substantial price volatility, and a less reliable system. For the reasons specified below, the addition of new diverse (non-gas) generating resources spread throughout Maine and New England will have a moderating effect on electricity prices and price volatility, and result in a more secure system.

As more non-gas generation is added to the mix, cheaper gas resources and non-gas resources will set the clearing prices in a greater number of hours. This would have the general effect of reducing both the level and volatility of electricity prices throughout the region. To the extent new generation is constructed within Maine's borders, the benefit to Maine consumers is more direct in that the result would be lower prices within the Maine zone. In addition, any overall reduction in the demand for gas that results from the addition of non-gas resources in the region should have the effect of reducing the price of natural gas which translates

into lower electricity prices. Moreover, a reduction in the region's reliance on natural gas would result in a more secure system that is less vulnerable to gas shortages and thus less susceptible to curtailments and blackouts. The addition of new generation within Maine has the additional benefit of making it less likely that shortages of electricity that may occur in the rest of New England would affect service in Maine. For example, if the addition of new resources in Maine increases the amount of time that transmission constraints out of Maine exists, the ISO-NE is less likely to require rolling blackouts in the region to include Maine.

5. Will wind power displace another clean energy source (like hydro)?

A) Because wind and other clean energy sources like hydro facilities have no fuel costs, both should generally operate to their full capacity (depending on the availability of wind and water). One resource may displace another if there is a transmission constraint in the region in which the resources are located. However, as mentioned above, economic incentives exist for such transmission constraints to be removed. If constraints are not removed, then consumers could benefit from lower prices. Many would view this result as a benefit.

6. Because wind is an intermittent source, is it necessary to keep fossil fuel generators on-line to provide energy when the wind farms are not generating?

A) The intermittent nature of wind power will not result in any additional need to keep fossil fuel generators "on-line" to provide backup energy when the wind facilities are not generating. Current regional rules already require that a certain amount of "reserve" generation be available in the event of generator outages. The amount of reserves is based on the size of the largest resources in the region. For New England, the largest resources are Seabrook (1200 MW) and the Hydro-Quebec tie line (1700 MW). Thus, a number of wind facilities spread across the region of the capacities contemplated would have no effect on the operation of the region's reserves.

5

Attachment M. Approach to Scenic Impacts

38 M.R.S.A. § 484(3) of the Site Law requires a developer to demonstrate that it has made "adequate provision for fitting the development harmoniously into the existing natural environment" and that the development not unreasonably adversely affect "existing uses, [and] scenic character." The Task Force recommends that, within the expedited area and for scenic considerations only, the requirement for fitting wind power projects harmoniously into the existing natural environmental be eliminated,[30] and that an amendment to Section 484(3) be adopted to clarify how the existing uses and scenic standard applies to wind power projects. Language to the following effect is proposed as a new Section 484(3)(G) to the Site Law; again, this language would apply only in the expedited area:

"The Legislature recognizes that wind turbines are potentially a highly visible feature of the landscape and will have an impact on views; therefore, the requirement that a development fit harmoniously into the natural environment is eliminated for wind power projects and the test for determining whether a wind power project adversely affects existing uses and scenic character is whether the development significantly compromises views from scenic resources of state or national significance such that it has an unreasonable adverse impact on scenic values and existing uses of those scenic resources."

It is understood that existing uses can include the appreciation of scenic resources.

In addition, the Department would adopt the following as guidance, similar to what the Department has proposed for bird and bat studies.

- In determining whether a project significantly compromises views from scenic resources and as a result would have unreasonable adverse impacts on those scenic resources and existing uses, the Department shall consider only the scenic resources identified in Attachment G to the Task Force Report [Scenic Resources of State or National Significance].
- The Department shall provide guidance to the applicant on whether a visual impact assessment is required to evaluate visual impacts on identified scenic resources.
    - There shall be a rebuttable presumption that no visual impact assessment is required for those portions of the project located more than three miles from a scenic resource. The Department may require a scenic analysis beyond three miles if it is persuaded by substantial evidence that the scenic resource is especially significant and that impacts may be substantial.
    - Portions of a project located more than eight miles from a scenic resource will be understood to be insignificant from a scenic perspective.
    - In determining whether a visual impact assessment is required and in determining whether a project has an unreasonable adverse impact on scenic resources and existing uses of those resources, the Department shall take into account:

[30] Note the precise mechanism for accomplishing this has yet to be determined and in fact it might be possible to accomplish by simply clarifying how the requirement may be met for scenic considerations.

  - The significance of the scenic resource;
  - The existing character of the surrounding area;
  - The expectations of the typical viewer;
  - The project purpose and the context of the proposed activity;
  - The extent, nature, and duration of public use; and
  - The scope and scale of the potential impact of the project views on the scenic resource, including the number and extent of turbines and transmission lines visible from the scenic resource, as well as their distance from the scenic resource and the project's prominence in the landscape.

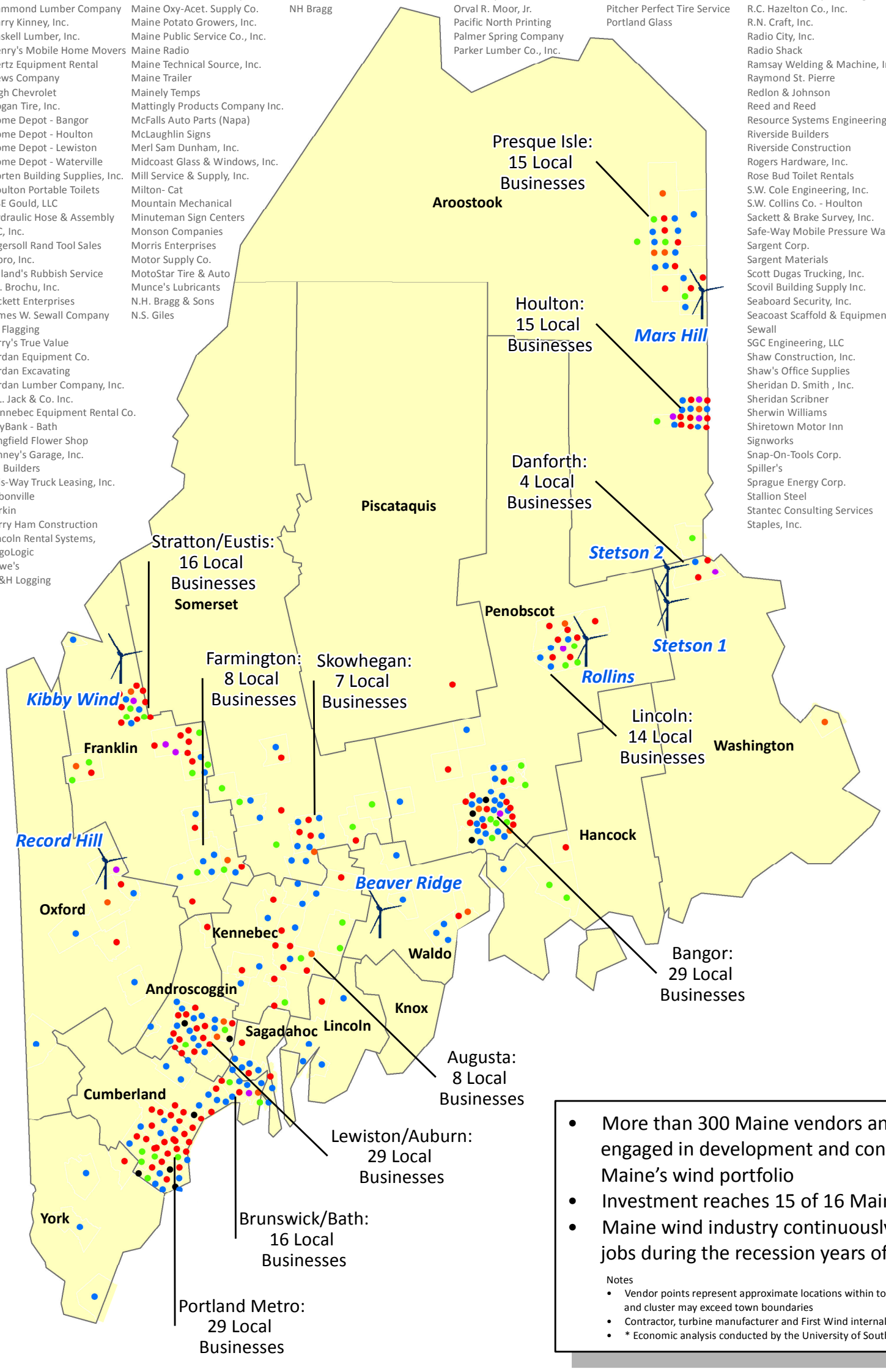
- In determining whether a project has an unreasonable adverse impact on scenic resources and existing uses related to those scenic resources, the Department recognizes that wind turbines are potentially a highly visible feature of the landscape and may have an impact on views. The fact that the project, including but not limited to, one or more turbines or part of a transmission line, may be a highly visible feature in the landscape does not by itself mean the visual impact is unreasonable, even if the scenic resource is a high value resource used by many members of the public. Other factors to consider are the scenic character of the landscape in which the project is located, the expectations of users of the scenic resource, and how significantly the public's use and enjoyment of the resource would be adversely impacted by the presence of the project.

- The Task Force recommends that this same approach for reviewing the scenic impacts of wind power projects be adopted by the Land Use Regulation Commission, and recognizes that this will require statutory changes to accomplish this objective.

- The Department of Environmental Protection and the Land Use Regulation Commission shall adopt guidance to implement this approach.

Maine Businesses
Benefitting From Wind Investment

A.D. Electric, Inc.
A.H. Harris & Sons, Inc.
Absolut Services, Inc.
ADA Fence Company, Inc.
Advanced Wireless Services
Aerial Survey and Photo
Affordable Well Drilling, Inc.
Allison's LLC.
Ames Supply
Andy's Silkscreen
Applicators Sales & Svc., Inc.
ARC Enterprises, Inc.
Archie's, Inc.
Arnold Trail Quality Fuels
Aroosta Cast, Inc.
Aroostock County Electric
ASC Trucking
Atmosforecast
Aubuchon Hardware Co.
Auburn Concrete
Bangor Hydro-Electric Co.
Bangor Truck & Trailer
Barton & Gingold
Bath Electrical Services Corp.
Bath Industrial Sales
Bath Printers, Inc.
Belfast Auto Supply
Bernstein Shur
Best Western White House Inn
Big Rock Ski Area
Bill Dodge Oldsmobile, Inc.
BKB Construction
Black Bear Ladder
Blane Casey Building
Bob Barrows Chevrolet, Inc.
Brackett's Pumping
Brake Service & Parts
Briarwood Motor Inn, Inc.
Bridgham Engineering
Brunswick Ford
Bucksport True Value
C.W. Hayden
Cahill's Tire Co.
Cal's Septic Service, Inc.
Cam Manufacturing, Inc.
Carquest - Bangor
Carquest - Bath
Carquest - Fort Fairfield
Carquest - Houlton
Carquest - Presque Isle
Carrabbasset Printing
Cashman Communications
Central Maine Power Co.
Central Maine Rebuilders, Inc.
Central Tire Co., Inc.
Chad Little Power Equip. Inc.
Cianbro Corp.
Cintas
Clean Harbors
Clukey's
Comprehensive Land Techs.
Cooley's Commercial Tire
Daniel Chase Plowing
Dave's Hardware
Dead River Co.
Douglas Bennett & Son
Downeast Mobil Pressure Wash
Dragon Products Company, LLC
Drinkwater's Cash Fuel,
Dubay Auto Parts (NAPA)
E.S. Boulos Company
Eagle Rental, Inc.
Eastern Maine Electric Coop.
Eastern Sales & Equipment, Inc.
EBS-Ellsworth Bld. Sply, Inc.
Edwin Tash, Sr.
Eldredge Lumber & Hardware
Ellis Pond Variety
EMI Electrical, Whiting
Environmental Projects, Inc.
Express Electrical
F. W. Webb Company
Fairpoint Comms - Bangor
Fairpoint Comms - Lewiston
Farmington Oil Company
Farmington Tire
Fastenal Company, Inc.
Ferris Oil - Presque Isle
Fire Tech & Safety of NE, Inc.
Firesafe Equipment, Inc.
First Settler's Lodge, LLC
Flagstaff Construction
FleetPride Inc.
FMCCADD Engineering Resource
Foss & Son, Inc.
Fotter's Market & Hardware
G.E. Goding & Son, Inc.
Gagne Precast Concrete Product
Gagnon Engineering Inc.
GES
Gilman Electrical Supply
Gil's Sanitation, Inc.
Good Jake, LLC
Goodman Wiping Cloth Co.
Goodwin
Goodwin Well & Water, Inc.
Gould Equipment
Grand Rental Station
Greg's Home & Leisure
H. C. Haynes, Inc.
H.O. Bouchard Transport
Haley Construction
Hamilton Marine
Hammond Lumber Company
Harry Kinney, Inc.
Haskell Lumber, Inc.
Henry's Mobile Home Movers
Hertz Equipment Rental
Hews Company
High Chevrolet
Hogan Tire, Inc.
Home Depot - Bangor
Home Depot - Houlton
Home Depot - Lewiston
Home Depot - Waterville
Horten Building Supplies, Inc.
Houlton Portable Toilets
HSE Gould, LLC
Hydraulic Hose & Assembly
IEC, Inc.
Ingersoll Rand Tool Sales
Inpro, Inc.
Ireland's Rubbish Service
J.L. Brochu, Inc.
Jackett Enterprises
James W. Sewall Company
JD Flagging
Jerry's True Value
Jordan Equipment Co.
Jordan Excavating
Jordan Lumber Company, Inc.
K.L. Jack & Co. Inc.
Kennebec Equipment Rental Co.
KeyBank - Bath
Kingfield Flower Shop
Kinney's Garage, Inc.
KR Builders
Kris-Way Truck Leasing, Inc.
Labonville
Larkin
Larry Ham Construction
Lincoln Rental Systems,
LogoLogic
Lowe's
M&H Logging
Macfarlane Steel Corp.
Mail It 4 U
Maine & Maritimes Corp.
Maine Commercial Tire Inc.
Maine Drilling & Blasting
Maine Fire Equipment Co., Inc.
Maine Fire Prevention Services
Maine Fire Protection Systems
Maine Oxy-Acet. Supply Co.
Maine Potato Growers, Inc.
Maine Public Service Co., Inc.
Maine Radio
Maine Technical Source, Inc.
Maine Trailer
Mainely Temps
Mattingly Products Company Inc.
McFalls Auto Parts (Napa)
McLaughlin Signs
Merl Sam Dunham, Inc.
Midcoast Glass & Windows, Inc.
Mill Service & Supply, Inc.
Milton- Cat
Mountain Mechanical
Minuteman Sign Centers
Monson Companies
Morris Enterprises
Motor Supply Co.
MotoStar Tire & Auto
Munce's Lubricants
N.H. Bragg & Sons
N.S. Giles
Napa Auto Parts - Lincoln
Napa Auto Parts - Store # 3020
Napa Auto Parts - Store # 3022
Napa Auto Parts - Wilton
Netherlands Office Products
New Meadows Marina Inc.
NC Hunt
NES Rentals
NH Bragg
Nichols Motors (Napa) #3425
Nickerson Construction, Inc.
Norpine Landscape, Inc.
Northeast Merchandising Corp.
Nortrax Equipment Co.
On Target
Oquossoc Marine
Orion Ropeworks, Inc.
Orval R. Moor, Jr.
Pacific North Printing
Palmer Spring Company
Parker Lumber Co., Inc.
Paul G. White Tile Co. Inc.
Paul O'Halloran, Inc.
Pepin's General Store
Perkins Olson, P.A.
Persephone Ditzel
Pine Tree Waste-Houlton
Pine's Market
Pioneer Wireless, Inc.
Pitcher Perfect Tire Service
Portland Glass
Portland Plastic Pipe
Portland Welding Supply
Power Point
PRC Industrial Supply, Inc.
PSC Industrial Outsourcing, LP
Puiia Lumber Company, Inc.
Quality Assurance Labs, Inc.
R. Stewart Heavy Trucking
R.C. Hazelton Co., Inc.
R.N. Craft, Inc.
Radio City, Inc.
Radio Shack
Ramsay Welding & Machine, Inc.
Raymond St. Pierre
Redlon & Johnson
Reed and Reed
Resource Systems Engineering
Riverside Builders
Riverside Construction
Rogers Hardware, Inc.
Rose Bud Toilet Rentals
S.W. Cole Engineering, Inc.
S.W. Collins Co. - Houlton
Sackett & Brake Survey, Inc.
Safe-Way Mobile Pressure Wash
Sargent Corp.
Sargent Materials
Scott Dugas Trucking, Inc.
Scovil Building Supply Inc.
Seaboard Security, Inc.
Seacoast Scaffold & Equipment
Sewall
SGC Engineering, LLC
Shaw Construction, Inc.
Shaw's Office Supplies
Sheridan D. Smith , Inc.
Sheridan Scribner
Sherwin Williams
Shiretown Motor Inn
Signworks
Snap-On-Tools Corp.
Spiller's
Sprague Energy Corp.
Stallion Steel
Stantec Consulting Services
Staples, Inc.
StarCellular
Steel Service
Steelstone Industries
Stratham Tire, Inc.
Sue McFarland
Sugarloaf Mountain Corp
Sun Journal
Sunbelt Rentals, Inc.
Susan's Prof.Housekeeping
Sutherland Weston Comm.
Swallow's Electric
T&L Enterprises
TDS Telecom
Terra Magna Services, Inc.
The Broadway Deli
The Lane Construction Corp.
The Oliver Stores
Theriault Tree Harvesting, Inc
Time Warner Cable
Transco Business Technologies
Transco Union Office
Travis Kearney
TRC
Treeline, Inc.
TriState Flag, Inc.
Underwood Electric, Inc.
Unifirst
United Electrical Systems
United Rentals
Valley Gas Company
Verizon Wireless
Verrill Dana
Vickie St. Hilaire
Viking Lumber, Inc.
Vip
W.A. Messer Co.
W.D. Matthews Machinery
Waldo County Oil & Propane Inc.
Wally Hanson Advertising
Walsh Supply, Inc.
Waste Management of ME
Wattles
Waugh's Mountain View Electric
WD Matthews
Western Maine Supply, Co.
Wheeler Hill International Inc.
White Sign
Whited Ford Truck Center, Inc.
Whiting's Electric
Williams Scotsman, Inc.
Willis of Northern New England
Wilner-Greene Associates, Inc.
Windward Petroleum
Winslow Marine, Inc.
Wood's CRW Corp.
Worcester Brothers
WW Grainger Inc.
WWGR – Portland ME
Yankee C.T. Inc
Yankee Custom, Inc.



- More than 300 Maine vendors and contractors engaged in development and construction of Maine's wind portfolio
- Investment reaches 15 of 16 Maine counties
- Maine wind industry continuously supported 600 jobs during the recession years of 2008-2009*

Notes
- Vendor points represent approximate locations within towns and cluster may exceed town boundaries
- Contractor, turbine manufacturer and First Wind internal vendor reports
- * Economic analysis conducted by the University of Southern Maine

Business Catagory

- Development and Construction
- Electric and Utility
- Equipment and Supply
- Hospitality
- Logistics
- Support Services
- counties
- Wind Projects

N W E S

0 15 30 60 Miles

Maine Businesses
Benefitting From Wind Investment

Map Scale
1 centimeter = 24,265 meters

2011-02-28

The Employment Impacts of Wind Power Development in Maine 2003-2010

Charles S. Colgan PhD
Maine Center for Business and Economic Research
University of Southern Maine

For

First Wind, Inc
TransCanada Maine Wind Development Inc.

February 2011

SUMMARY:

- Analysis of 257 megawatts of wind power capacity in three projects in western, eastern, and northern Maine over 7 years
- Over 7 years an average 240 direct and indirect jobs were created
- During peak years of construction, 600 jobs were created each year
- Construction of these wind power projects required inputs from more than 300 Maine firms

The development of wind power in Maine has emerged as a significant economic opportunity in the past several years, providing one of the few growing sectors in the latter half of the last decade. The employment impact of this development has been discussed in regulatory filings before, but has not been examined in detail using post-construction data on actual wind power projects. This report examines the employment impacts of three major wind power projects: Mars Hill in Aroostook County, Stetson Mountain in Washington County, and Kibby Mountain in Franklin County. (Stetson and Kibby were undertaken in two phases.) These projects together provide 257 megawatts of installed generating capacity.

The first two projects were developed by First Wind and the third project by TransCanada Maine Wind Development Inc. Mars Hill was the first utility-scale wind project in Maine and construction was completed in 2006. The Stetson Mountain projects were constructed during 2008-2010, while the Kibby Project was built in 2009-2010. However, planning for these projects stretched back to 2003. Together the projects required development expenditures of over $642 million for the purchase of generation and transmission equipment and for the construction of the wind turbines and associated transmission lines.

In sum, over the eight years of planning and construction for these three major wind power projects, an average of 240 jobs per year were created or supported in the Maine economy. During the peak years of construction activity in 2008 and 2009, both years of severe distress in the Maine economy brought on by the national recession, wind power construction created or supported an average of over 600 jobs. Employment impacts during the peak construction years averaged 2 direct and indirect jobs per installed megawatts of generating capacity for all projects

To ascertain the employment impacts of these projects, data was obtained from the two development companies plus Reed & Reed Inc., the construction company for all three projects. This data was then analyzed with economic models of the Maine economy developed by Regional Economic Models Inc. (REMI) of Amherst, MA and maintained by the Maine Center for Business and Economic Research (MCBER) at the University of Southern Maine. REMI models are widely used to analyze economic impacts by comparing economic performance with and without a specific change such as wind power construction.

For purposes of analysis, three major industries are considered to be directly affected by the projects:

- Construction
- Project planning and permitting services provided by the professional and technical services industry
- Food and accommodation for construction workers who require accommodation while constructing the project

Table 1 shows the expenditures in each of these areas in Maine for the three projects over the period of development and construction. These represent expenditures in Maine for Maine-supplied goods and services related to the projects, which Reed & Reed reports come from 300 different Maine companies. These figures do not include expenditures for turbines, blades, towers, and transformers, which are sourced outside of Maine.

	Total 2003-2010
Construction	$197.82
Food & Lodging	$1.31
Professional & Technical Services	$23.67
Total	$222.79

Table 1 Wind Power Development and Construction Expenditures in Maine ($ Millions, excludes equipment manufactured outside Maine)

The figures in Table 1 represent that portion of the total costs of the projects that was spent on Maine-provided goods and services. The total cost of the projects was $642 million. The difference between this total and the total in Figure 1 represents the turbines, towers, and transmission equipment that are manufactured outside of Maine.

Table 2 shows the employment and output impacts from the three projects in the Maine economy. The table shows direct, indirect and total employment effects estimated by the REMI model.

	Maine							
Direct Employment	2003	2004	2005	2006	2007	2008	2009	2010[1]
Construction				220	5	470	520	114
Food & Lodging						15	20	5
Prof & Tech Services	3	5	10	30	30	45	25	10
Total Direct	3	5	10	250	35	530	565	130
Indirect Employment	2	10	5	75	15	160	145	25
Total Employment	5	15	15	325	50	690	710	155

Table 2 Estimated Job and Output Impacts of Wind Power Projects

The employment estimated includes both "new" and "supported" employment. "New" employment includes jobs that would not exist "but for" the wind power projects. Many of these jobs will have been taken by those living in the vicinity of the projects, though the exact distribution is not available. These are primarily the jobs directly engaged in the construction activity. Other jobs in the service industries and industries such as retail trade (part of indirect employment) are not created by the projects, but a portion of the incomes earned in these jobs is derived from the spending associated with the projects.

A major portion of the employment benefit is the wages paid within Maine, which are estimated at $46.8 million, or $182,000 per megawatt installed. The average hourly pay, including benefits, for the construction activities is estimated by Reed & Reed at $29.00 per hour.

Once constructed, the Mars Hill, Stetson, and Kibby projects will require about 30 people for operations, including conducting routine maintenance and assuring safe operations of the turbines. These operational period jobs will support an annual average 15 additional "indirect" jobs. It should also be noted that over the lifetime of these projects there will be periodic repair, maintenance and overhaul projects during which higher employment levels may be experienced. The timing and magnitude of such projects cannot be accurately predicted at this time because the projects are all relatively new. But total employment impacts over a 20-30 year project operational period will be higher than indicated by these regular annual figures.

The wind power projects examined here primarily affected four regions: Aroostook County (Mars Hill), Eastern Maine (Stetson I and II), Western Maine (Kibby Mountain), and

[1] Through July 2010. This figure excludes the Rollins Project under development by First Wind.

Cumberland County, where much of the professional and technical service support is provided. Reed & Reed and Cianbro, with headquarters in Sagadahoc and Somerset counties respectively, provided much of the major construction services, but smaller firms located in virtually all other Maine counties supplied parts or services to the construction projects.

The relatively remote sites for the Stetson and Kibby projects brought workers into these areas who lived throughout Maine and their spending in the economically distressed communities near the projects such as Mars Hill, Eustis, Farmington, Lincoln and Houlton while working on the project was a boost to these communities. Economic impacts also occurred in the home communities of the workforce and in the retail centers such as Bangor, Presque Isle, and Lewiston-Auburn.

Notes

1. The installed capacity for the four projects is:

	Megawatts Installed Capacity
Kibby	132
Mars Hill	42
Stetson I	57
Stetson II	26
Total	257

2. Four regions of the seven regions in the REMI models for Maine are directly affected by the wind power projects:

   - Aroostook County
   - Eastern Maine (Penobscot, Piscataquis, Hancock, and Washington counties)
   - Western Maine (Androscoggin, Franklin, and Oxford counties)
   - Cumberland county

3. Employment in this analysis is the Bureau of Economic Analysis "total employment" concept, which includes self employment as well as wage & salary employment. It includes both full and part time jobs without distinction.

4. For purposes of analyzing the "professional and technical services" industry, expenditures for such purposes as meteorological monitoring and soils testing were assigned to the region where the project was constructed. Other professional and technical service expenditures were assigned to Cumberland County, where most of the professional services are located. Some of the expenditures in this category may have been made in other regions of Maine, but records do not indicate where specific expenditures were made. Employment in professional and technical services is reported in the statewide totals.

DOWNEAST SALMON FEDERATION

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(207) 483-6057 FAX
dsf@panax.com
www.mainesalmonrivers.org

Blue Sky East LLC
120 Middle St.
Portland, ME 04101
Attn.: Geoffrey West, Environmental Coordinator

January 21, 2011

Dear Mr. West,

I take this opportunity to acknowledge your company's commitment to the conservation of the Narraguagus River Watershed through your pledge of $25,000 to our land trust program. The Downeast Rivers Land Trust was established in 1999 by our organization to maintain the quality of the environment and public access associated with the salmon rivers in this region.

The contribution by your company constitutes a significant "Tangible Benefit" associated with your proposed development of the Bull Hill wind power site on the height of land that divides the Union River Watershed and the Narraguagus.

Our organization believes that wind power generation is an appropriate and necessary component of the future for our country and that the development at Bull Hill in TWP 16 is well planned. We have been assured that the construction and maintenance phases of the project will have minimal environmental consequences, while the economic benefits are quite substantial. Conservation of the most important and threatened features of the landscape – such as the work we do to protect critical riparian habitats – costs money. The funds supplied by Blue Sky East under this Tangible Benefits award will help in this regard and will provide long term and positive impact in the nearby communities.

Sincerely,

Dwayne Shaw
Executive Director