October 20, 2009

Subject: Transmittal to ISEA Council of the Wind Task Force Report

Dear Council Members:

The purpose of this letter is to transmit to you a report summarizing issues, opportunities, and suggested actions to address the State of Idaho energy objectives outlined in the Legislature's 2007 Idaho Energy Plan. This report is focused on Wind resources.

The Board of Directors (Board) of the Idaho Strategic Energy Alliance (ISEA) recognizes and thanks the Wind Task Force, one of more than a dozen expert groups working as part of the Alliance, for their development of this report. The ISEA Task Forces are comprised of volunteer experts, including energy engineers, developers, private and academic researchers, regulators, and policy experts who have come together in the interest of Idaho citizens to develop and analyze options, provide information, and build partnerships necessary to address Idaho's energy challenges and capitalize on Idaho's energy opportunities. The reports produced by these Task Forces present an understanding of the current status and potential path forward for each resource, and as such, provide a first step in executing the Legislature's 2007 Energy Plan.

The core of this report is the identification of barriers and challenges to, and the development of options for expanding development of wind resources in Idaho. The conclusions and recommended options are not intended to be exhaustive, but rather, form a starting point for informed discussions.

As you know, it is the Board's responsibility to evaluate the potential benefits and costs of the recommended options developed by ISEA Task Forces. Our initial review comments on the Wind Task Force report are summarized in this transmittal. The Board believes that an adequate policy assessment of individual reports cannot be made, however, until all of the Task Force reports and options have been evaluated together, including considerations of Economic Development & Finance, Energy Transmission, and Communications. In this respect, both this report and the Board's comments should be viewed as "living documents" that will be updated as significant new information and/or perspectives emerge.

Summary of Task Force Recommendations

The Task Force recommendations, which are listed below, are described in detail in the body of the report. In some instances, the ISEA Board concurred completely with the Task Force recommendations. In other instances, there was conditional or no consensus. In all cases, we as a Board feel that it is valuable for you to have an understanding of the recommendation, its potential benefits and downsides.

The Wind Task Force identified thirty-one recommended options as having potential to enhance development of wind resources in Idaho. These options are grouped in six categories, and those identified by the Task Force as having particularly significant potential are underlined:

A. Project Economics

1. Provide a Transferrable State Tax Credit for Wind
2. Create an Idaho Energy Trust
3. Provide a Credit Backstop to Facilitate IERA Project Financing
4. Enhance Utility Green Power Offerings
5. Increase Caps for Net Metering
6. Revisit Valuation of Externalities in Utility IRP's
7. Provide an Operating Fund for IERA
8. Attract Wind Manufacturing to Idaho
9. Pre-Approve Wind Resource Acquisition

B. Siting and Permitting

1. Develop Better Policy Definitions
2. Develop Transportation Guidebook for Oversized Loads
3. Develop Standardized MET Tower Permit
4. Develop Standardized Hazmat Regulations for Wind
5. State Lead Environmental Permitting

C. Public Utilities Regulatory Policy Act (PURPA)

1. Streamline the Avoided Rate Process
2. Require Performance Guarantees in All PURPA Contracts
3. Increase Limit on PURPA Projects to 20 MWa

D. Transmission

1. Accelerated Recovery for Transmission Investment by Developers
2. Utilities Fund Upgrades in Renewable Energy Zones
3. Require Transmission Studies in IRP's
4. Create an Idaho Transmission Planning Group
5. Enable IERA to Fund Transmission
6. Streamline Permitting and ROW Acquisition

E. Variability of Wind

1. Encourage Balancing Authority Pooling
2. Encourage NW Ancillary Service Markets
3. Encourage Short-Term Spot Power Market
4. Value Geographic Diversity in Wind Acquisitions
5. Evaluate DSM for Wind Integration
6. Evaluate Time-of-Use Pricing for Wind Integration
7. Fund Research for Energy Storage Technologies

F. Stakeholder Outreach

1. Develop a Program to Refute Misinformation about Wind
2. Limit Use of Misinformation in Permitting Processes

The Board was unanimous in support of several recommended options, including, Transferrable Tax Credit A(1); Wind Manufacturing A(8); Pre-Approval of Wind A(9); all five options under (B) Siting and Permitting; Streamlining of the SAR Process (C) 1; Contract Performance Guarantees (C) 2; Streamlined Permitting (D) 6; Geographic Diversity (E) 4, and Time of Use Pricing (E) 6. This last option, while it could be of value to utilities, does not, in the opinion of the Board, lend itself to state rule or regulation.

The Board was also unanimously opposed to many of the recommended options, including: Creating an Energy Trust (A) 2; Providing Backstop IERA Financing (A) 3; Operating Fund for IERA (A) 7; Increase PURPA Limit (C) 3; Accelerated Investment Recovery (D) 1; Upgrades in Renewable Energy Zones (D) 2; Transmission Expansion Studies (D) 3; Transmission Planning Group (D) 4; IERA Fund Transmission (D) 5; Balancing Authority Pooling (E) 1; Ancillary Services Markets (E) 2; Spot Power Market (E) 3; DSM for Wind (E) 5, and Energy Storage Technologies (E) 7.

The Board's support was mixed for several recommended options, and these may be candidates for further evaluation and discussion. These options included: Green Power Offerings (A) 4; Net Metering Caps (A) 5; Valuation of Externalities in IRP's (A) 6, and Transmission Studies in IRP's (D) 3.

In overview, there is no question that the slate of recommended options could help facilitate development of wind (and other resources) in Idaho. In rejecting a large number of the options, however, the Board recognized that many of the recommendations either posed inappropriate risks or costs for electric consumers (e.g. utilities funding transmission upgrades for wind), or were very difficult to, or clearly outside the purview of the State of Idaho, to implement (e.g. establishing electricity spot and services markets).

Proposed Action Items

In addition to commenting on recommended options, the Board believes it is helpful to suggest the organizations to which the Governor's Office or the Legislature might consider assigning the responsibility for evaluating, and possibly implementing recommended options. This evaluation would include, as appropriate, development of an implementation plan and timeline. In addition, we offer members of the Board and the Task Force as a resource to the reviewing organizations during the initial review and scoping of the recommendation, as well as during the evaluation and implementation. The Board's recommendations are presented below.

- **Department of Commerce**
  1. Evaluate the Transferrable Business Tax Credit (A) 1
  2. Attracting Wind Manufacturing Industries (A) 8

- **Office of Energy Resources**
  1. Improved Policy Definitions (B) 1
  2. State Lead in Environmental Permitting (B) 5
  3. Streamlined Transmission Siting and Right of Way (D) 6

- **Public Utilities Commission**
  1. Possible Streamlining of the SAR Process (C) 1
  2. PURPA Contract Performance Guarantees (C) 2
  3. Accelerated Transmission Investment Recovery (D) 1
  4. Evaluate Premium for Geographic Diversity of Wind (E) 4
  5. Potentially Evaluate Green Power Offerings (A) 4*
  6. Potentially Evaluate Net Metering Caps (A) 5*
  7. Potentially Evaluate Externalities in Utility IRP's (A) 6*
  8. Potentially Evaluate Need for Transmission Studies in Utility IRP's (D) 3*

     *Options for which there was not unanimous support by the Board

- **Department of Transportation**
  1. Transportation Guidebook for Oversized Loads (B) 2
  2. (Aeronautics Division) Standardized Permit for MET Towers (B) 3

Department of Environmental Quality

1. Standardized Hazmat Regulations for Wind Projects (B) 4

Again, the Board is pleased to commend the work of the Wind Task Force and is pleased to submit their report to Council members for your review.

Steven E. Aumeier,

Chair, ISEA Board of Directors

<u>Idaho Strategic Energy Alliance Board Members</u>:

Eldon Book, Intermountain Gas
Krista McIntyre, Stoel Rives
Larry La Bolle, Avista
Russ Hendricks, Idaho Farm Bureau
Ralph Williams, United Electric Co-op
Carol Hunter, Rocky Mountain Power
Don Sturtevant, J. R. Simplot Company
Paul Kjellander, Office of Energy Resources
Jim Kempton, Idaho Public Utilities Commission
Michael Louis, Center for Advanced Energy Studies/Energy Policy Institute
Ric Gale, Idaho Power Company

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Project Economics	1	**Make Tax Credits Transferrable**	9, 46	Pro:	If developers don't have enough tax liability to absorb a credit, it can be sold & they can still benefit
				Pro:	Would align Idaho policy with other state and federal tax credit programs
				Con:	No proof that this will improve the market for wind powered-generation
				Con:	A significant drain on state revenues (100 MW ~ $6 million)
	2	**Create an Idaho Energy Trust**	9, 47	Pro:	Could fund renewable energy infrastructure & economic development
				Pro:	Could be used to market Idaho for renewable energy and related manufacturing
				Pro:	Could in part be allocated for research into energy storage systems for variable renewable resources
				Con:	Poorly defined and very narrow agenda, option characteristics not well defined
				Con:	Any viable proposal of this nature must be broadly supported, thoroughly vetted, and be demonstrated to be in the best interest of all Idaho electric consumers. There is no evidence that this is beneficial to the state.
				Con:	Not historically supported by the Idaho Legislature
				Con:	Increases ratepayer burden, though slightly, and only on residential class
	3	**Provide Credit Backstop to IERA**	9, 48	Pro:	May allow small developers access to low cost financing
				Con:	There is no need to provide any funding to the IERA until a developer requests it, i.e. a proven need
				Con:	Potential risk where state would be backing projects that are considered too high of a credit risk by other players
				Con:	The IERA has no proven track record
	4	**Offer Green Power Rates Statewide**	40, 51	Pro:	Funds can go toward purchase of Renewable Energy Credits
				Pro:	May increase demand for wind
				Pro:	Additional choices for customers
				Pro:	Level playing field for private/public utilities
				Pro:	Funds could be used for renewable energy projects at schools
				Pro:	May provide electric consumers who do not have this opportunity through their serving electric utility with a means to participate in REC markets

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Project Economics (cont.)	4	**Offer Green Power Rates Statewide (cont.)**	40, 51	Note:	Existing and developing REC markets are (and should be) open and transparent, provide liquidity, and be positioned to capitalize on RECs generated throughout North America. If Idaho's purchase of RECs is restricted to just those generated within Idaho, electric consumers would likely be subject to paying higher prices for their green power than they otherwise would if the RECs were purchased from a broader market.
				Con:	Most customers already have this option through their utilities
				Con:	Adminstratively burdensome, especially for small publics
				Con:	This concept may bifurcate both capital costs and operations and maintenance costs between two groups of ratepayers
				Con:	Customers would have to commit to long-term assets without the ability to switch back and forth between rate schedules to optimize their bills
				Con:	Would bifurcate capital, operations & maintenance costs between two groups of ratepayers, raising rates
	5	**Increase Net Metering Caps**	41, 51	Pro:	May encourage more agricultural & industrial customers to participate, reducing or eliminating their power bills
				Pro:	May reduce burden on transmission/distribution because it is like distributed generation
				Pro:	Customer can benefit from economies of scale
				Pro:	Customers can better fit generation size to load
				Pro:	Considered "clean energy"
				Con:	A customer with a generator capable of delivering 2 MW would seek to sell that power to the utility under a more-lucrative PURPA contract rather than through a net-metering arrangement.
				Con:	Potential for infrastructure upgrades where generation capacity exceeds peak load
				Con:	Limit increases in surrounding states (Utah) have not resulted in an increase in net metering customers
				Con:	Why revisit when existing rules allow for such changes
	6	**Revisit Externalities in IRPs**	42-43, 51	Pro:	Would improve quality of the IRP by including emission levels & fuel risk in the analysis
				Pro:	Would improve quality of the IRP by including state and local job benefits and transmission
				Pro:	Assigning a higher value to renewable resources recognizes the risk of carbon-based resources

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Project Economics (cont.)	6	**Revisit Externalities in IRPs (cont.)**	42-43, 51	Pro:	Many utilities are already doing this - including detailed analyses of emissions and fuel-price risks (as well as other externalities)
				Pro:	Including more interest groups may yield a better outcome
				Con:	Would require a PUC hearing and evidence to support the benefit of this
				Con:	Utilities should not be setting social policy (i.e., accounting for externalities to their business)
				Con:	Utilities already are moving in this direction
				Con:	The Commission would not do this without a hearing and evidence to support the benefit of the recommendation.
				Con:	Including more interest groups may just add complexity and confusion to the process
	7	**Fund IERA for Renewables**	48	Pro:	May allow small developers access to low cost financing
				Con:	Majority of wind development will come from utilities and larger developers who likely wouldn't benefit from IERA funding
				Con:	Should state subsidize smaller developers at the expense of utilities and larger developers
				Con:	Potential risk where state would be backing projects that are considered too high of a credit risk by other players
				Con:	There is no need to provide any funding to the IERA until a developer requests it, i.e. a proven need
	8	**Fund Wind Manufacturing Initiative**	49	Pro:	Attracting new industries (such as wind manufacturing) to Idaho financially benefits the state
				Pro:	A coordinated campaign could highlight Idaho's benefits to new business & provide access to Idaho info
				Pro:	Opportunity to leverage existing Idaho infrastructure (roads, rail, fresh water port)
				Pro:	A coordinated campaign could encourage recruitment of new business
				Con:	Ability to influence manufacturer locating can have less to do with economics and more to do with location and markets

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Project Economics (cont.)	9	**Pre-Approve Wind Acquisition**	50	Pro:	May encourage utilities to develop more renewable resources due to reimbursement assurance
				Con:	Concerned about the need for greater specificity in this recommendation, as well as the very narrow application of 'pre-approval' to only wind-power projects. Perhaps the 'pre-approval', as is the case in the currently-pending legislation, should be considered for application to a range of energy projects so that all potential investments can be evaluated on equal footing in order to provide the greatest possible benefit to Idaho electricity consumers.
				Con:	State already has pre-approval process
				Con:	Would remove some performance risk from utilities
Siting and Permitting	1	**Define Wind as a Natural Resource**	56	Pro:	Definition will reduce siting and permitting challenges used by litigants to halt wind development
				Con:	Such a designation would not truly provide any benefit to the development of wind resources in Idaho.
				Con:	This option may not provide any benefit and may have unintended consequences, including tax/ownership issues
	2	**Develop a Transportation Guidebook**	54, 56	Pro:	Idaho citizens/businesses would benefit from uniform regulations, standards, and travel information such as height restrictions, bridge load capability, overpass clearances, alternative routes
	3	**Standardized Met Tower Permitting**	55	Pro:	Would simplify, standardize, and expedite permitting process, could include publicly available database
				Con:	Loss of local control
	4	**Standardize DEQ Hazmat Regulations**	54,55	Pro:	Would create a standardized, state-of-the-art list, streamlining permitting and identifying specific concerns
				Con:	Loss of local control
	5	**State Leads Environmental Permitting**	54, 56	Pro:	Takes control from the federal level and returns it to Idaho
				Pro:	May reduce or remove the current lengthy & costly federal permitting process as well as it's uncertainty
				Pro:	Allows affected Idaho state agencies to develop Idaho-based environmental priorities
				Con:	It might be difficult to usurp federal regulations and mandates

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Public Awareness	1	**Develop System to Refute Myths/Increase Public Knowledge**	57-60	Pro:	Education and correct public information about wind could reduce objections to projects
				Pro:	If wind information came from the state, it would be more credible and believable
				Con:	This system is already in place with the Communications Task Force of the ISEA
Transmission	1	**5-Year Payback to Developers**	10, 64-65, 70	Pro:	Would enable developers to finance transmission improvements
				Pro:	Would allow transmission owners to bring in wind related transmission
				Con:	Reduces risk to wind developers & improves their project economics by transferring the risk to utility customers
				Con:	Utilities already provide several different processes for developers (depending on the characteristics of each project) to secure interconnection and transmission service, including variability in the determination of the term of the repayment period for developers' network transmission investments.
				Con:	In the event a developer did not purchase transmission services over the term of the amortization, then utility customers would provide the financial backstop through an increase in their retail rates.
				Con:	Customers' interests are best protected when developers follow the FERC-established OATT process.
				Con:	If unregulated developers can recover transmission investment in five years, why shouldn't regulated utilities?
	2	**Fund Transmission Upgrades in Renewable Energy Zones**	10, 66	Pro:	Could lead to a more consolidated, efficient expansion of the grid
				Pro:	Could provide a forum for collaboration in identifying the best wind zones and associated transmission
				Con:	The benefit of promoting wind development in Idaho does not justify, in any way, the significant burden of investment as well as all of the risk of recovery for transmission that implementing this recommendation would place on our electricity customers.
				Con:	Why should retail electric customers subsidize unregulated developers of wind power?
				Con:	Potential to build transmission where wind ultimately is not built
				Con:	Retail electric customers subsidize unregulated developers of wind power

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Transmission (cont.)	3	**Transmission System Studies In IRPs**	64	Pro:	Could help insure that transmission is developed in the best locations for renewable resources
				Pro:	Could provide information regarding transmission costs to potential developers and the utility
				Pro:	Could allow more public input into transmission planning
				Con:	Develpers can get this information simply by making an interconnection request with the utility
				Con:	Complicates an already complicated IRP process
				Con:	Many transmission issues are more localized in nature and might not be picked up in detail in an IRP
				Con:	The IRP process may not provide the best forum for identifying transmission capacity available for interconnection
	4	**Create an Idaho Transmission Planning Group**	67, 70	Pro:	Provides a single location for transmission planning, promotion, permitting, developing incentives, participating in regional efforts, and identifying and addressing impacts in Idaho
				Con:	Transmission is a regional issue and cannot be adequately addressed by a state-specific group
				Con:	The activity of studying, investing in, and operating transmission infrastructure within a state, across a utility's control area, and ultimately, over the entire Western Interconnection, does not comport with the restriction of state boundaries.
				Con:	This is already being done on a regional scale, and Idaho is an engaged participant - no need for duplication
	5	**Fund IERA for Transmission**	69, 71	Pro:	May allow small developers access to low cost financing
				Con:	There is no need to provide any funding to the IERA until a developer requests it, i.e. a proven need
				Con:	If IERA funds transmission projects, Idaho taxpayers will ultimately bear the risks of recovering investments
	6	**Streamline Permitting & Right-of-Way**	69, 71	Pro:	Reduce project delays
				Pro:	May encourage additional new transmission lines to markets
				Con:	Loss of local control

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
PURPA (Qualifying Facilities)	1	**Streamline SAR/Update Frequently**	10, 75	Pro:	Better insures that the key variables used are as current and accurate as possible
				Con:	Might create greater volatility in PURPA rates, making it harder for developers to know what their PURPA rate will be
				Con:	Setting a long-term contract price that is equitable to consumers and developers in a dynamic market is challenging and is not adequately addressed in this report.
				Con:	Might place a greater burden on the IPUC staff
	2	**Require Performance Guarantees in PURPA**	10, 77	Pro:	Will provide assurance of performance to purchasing utility
				Pro:	Will prevent non-performing projects from tying up limited transmission capacity.
				Note:	It must be clearly understood that the termination rights are unilateral, and are held exclusively by the subject utility.
				Con	Potential to make PURPA rates less attractive, thereby reducing PURPA development
	3	**Increase Published PURPA Rate Eligibility to 20 aMW**	10, 76	Pro:	Would allow wind projects of up to 60 MW of nameplate capacity to be developed under PURPA rates, i.e., greater economies of scale
				Pro:	Potential for higher payments to wind
				Con:	The 10 MW limit was established to help small projects take advantage of avoided cost rates as a means to make these projects viable, not to benefit large projects that are already economically viable
				Con:	The economies of scale for projects > 10 MW provide for their economic viability in a competitive power market. It is burdensome and unfair to ratepayers to require them to pay a PURPA premium to purchase output from projects that are already competitive in open markets.
				Con:	Potential to harm competitive bidding where developers find PURPA rates are more lucrative when compared to bidding into utility requests for proposals. In essence, such a rule could set a floor on prices bid into utility RFPs
				Con:	The perception that this only benefit developers, not consumers

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Variability	1	**Encouraging Balancing Authority Pooling**	80, 83	Pro:	Sharing regulation resources region-wide should reduce the need for additional resources (and thus the cost) to integrate wind
				Pro:	Can shift the responsibilities of wind variation from one constrained system to one less constrained (dynamic scheduling)
				Con:	At what price should pooling and dynamic scheduling services be offered? Why is a utility able to provide these options at lower cost than merchants?
				Con:	Balancing authority pooling is not a state function. It belongs to utility authorities such as the Western Electric Coordinating Council and the Northwest Power Pool, and is a regional effort.
	2	**Northwest Ancillary Services Market**	82,83	Pro:	Provides a means for utilities to deal with the variability of wind and reduces wind integration costs
				Con:	This is already a dynamic and ongoing effort led by the region's utilities and other market participants.
				Con:	Development of these markets should be left to the purview of the utilities and related entities, not to the state.
	3	**Encourage Short-Term Spot Market**	82,83	Pro:	Provides a means for utilities to deal with the variability of wind and reduces wind integration costs
				Con:	This is not appropriately a state function. It belongs to utility authorities.
				Con:	What resources enable the State of Idaho to influence competitive markets with more skill than existing market forces?
				Con:	This is already a dynamic and ongoing effort led by the region's utilities and other market participants.
				Con:	Development of these markets should be left to the purview of the utilities and related entities, not to the state.
	4	**Value Geographic Diversity**	83	Pro:	Could encourage a more well-rounded decision in planning & procurement processes
	5	**Evaluate Demand-Side Management**	81, 83	Pro:	Load interruption programs could provide capacity for wind and its variability
				Con:	Very difficult and potentially expensive to implement, affecting ratepayers
				Con:	Identifying significant loads/customers that could be interrupted for extended periods of time seems unlikely
				Con:	Unlikely to significantly affect the supply of wind integration

Wind Task Force Options: Pros and Cons

Barrier Area	Recommendation Number	Recommendation	Page		Explanation
Variability (cont.)	6	**Time-of-Use Pricing**	81, 83	Pro:	May lead to less consumption over peak, freeing capacity for wind integration
				Pro:	Provides price signals to allow consumers some control over their consumption behavior, lowering their costs
				Con:	Not all consumers can modify their consumption patterns, so would be negatively impacted by this
				Con:	Unlikely to significantly affect the supply of wind integration
				Con:	The increased requirements related to metering, billing, and customer services could be prohibitively expensive
	7	**Fund Energy Storage R&D**	82,83	Pro:	Energy storage technologies have the potential to lower wind integration costs by managing its variability
				Con:	Energy storage is already being extensively funded at the federal level
				Con:	Storage technologies are very expensive and have a limited potential to promote wind generation in the future.

Idaho Strategic Energy Alliance

Wind Task Force
Initial Mandate
Response

Clint Kalich, Chair

February 1, 2009

Wind Task Force Membership

This report is the product of six in-person meetings by the 13-member Wind Task Force of the Idaho Strategic Energy Alliance. In addition to these, extensive work was completed via telephone and email correspondence. The task force is comprised of experts from academia, departments of Idaho State government, the Bonneville Power Administration ("BPA"), wind developers, and utilities. Membership and contact information are detailed below in Table 1.

Table 1 – Idaho Strategic Energy Alliance Wind Task Force Membership

Member	Organization	Contact	Member	Organization	Contact
Paul Clements	Rocky Mountain Power	Paul.Clements@PacifiCorp.com	**Brian Conrad**	John Deere Wind Energy	ConradBrianL@JohnDeere.com
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Idaho Strategic Energy Alliance

Wind Task Force

Executive Summary

Current Situation and Potential

Blessed with an abundant wind resource, Idaho has developed approximately one-half of one percent (146 MW) of its estimated potential; a significant share of the 25 x '25 goal could be met with wind generation ignoring other policy and cost considerations.[1] Current development levels disguise Idaho's plentiful resource. The state ranks 13th in the nation by this measure, with an estimated 25,000 megawatts ("MW").[2] To meet 25% of present and projected Idaho electricity consumption with wind would require the installation of approximately 2,500 MW, one-tenth of this potential, at a cost of $5 billion.[3]

Unfortunately, much of Idaho's wind lies at locations with marginal economics; by some measures Idaho needs could be met by Class 4 and higher ("good") sites. In the likely event that some of the estimated Class 4 and above sites were found to be unsuitable for development, remaining needs coming from wind would be met with resources classified by the May 2008 U.S. Department of Energy's 20% Wind Energy by 2030 ("20x30") study as "fair."

Idaho wind might not in all cases be financially competitive with neighboring states' resources using traditional evaluation techniques. Evaluating any resource solely on the basis of power cost can find the most economical sources are in neighboring states.[4] Wind generated in Idaho has the potential to be competitive with other states when full consideration is given to all of the economic benefits of wind, including: tax payments (3% of power sales revenue), job creation (25 jobs per 100 MW), landowner royalty payments ($2,667/MW-year) and related purchases in local communities in surrounding areas.[5] Idaho citizenry will benefit where each resource's full benefits are considered. Idaho utilities will require specific direction that in-state wind development is preferred, and that its societal benefits should be reflected in resource planning.

Barriers and Challenges to Development

Various barriers limit wind development in Idaho. Three stand out. The first is that most of the commercial transmission paths near wind development areas are mostly or fully subscribed,

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[1] The 25 x '25 goal, adopted by many states including Idaho, strives by 2025 that America's farms, ranches and forests will provide 25% of the total energy consumed in the United States, while continuing to produce safe, abundant and affordable food, feed and fiber. The Idaho Strategic Energy Alliance was formed to pursue the 25 x '25 goal. This report provides insights into how wind generation can help achieve the goal.

[2] "An Assessment of the Available Wind Land Area and Wind Energy Potential in the Contiguous United States," Elliott, Wendell, and Gower, 1991, a National Renewable Energy Lab report.

[3] This cost does not include major transmission infrastructure improvements that might be required at additional cost.

[4] Recent evidence of this result was the 2007 competitive acquisition of Horizon Energy's Elkhorn Valley Wind Project in northeastern Oregon.

[5] *"Economic Benefits, Carbon Dioxide (CO_2) Emissions Reductions, and Water Conservation Benefits from 1,000 Megawatts (MW) of New Wind Power In Idaho,"* U.S. Department of Energy, Energy Efficiency and Renewable Energy, 2008, http://www.nrel.gov/docs/fy09osti/44145.pdf.

limiting the ability to transport significant quantities of wind generation. A second barrier is the status and philosophies of the various utilities operating in Idaho. The state's three largest investor-owned utilities serve approximately 85% of Idaho's electricity requirements; each has a limited need for new wind generation. Avista presently has resources adequate to meet its obligations well into the next decade, limiting its appetite for new resources, wind or otherwise. Idaho Power has significant commitments to wind power that will enter service in the next few years. Rocky Mountain Power, with its large geographical footprint as a subsidiary of PacifiCorp, is developing resources outside of Idaho that have better wind profiles and are therefore more economical.

The third significant barrier to wind development in Idaho is its lack of large geographical areas with good or excellent wind resources. The 20x30 study classifies less than 4% of Idaho's wind resource as "excellent." A further 9% is classified as "good." The majority, 87%, is "fair." Absent large footprints of good or excellent wind resource, as in states like Montana and Wyoming, projects find it difficult to support both their installation costs and associated transmission infrastructure necessary to bring their power to market. Wind resources classified as "fair" have marginal economics even where local loads are available to consume the generated electricity.

Though greatly constrained by the three major barriers listed above, some projects in later development stages today might be able to overcome them. Other lesser barriers stand in the way of further development. The Wind Task Force grouped its 26 identified barriers into six categories. Table 2 summarizes the barriers. More detail may be found in the Barriers and Recommended Solutions section of this report.

Table 2 – Summary List of Barriers to Wind Development in Idaho

Barrier Area	Barrier	Barrier Area	Barrier
Project Economics	Lack of Markets for Wind Power	**Transmission**	Capital Intensity
	Utility Resource Plans Should Consider More Broadly Defined Wind Attributes		Access to Regional Transmission system
	The Additional Benefits of Wind Are Not Always Recognized		Timeliness of Transmission Modifications
	No Renewable Portfolio Standard		Lack of Information
	Idaho Wind Resource is Finite	**Variability**	Wind Resource are not Dispatchable
Siting and Permitting	General Policy Definitions		Lack of Dependable Capacity and Off-Peak Generation Bias
	Transportation Limitations		Poor Wind Forecasting
	Met Tower Permitting	**Stakeholder Outreach**	Wind is Noisy
	Hazmat Requirements		Wind Kills Many Bats and Birds
	Inaction on Environmental Permitting		Wind is Unreliable
PURPA	Calculation of Avoided Cost Prices		Wind is Costly and Subsidized
	Rate Uncertainty/Availability		Wind Reduces Property Values
	Inadequate Termination Provisions		Wind Burdens County Governments

Options for Development and Highlighted Recommendations

Though it is unrealistic to provide incentives to make all potential wind sites viable, certain actions can be taken to move the better sites forward. The Wind Task Force identified 31 options it believes have the potential to enhance development at these sites in Idaho. Eleven were identified as having the most impact and are briefly described here. A table of all of the options follows. Full discussions of each recommendation are contained in the Barriers and Recommended Solutions section at the end of this report.

Highlighted Recommendation Area 1 – Project Economics

The Wind Task Force made nine recommendations to address barriers in the Project Economics category; three are highlighted here as having the greatest potential for moving wind projects forward in Idaho.

Recommendation 1 – Provide Transferrable State Tax Credit Incentives

Idaho could institute a transferable investment tax credit for renewable energy business at a level greater than the existing 3% business investment tax credit. To determine the parameters of the credit, Idaho could initiate an economic analysis, possibly performed by the Idaho Center for Advanced Energy Studies, to ensure the tax credit suits the state's growth goals.

Recommendation 2 – Create an Idaho Energy Trust

Idaho could create a modest energy trust fund by applying a small surcharge on consumer energy rates in the range of 0.05 cents per KWh. The trust could then fund efforts in support of renewable energy development such as infrastructure and renewable energy-based economic development. The trust could be administered within existing state agencies to avoid the creation of an additional bureaucracy.

Recommendation 3 – Provide a Credit Backstop to Facilitate IERA Project Financing

Idaho could direct the Idaho Energy Resources Authority to partner with the Idaho State Treasurer and Idaho Office of Energy Resources and apply for $100 million of federal funding for renewable energy and its supporting infrastructure development. The funds, if granted, could be deposited by the state treasurer in an account used to collateralize (backstop) bonds sold to finance developers with modest balance sheets who otherwise might struggle to obtain low-cost funding. The state treasurer could then become the purchaser of the bonds. As the bonds are retired, the funds could be re-invested in other renewable energy and infrastructure projects.

Highlighted Recommendation Area 2 – Transmission

The Wind Task Force made six recommendations to address barriers in the Transmission category. Two are highlighted here.

Recommendation 1 – Provide 5-Year Paybacks to Wind Developers for Transmission Upgrades

A collaborative effort by utilities, wind developers, other interested stakeholders, and the IPUC could be convened to identify a means of reimbursing wind developers for transmission infrastructure upgrades over a 5-year period. This shorter refund period would better enable wind developers to finance transmission improvements while enabling transmission owners a means to bring such upgrades into their asset base over time.

Recommendation 2 – Utilities Should Fund Transmission Upgrades in Renewable Energy Zones

Idaho could develop a collaborative process, patterned after work by the Western Governors' Association and the states of California and Texas, to identify renewable energy zones and develop transmission infrastructure plans to enable wind development in the state.[6] Electric utilities could offer incentives, including paying all or part of the transmission upgrade costs necessary to enable wind development in the identified renewable energy zones.

Highlighted Recommendation Area 3 – Public Utility Regulatory Policy Act of 1978 ("PURPA")

The Wind Task Force made three recommendations to address barriers in the PURPA category. The task force considers each essential to moving wind forward in Idaho.

Recommendation 1 – Streamline the SAR Process and Update Regularly

Idaho could recommend that the Idaho Public Utilities Commission ("IPUC"), in conjunction with its regulated utilities, resource developers, and other interested parties, explore ways to streamline avoided cost calculations. The key variables, including natural gas, could be updated on an annual basis using the best information available at that time.

Recommendation 2 – Require Performance Guarantees in All PURPA Contracts

Idaho could recommend that the IPUC require termination provisions in all PURPA contracts signed by its regulated utilities. Such provisions would include performance guarantees backed, in cases where the wind developer does not have the financial means to cover their obligations in the event of project default, by letters of credit or other provisions.

Recommendation 3 — Increase Published Rate-Eligible PURPA Projects Limit to 20 aMW

Idaho could direct the IPUC to increase PURPA SAR published rate pricing eligibility from 10 aMW to 20 aMW. Increasing this limit would enable projects of up to approximately 60 MW of nameplate capacity to be constructed, thereby providing better economies of scale for developers.

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[6] Western Renewable Energy Zones, Western Governors Association in conjunction with U.S. Department of Energy: http://www.westgov.org/wga/initiatives/wrez/

Highlighted Recommendation Area 4 – Variability

The Wind Task Force made seven recommendations to address barriers in the Variability category. The task force wishes to highlight three here.

Recommendation 1 – Encourage Balancing Authority Pooling

Idaho, through the IPUC, could encourage its regulated utilities to pool their resources and use dynamic scheduling options to lower wind integration costs.

Recommendation 2 — Encourage Northwest Ancillary Services Markets

Idaho could encourage its electricity utilities to participate in regional efforts to help form a Northwest capacity and ancillary services market.

Recommendation 3 — Encourage a Short-Term Spot Market for Power

Idaho could encourage its electricity utilities to participate in regional efforts to help form an electricity spot market trading in time intervals of five or ten minutes.

Complete List of Recommendations

Table 3 is a complete list of Wind Task Force recommendations. Each is discussed in the Barriers and Recommended Solutions section later in this report.

Table 3 – Complete List of Wind Task Force Recommendations

Barrier Area	Recommendation	Barrier Area	Recommendation
Project Economics	Offer Green Power Rates State-Wide	**Transmission**	Transmission System Studies
	Increase Net Metering Caps		5-Year Payback to Developers
	Revisit Externalities in IRPs		Renewable Energy Zones
	Make Tax Credits Transferrable		Create an Idaho Transmission Planning Group
	Create an Idaho Energy Trust		Fund IERA for Transmission
	Provide Credit Backstop to IERA		Streamline Permitting & Right-of-Way
	Fund IERA for Renewables	**Variability**	Encourage Balancing Authority Pooling
	Fund Wind Manufacturing Initiative		Value Geographical Diversity
	Pre-Approve Wind Acquisition		Evaluate Demand-Side Management
Siting and Permitting	Define Wind as Natural Resource		Evaluate Time-of-Use Pricing
	Develop Transportation Guidebook		Energy Storage R&D
	Standardized Met Tower Permitting		Northwest Ancillary Services Market
	Standardize Hazmat Regulations		Support Short-Term Spot Markets
	State Leads Environmental Permitting	**Stakeholder Outreach**	Develop System to Refute Myths and Increase Public Understanding of Wind Issues
PURPA	Streamline SAR/Update Frequently		
	Performance Guarantees in PURPA		
	Published Rate Eligibility to 20 aMW		

Idaho Strategic Energy Alliance

Wind Task Force

State of Wind Development in Idaho

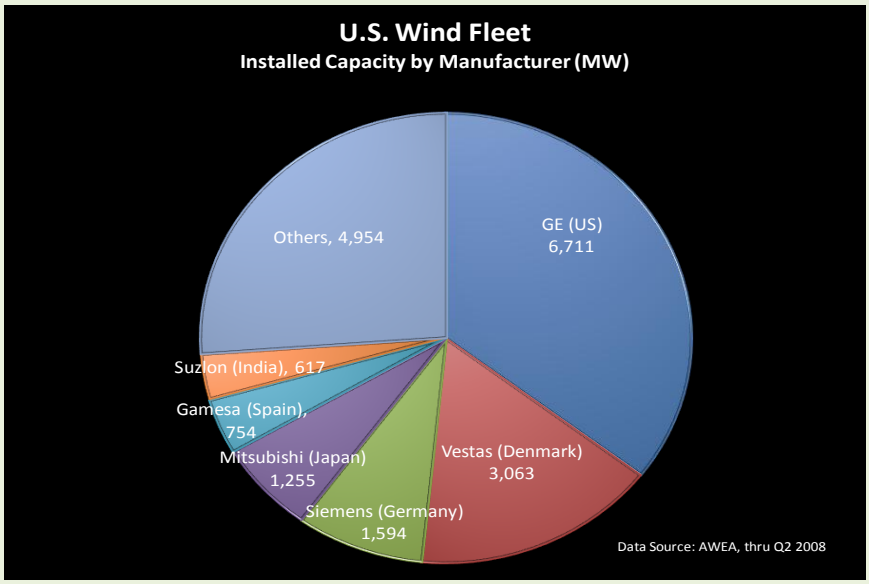
The State of Wind Development in Idaho

Much of the experience and state of wind development have occurred outside of Idaho. Information in this section is therefore broken down between international, national, and Idaho experience sequentially.

An International Perspective

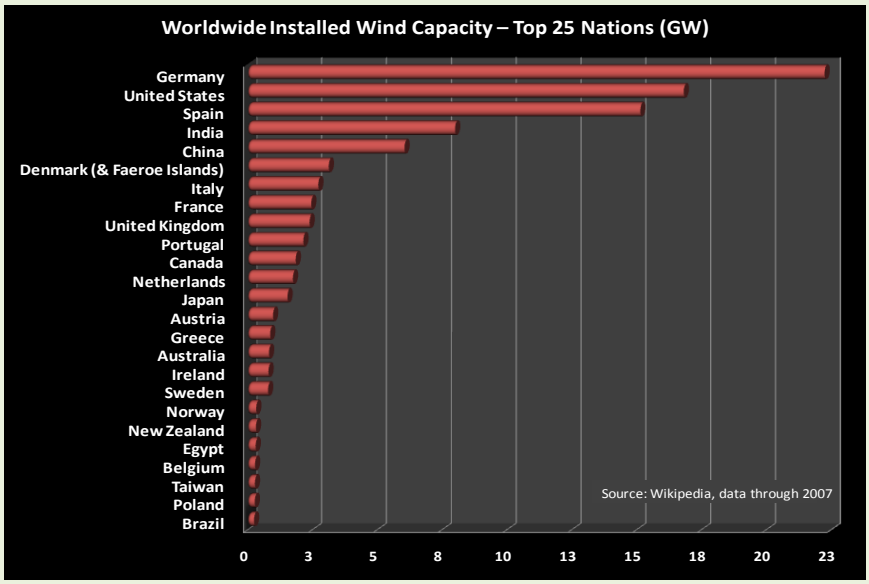
Wind energy development is an international business. Across the globe countries are striving to generate more of their electrical energy from renewable resources. Several firms developing wind energy in the United States do the same in other parts of the world. Additionally, many wind turbines being installed in the United States are not manufactured here. Instead, they are produced in other parts of the world including Europe, India and China. Chart 1 details wind turbine installations in the United States by manufacturer from 2003 through 2007. As wind turbine components are sourced throughout the world, and most manufacturers have multiple regional offices, only corporate headquarters locations are noted.

Figure 1 — U.S. Wind Fleet by Turbine Manufacturer



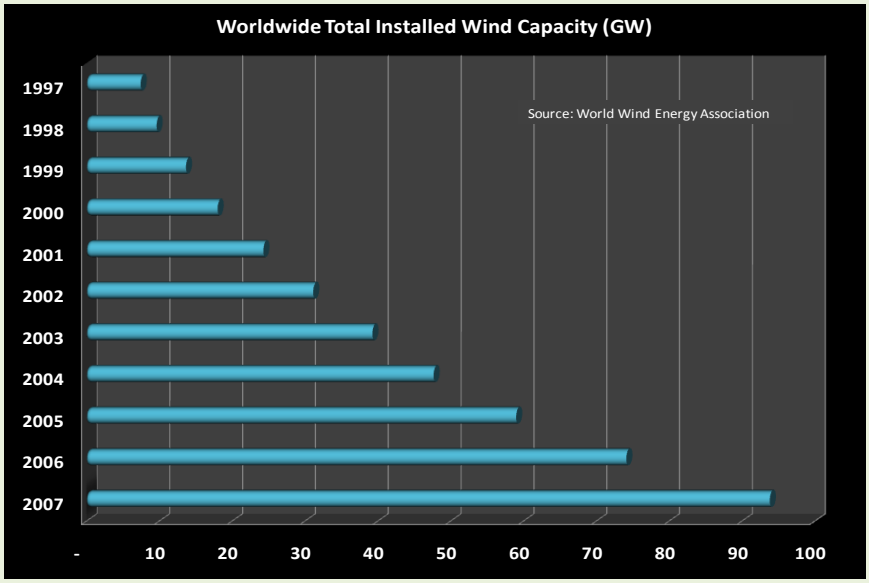
Excluding development that occurred in California in the 1980s, the United States lagged many European nations in the development of wind generation well into the middle of this decade. Only as recently as 2005 did our nation become the largest installer of wind generation capacity, a position it has held since that time. Today we represent approximately 20% of total worldwide wind capacity. Figure 2 presents total installed wind capacity by nation at the end of 2007. It is estimated that the United States moved ahead of Germany in 2008 as having the largest installed wind fleet.

Figure 2 – Worldwide Installed Wind Capacity by Nation



Nearly 20,000 MW of new wind capacity were added worldwide in 2007, on top of more than 15,000 in 2006. Total installed wind through the end of calendar year 2007 was approximately 94,000 MW. Figure 3 shows total worldwide installed wind capacity by year starting in 1997.

Figure 3 – Worldwide Total Installed Wind Capacity by Year (Cumulative)

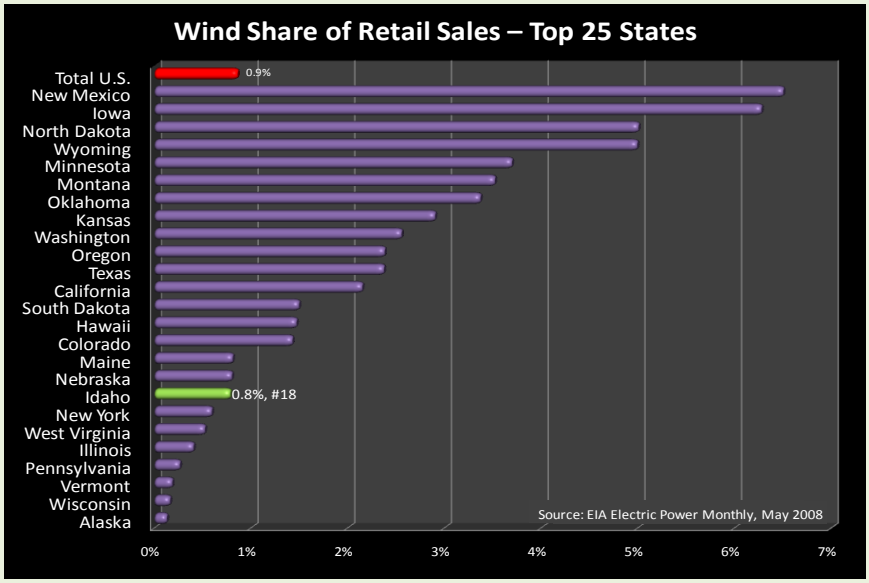


National and Idaho State Perspectives

As of 2007 approximately 0.9% of retail electricity sales were supplied by wind energy in the United States. Idaho, eighteenth in the national order of sales met by wind energy, serves

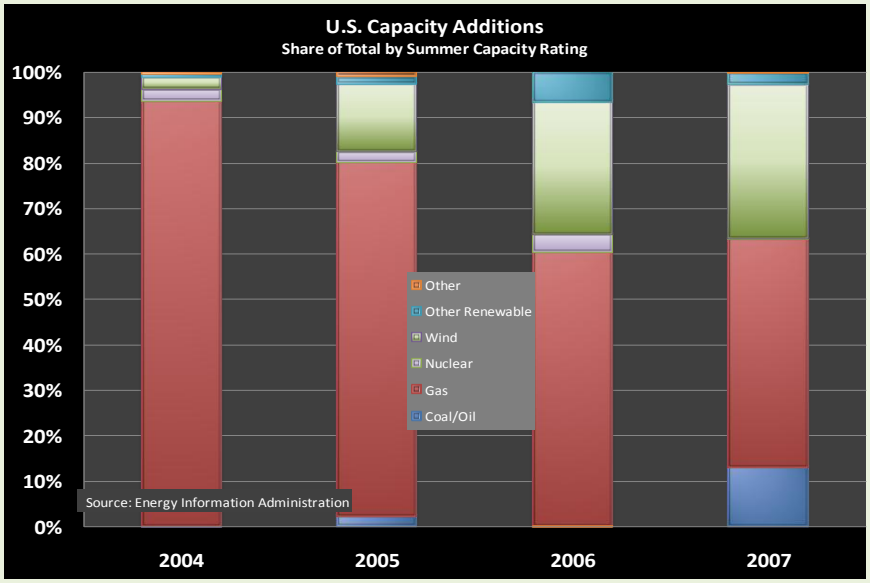
nearly the same percentage: 0.8%. Both New Mexico and Iowa, two states with the largest share of wind relative to retail load, serve more than 6%. See Figure 4.

Figure 4 – Wind Energy Share of Retail Sales by State



Wind generation is now a major component of new generation capacity in the United States. As recently as 2004 wind barely showed up; it comprised over one-third of the total in 2007. See Figure 5.

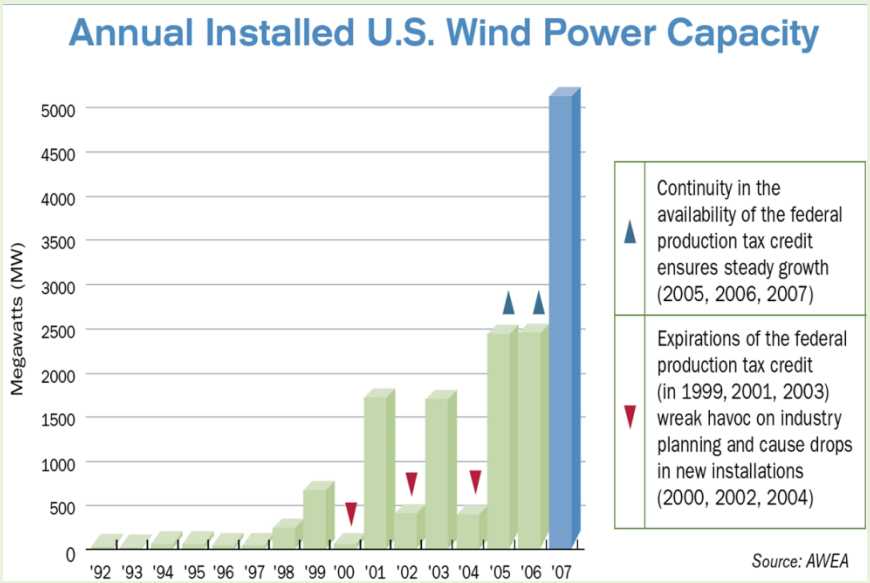
Figure 5 – Wind Capacity Share of U.S. Capacity Additions, 2004 through 2007



Tax incentives greatly affect wind development. Wind project construction continued at a modest pace until 1999, whereby it took off in years where the federal government provided

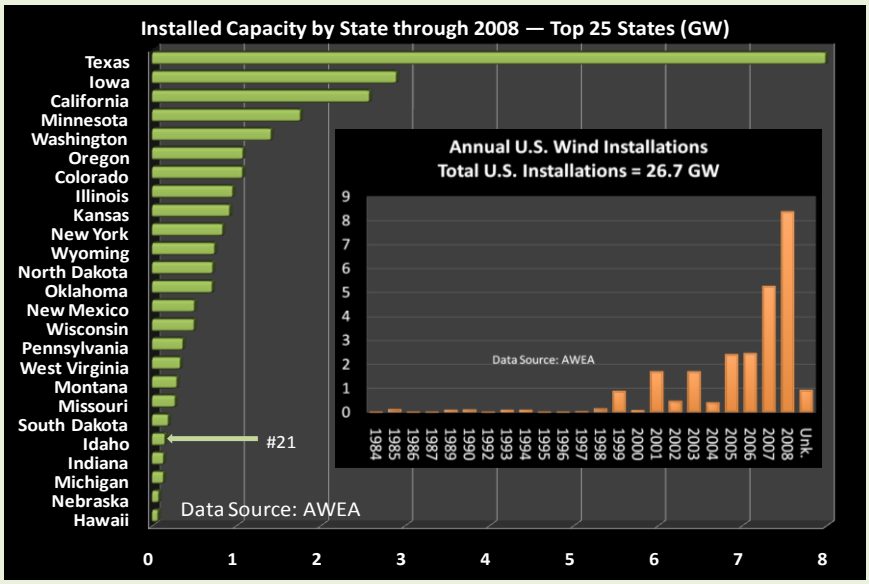
tax incentives for its construction. Figure 6 from the American Wind Energy Association ("AWEA") explains how today's wind fleet came into being. It also provides an indication of how preferential tax treatment for the resource greatly affects installations, and could indicate how favorable treatment in Idaho would spur further investment.

Figure 6 – U.S. Wind Power Installations and Availability of Federal Production Credits



Retail sales supplied by wind, as presented in Figure 4, do not explain the whole story of wind development because some states (e.g., California) have very large retail loads relative to their installed wind capacity base. Figure 7 explains that although California is 12th by measure of retail sales served by wind, its installed wind capacity base is a much more impressive second. Texas ranks first by a wide margin, with 5,300 MW through 2007. Idaho was 20th in the nation in 2007, with 75 MW of installed capacity at that time. The figure includes an inlay showing annual wind installations across the U.S. from 1984 to 2008.

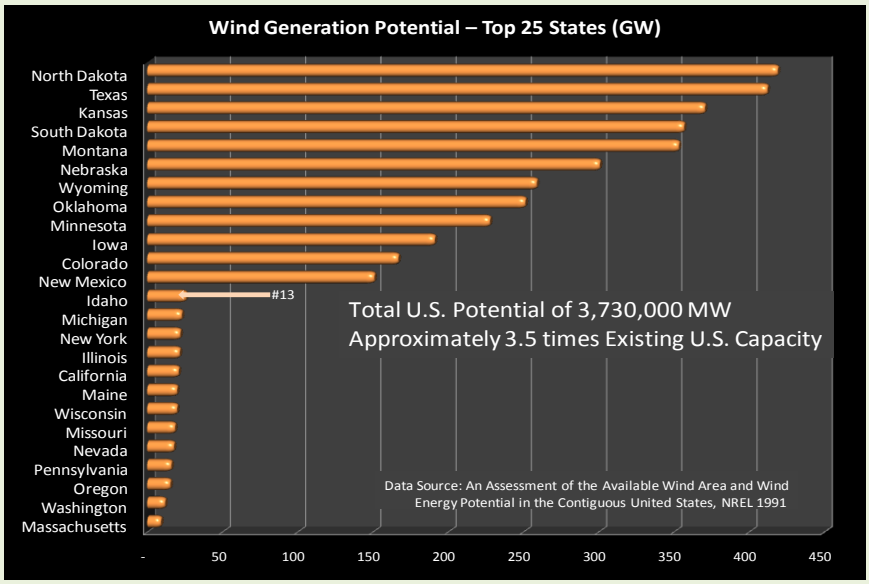
Figure 7 – Installed Wind Capacity by State (2007)



According to a regularly cited 1991 Pacific Northwest National Laboratory ("PNNL") study, the United States has the potential to develop more than 3,700 gigawatts of wind capacity.[7] This amount is equivalent to approximately 3.5 times the entire electricity generating capacity of the United States today. Though the figure includes resource potential that ultimately will not be developed due to various considerations including economics and load center proximity, the "20x30" study explains that only 10% of this estimated potential would need to be developed by 2030 where average capacity factors reach 33%. Figure 8 provides a summary of wind potential by state; Idaho ranks 13th in the nation by this measure.

[7] "An Assessment of the Available Wind Land Area and Wind Energy Potential in the Contiguous United States," Elliott, Wendell, and Gower, 1991.

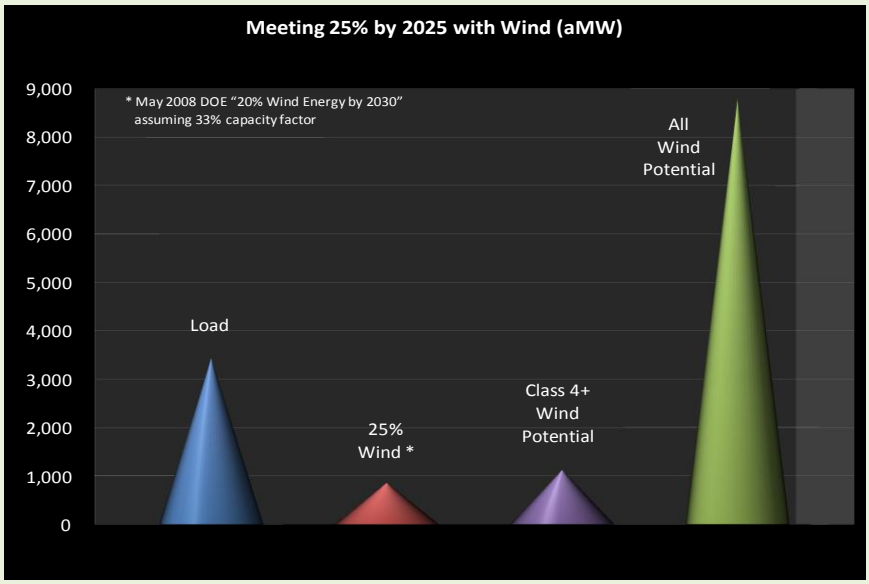
Figure 8 – State Wind Generation Potential



Observations and Learned Lessons

Wind is generally touted as the only commercially-available technology with the potential to significantly impact new renewable portfolio goals and requirements. Figure 9 provides an estimate of the 25% Idaho retail load requirement in 2025, and the equivalent amount of wind generation capacity that would be necessary to meet it were wind the only resource under consideration. It also shows how much potential there is for “high-quality” wind sites of Class 4 or higher and the total potential in the state according to the 20x30 report. As the comparison shows, acquiring 25% of Idaho’s electrical energy from wind would require approximately all of the state’s high-potential sites assuming the full estimated quantity ultimately is determined to be favorable to development. Given Idaho’s wind profile, it will likely require a combination of wind and other renewable resources in order to meet the goal of 25% renewable resource development by 2025. This matches the objectives of the Idaho Strategic Energy Alliance in promoting a diverse energy portfolio for the state.

Figure 9 – Meeting 25 x '25 with Wind Resources in Idaho



Idaho Strategic Energy Alliance

Wind Task Force

Developers Presently Operating in Idaho

The State of Wind Development in Idaho

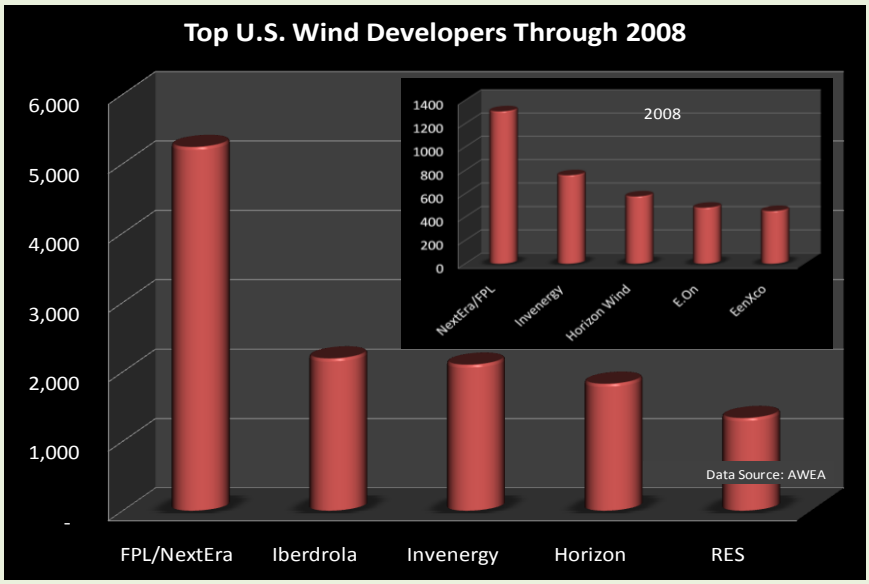
Many developers with varying levels of experience operate in Idaho. The state is fortunate in that it has many developers working its lands who have the capability to develop wind projects; a sampling of the players is presented in Table 4.

Table 4 – A Sampling of Wind Developers in Idaho

Energy Vision	RES-North America
Exergy	Ridgeline Energy
GreenWind Energy	Transalta
Invenergy	Windland
John Deere Wind Energy	

There are many developers in Idaho; however, only one (RES-North America) of the top 5 U.S. developers is active in the state. Figure 10 details top developers.

Figure 10 – Top U.S. Wind Developers, 2003-2007



Idaho Wind Developments

Through early 2009, total wind generating capacity constructed in Idaho is approximately 146.4 MW. Of that, 81.9 MW (56%) were developed under PURPA laws and 64.5 MW (44%) were developed as part of a contract negotiated directly with Rocky Mountain Power. Table 5 details wind development in Idaho.

Table 5 – Total Wind Development in Idaho

Year	Project Name	Type	MW
2004	Fossil Gulch	PURPA	10.5
2006	Wolverine Creek	Negotiated	64.5
2008	Hot Springs & Bennett Creek	PURPA	42.0
2009	Cassia & Cassia Gulch	PURPA	29.4
		Total	**146.4**

Idaho PURPA Developments

Through early 2009, PURPA development has brought 90.9 megawatts of wind generation to Idaho, including a 9-MW project located in Montana being purchased by Idaho Power. Only one non-PURPA commercial-scale development has entered service, and no contracts presently are at late stages of negotiation, except under PURPA. No new PURPA contracts have been signed since 2006, likely in large part to the greatly rising cost of wind turbine equipment relative to the change in PURPA rates available to developers. The following table describes PURPA development in Idaho through early 2009.

Table 6 – PURPA Wind in Idaho

Year	Signed MW	On-Line MW	Year	Signed MW	On-Line MW
2002	0.4	0.0	2006	109.0	9.0
2003	0.0	0.0	2007	0.0	0.0
2004	19.5	10.5	2008	0.0	42.0
2005	138.0	0.0	2009	0.0	29.4
			Total	**266.5**	**90.9**

Idaho Strategic Energy Alliance

Wind Task Force

Wind Development Opportunities

Wind Development Opportunities

Estimating wind potential in Idaho is neither simple nor a science. A 1991 PNNL study estimates Idaho's potential at 73 billion kilowatt-hours, or 25,000 MW assuming a 33% average capacity factor. Through early 2009, Idaho had installed 146 MW of wind generation, or 0.6% of the PNNL estimate.

The recent federal 20x30 study used an updated calculation for Idaho of 26,550 MW; it explained that 87% of identified wind potential is "Class 3," a wind resource that today provides marginal project economics. Idaho's potential from the study, broken down by class rating, is shown below in Table 6. AWS Truewind classifications are provided as a reference of how good the wind resource is at each rating.

Table 7 – 20x30 Estimates of Wind Potential in Idaho

Rating	Potential (MW)	AWS Classification	Share of Total
Class 3	23,875	fair	87.2%
Class 4	2,275	good	8.9%
Class 5	635	excellent	2.4%
Class 6 & up	395	outstanding	1.5%

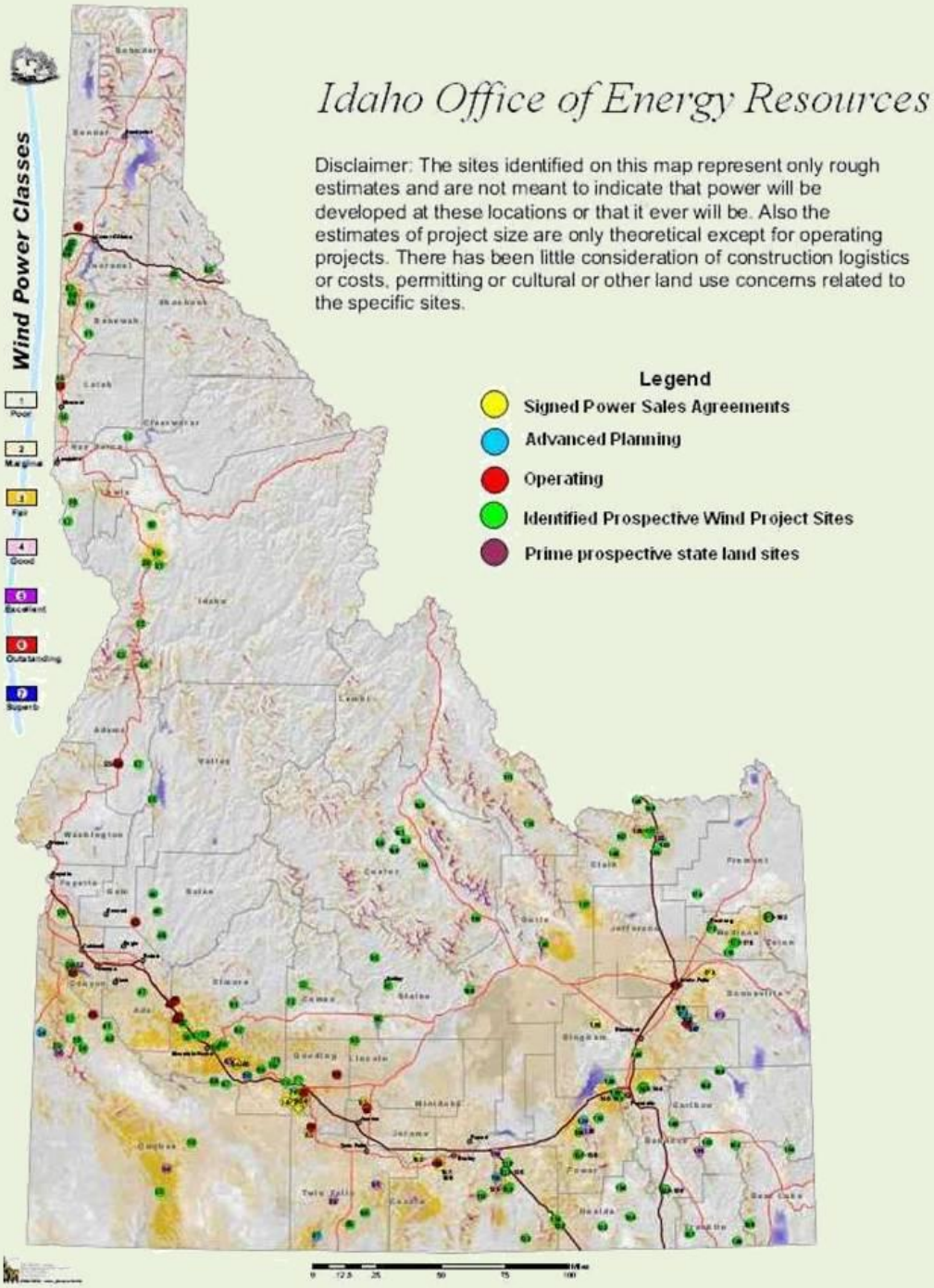
Another look at wind potential is a map put together by Gerald Fleischman at the Idaho Office of Energy Resources ("IOER"). The map identifies wind projects at various stages of development gleaned from press releases, news reports, and personal contacts. In total 162 projects are on the list, equating to approximately 16,694 MW of wind capacity. Table 7 details projects by their development stage. Notice that of the 192 projects, 23 are operating and an additional twelve have agreements to sell their resource output. Only 2% of the estimated capacity is in these final stages, and 89% are in what Mr. Fleischman terms as "preliminary" stages.

Table 8 – IOER Wind Potential Tabulation

Stage	Count	MW	Share of Total	Average Size (MW)
Preliminary	149	14,922	89%	100
Advanced	8	1,447	9%	181
w/Agreements	12	178	1%	15
Operating	23	146	1%	6
Total	192	16,692	100%	97

The IOER has prepared a state map showing where the resources summarized in Table 7 are located. Figure 11 is a September 2008 rendition of the map.

Figure 11 – IOER Wind Potential Map



Much of the wind resource being developed in Idaho today, and likely into the near future, is situated along the Snake River plain in southern Idaho. While capacity factors range from 30% to 40% in this area, Table 6 would indicate that most Idaho wind is Class 3 and that the average capacity factor of a broad Idaho wind resource will be closer to the lower end of this range.

Idaho retains wind development sites that alone have the potential to equal or exceed Idaho's present wind fleet. Sites exceeding 100 MW include Cotterell being developed by Windland, China Mountain being developed by RES-North America, and Goshen South being developed by Ridgeline Energy. In total these projects exceed 500 MW.

Likelihood of Bringing Wind to Market Under Current Conditions

Idaho's wind potential and small wind fleet might be indicative of the future of large wind development occurring in the state absent policy changes. The state's share of good wind sites is modest relative to neighboring states and tax incentives for wind power are small. There also is no renewable energy portfolio standard ("RPS") spurring development, though action at the federal level might affect the state's need for wind and other renewable resources. Idaho's total energy demand is small when compared to neighboring states, meaning that large in-state developments will need to overcome the additional costs of transmitting power outside of the state for sale to other customers. On top of policy differences, wind turbine prices have skyrocketed in recent years as worldwide demand has exceeded supply. Wind projects being offered to utilities today are nearly 3 times the price of only 5 years ago. The challenge of expanding wind development in Idaho therefore is no small task.

Idaho Strategic Energy Alliance

Wind Task Force

Integration of Wind with Other Renewables, Traditional Resources, and Conservation

Integration of Wind with Other Resources

The benefits of wind generation bring with them challenging operational issues being addressed today. Traditional and other renewable resources, conservation, and demand-side options will play a part in absorbing more wind variability on the Idaho electric system. One interesting result is that utilities, regulators, and policymakers will need to recognize the benefits of having more flexibility when planning for non-wind resources. Due to the variable operating characteristics of wind, non-wind generation is needed to maintain system reliability when winds are low or not blowing. In addition, operating reserves, transmission planning, and system and market operations must be managed to mitigate the impacts of integrating wind resources.[8]

Traditional Resources

Wind relies on other system generation resources because of its inherent variability. Studies by the three investor-owned electric utilities have shown that significant levels of wind capacity can be integrated reliably but at a cost. A mix of hydroelectricity and thermal resources can be used to account for the variability of wind generation. In the case of hydroelectricity, energy can be stored in a reservoir when the wind is blowing and utilized at a later time when the wind is not blowing. It should be noted that in Idaho most hydro resources are run-of-river and do not have significant reservoir storage capabilities. In addition, due to requirements on existing reservoirs for fish passage, recreation, flow regulations, and other requirements, existing reservoirs may not always be available for mitigating wind variability. For natural gas, energy can be stored by backing down the generator and burning less gas. Since fuel is the largest cost of generating electricity in gas turbines, saving fuel when wind-energy is present can be cost-effective.

Other Renewable Resources, Conservation and Energy Efficiency

Non-wind renewable resources and conservation might have the ability to integrate wind power. But using these resources can be more costly than the traditional options listed above. This is because unlike resources requiring the provision of expensive fuel, most renewable energy facilities have low or no fuel costs. For example, a geothermal power plant can be backed down in periods of good wind. However, the cost of its generated electricity rises because it produces fewer kWh over which upfront capital costs may be recovered. In the case of conservation, the most obvious way it can be used to help integrate a wind resource is by increasing consumption when the wind is blowing. Not only does this run counter to the goal of conservation, it may be difficult to find large loads (e.g., industry or agriculture) with the flexibility to ramp up consumption when the wind is blowing.

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[8] "*Integrating Wind Generation Into Utility Systems*", Charlie Smith, Edgar Demeo, & Sandy Smith. North American Windpower. September 2006. www.nawindpower.com

Idaho Strategic Energy Alliance

Wind Task Force

State of Wind Generation Technology

The State of Wind Generation Technology

Wind is a maturing technology, having grown from small turbines with capacities well below 100 kW, 15-meter rotor diameters, and 35 meter towers in the 1980's to today's massive multi-megawatt machines sitting atop 100 meter towers with equivalent blade diameters. As recently as 1999 sub-MW class turbines were installed in massive arrays (e.g., the 300 MW Stateline project in Washington State). No large project today likely would consider units sized below 1.5 MW. State-of-the-art technologies exist in every turbine classification, from small homeowner units up to massive 5 MW off-shore units. The larger units by themselves no longer compromise system reliability as they used to, in that they have low-voltage ride through and VAR support technologies.

Example Benchmark Projects

One might look to the 146 MW of existing projects in Idaho as benchmarks, but given that many of these are small developments entering service through PURPA contracts, they might not be the best examples of what Idaho might experience in a future made more favorable for wind development.

Next Generation Technologies, Research Work, and Funding for Advancements in Wind Generation

Wind energy is related to the cube of wind speed; that means that if wind speeds double, the energy within it increases by a factor of eight. Energy captured by wind turbines is directly proportional to the area intercepted by their blades; as such, larger rotor diameters are beneficial. Greater efficiencies will therefore be gained by erecting towers higher in the air and attaching to them turbines turned by longer blades. The biggest trends in wind technology are addressing these factors directly. Unfortunately, the industry has reached a point where transportation, weight, and erection might prevent significant further gains–at least in land-based installations–unless new technologies are employed.

Large turbine towers are tubular structures that must become larger in diameter to support taller and heavier wind turbines. Towers can only be so large before one cannot transport them from port to their ultimate destination. Already many towers cannot be shipped via rail due to their diameter. New technology will need to be employed to improve structural strength so that turbines can be extended further into the air and support more weight without increasing tower diameters.

Blades, too, are approaching their limits using existing technologies. Longer blades capture more wind in lower-classed wind areas, making previously marginal wind sites cost-effective. But as blades become longer the stresses they endure increase greatly. Even today's wind technologies suffer in some cases from blade problems. One recent example was a wholesale replacement of blades being used on newer Suzlon turbines, the same turbines installed at all

Idaho projects since 2006. Blades likely will need to shift away from construction using balsa wood and fiberglass towards advanced composite materials. The good news for blades is that advanced composite technology can be based on well-understood designs adapted from the aeronautics field. Airplane manufacturers have been using composites for years and the wind industry should be able to follow suit, albeit possibly at the disadvantage of higher blade material and manufacturing costs.

Idaho Strategic Energy Alliance

Wind Task Force

Early Wind “Wins” for Meeting 25 x ’25

Early Wins for Wind in Idaho

As explained above, there are a number of projects in the state that are in the later stages of development. Many smaller projects presently are under contract with Idaho Power but due to various challenges (e.g., rising projects costs, transmission) they have not yet delivered on their commitments. It likely would take better project economics to move these projects from the drawing board to the electric system. IOER indicates that as much as 1,500 MW of new wind projects could enter commercial service in the next few years were conditions right. While this estimate is likely optimistic, combined with existing projects serving Idaho today these new wind plants alone would bring total state retail electricity sales served by wind projects to nearly 20%.

Idaho Strategic Energy Alliance

Wind Task Force

Idaho Energy Security

Promoting Energy Security with Wind Power

Wind power can enhance Idaho energy security by reducing its electricity imports. In-state projects and associated manufacturing provide opportunities for improving economic conditions in the state. Wind generators create electrical energy without the environmental impacts associated with traditional resources.

Economic stability

Green energy jobs (construction, operation, manufacturing) in Idaho will stimulus and security to its citizens. Wind generation, and many renewable energy projects in general, have low or no fuel costs, meaning that trends in the commodities market do not greatly affect production costs. Rising cost environments similar to what we are experiencing today will not affect greatly projects already in service, though we have seen that such conditions do have the potential to greatly impact the upfront capital costs of wind.

Utility companies typically acquire energy two ways: utility-owned facilities or short- and long-term power purchase agreements.[9] There is some disagreement about the value of energy not produced by utility generators, such as that acquired through power purchase agreements. While power purchase agreements can shift short- to intermediate-term risks away from utilities and their ratepayers, it is unclear what happens to these resources once their initial contract term expires. No guarantee exists to ensure that a project's energy, in most all instances owned by entities outside of Idaho and even the United States, will remain in the state after the expiration of the power purchase agreement. It also is very likely that, unlike utility-owned generation, the prices for wind project output after the initial power purchase agreement term expiration will rise greatly, as market prices are likely to rise over the course of the contract. Facilities owned by utility companies, on the other hand, can generate very low-cost electricity after they have been fully depreciated.

Resource preservation

Wind, through lease payments and local and state taxes, helps support rural land economies. New roads, better public services (e.g., fire and policing), and lower taxes for residents are all benefits of large wind generation investments. Wind development can also protect sensitive habitat that might otherwise be adversely affected by other developmental uses. A typical wind project consumes less than one acre per turbine. For a 100 MW wind project on 10,000 acres, this means that wind can help protect 99.9% of the habitat.

[9] PURPA contracts are a form of power purchase agreement.

Environmental sustainability

As explained earlier in this report, wind energy has low environmental impacts relative to traditional resource technologies. It does not emit any air pollutants into the environment or consume precious water resources.

Idaho Strategic Energy Alliance

Wind Task Force

Barriers and
Recommended Solutions

Project Economics

Electricity rates in Idaho have historically been among the lowest in the nation. This is due in large part to the extensive system of hydroelectricity facilities in Idaho, but it is also due to imported electricity generated in coal-fired plants outside of the state. It is unlikely that any new generating facility will be able to produce electricity at rates comparable to today's embedded costs. New electricity generation facilities are instead judged relative to each other on a cost basis. Costs associated with electricity generated by any new facility, be it coal, natural gas, wind, geothermal, or another technology, are increasing. The main drivers of increased costs are: a weak dollar relative to the currencies of those countries manufacturing wind turbine components; increased raw materials costs; and supply chain shortages created by increased demand.[10]

Proposed wind power facilities in Idaho will be compared not only to other resources, but also to electricity that can be purchased from out-of-state projects and imported via transmission lines. Cost comparisons must be based on an appropriate method, depending on the context. For example, examination of first-time installed cost might disadvantage wind relative to gas-fired technologies; examining total life-cycle cost will show wind generation to be much more cost-competitive.

The following sections will address project economics in greater detail and offer possible actions the state of Idaho may pursue to address them.

Barriers to Making Wind Projects Viable in Idaho

Economics Barrier 1 — Lack of Markets for Wind Power

Though growing, Idaho is a relatively small market for electricity when compared to more populous states located to its south and west. To date wind developers have been fighting for pieces of a relatively small pie. Idaho Power already has contracts in place for 351 MW of wind generation.[11] Rocky Mountain Power purchases wind from projects in southeast Idaho, but it has access to better wind resources in Wyoming. Avista is physically disconnected from Idaho's best wind resource—the Snake River Plain. Without markets in which to sell electricity, options to develop Idaho's wind resource become limited. This picture might change with the addition of new power transmission projects scheduled for completion within the next three to five years. The Southwest Intertie and Gateway West projects, when completed, have the potential to allow Idaho to export its wind-generated electricity.

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[10] *Will Wind Power Remain Competitive?*, Ric O'Conell, Black & Veatch, presented at Windpower 2008; since this publication the U.S. dollar has appreciated against the Euro Zone where many wind components are manufactured.

[11] There is some uncertainty regarding the amount of PURPA wind under contract that will actually be constructed.

Economics Barrier 2 — Utility Resource Plans Should Consider More Broadly Defined Wind Attributes

Regulated electricity utility companies are required to update and file biennial Integrated Resource Plans ("IRPs") to the Idaho Public Utility Commission ("IPUC") identifying sufficient resources to meet expected demand over the ensuing twenty-year period. The IRP process might not properly value wind energy in the context of overall societal benefit, including those benefits beyond traditional energy and capacity cost calculations.[12] To the extent that wind generation is undervalued in the IRP process, fewer wind resources are targeted by utilities.

Economics Barrier 3 —The Additional Benefits of Wind Are Not Always Recognized

In addition to providing low-cost energy, in-state wind development brings other benefits to the state. By developing in-state projects, new jobs–both temporary and permanent–are created. Most of these jobs are in rural areas desperate for them. Wind energy is responsible for creating far fewer carbon dioxide ("CO_2") and other pollutant emissions than traditional fossil fuel-fired generation sources. Increasing wind energy penetration rather than adding more traditional generation resources will have the effect of reducing Idaho's total CO_2 emissions while emitting no mercury, sulfur, carbon monoxide, volatile compounds, or particulate matter. Wind generation consumes no water in its generation process, unlike coal and gas-fired plants that can consume millions of gallons of water daily. Wind facilities also carry no fuel price risk, leading to more stable prices for utilities and their ratepayers, especially when compared to today's other popular resource—gas-fired generation. Finally, by developing in-state wind projects, counties' tax revenues will increase, often substantially, giving them a stronger financial base from which to provide public services.

Economics Barrier 4 — Idaho Has No Renewable Portfolio Standard

A renewable portfolio standard ("RPS") requires utilities to serve their consumer requirements using renewable energy resources. An RPS generally requires that a percentage of retail electricity sales or generating capacity be served by renewable resources within a specified timeframe. Some RPS provisions require a "set-aside" or "carve-out" for certain resource types the legislating agency prefers, such as solar energy or in-state generation. More than half of U.S. states have adopted some form of RPS, including all states in the West save Idaho and Wyoming.[13] Wind development tends to occur in states with RPS requirements as opposed to states without them.

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[12] Examples of the additional benefits of wind include increased tax and job bases in the state, carbon mitigation, and the benefit of not relying on a costly fuel source such as natural gas.

[13] Database of State Incentives for Renewables & Efficiency, http://www.dsireusa.org

Economics Barrier 5 — Idaho Wind Resource Is Finite

Most life-cycle wind project costs are incurred upfront because the resource uses no external fuel source. As with any capital-intensive resource, expected generation levels affect greatly the economic viability of wind. Excellent wind sites have capacity factors in the low- to mid-40 percent range.[14] Idaho apparently has a small and finite number of wind sites with capacity factors exceeding 35%; many struggle to approach 30%. A 45% capacity factor project has fully 50% more energy to spread its upfront capital costs across when compared to another project generating at a 30% capacity factor. This has implications related to the optimal location of potential wind energy facilities. For example, an in-state site with a 30% capacity factor might be able to generate electricity at around 12 cents per kWh. An out-of-state facility with a 45% capacity factor site might be able to generate the same energy for around 8 cents. However, the higher capacity factor wind project would not be located near Idaho loads. Thus, the cost of transporting out-of-state wind power to Idaho over transmission facilities that have yet to be constructed must be added to the overall calculus of the comparison. For this, among other reasons, the Idaho Legislature has expressed a preference for development of in-state renewables thereby reducing the state's dependence on out-of state generation and recognizing the superior environmental and economic attributes of wind and other renewables[15].

List of Proposed Solutions

The Wind Task Force discussed various solutions to address economic barriers identified in this report.

Proposal Area 1 — Enhance Current Utility Green Power Offerings

Most customers in Idaho can offset the emissions created by their energy use through a green power option. Customers choosing to participate pay an additional sum to their utility; the collected funds go toward the purchase of Renewable Energy Credits ("RECs"), often called green tags, from wind and other qualifying renewable power projects. To date a very small portion of retail loads are met with green power. Were more customers to participate, more money would be available to support renewable generation resources, including wind, thus creating a key market for wind power in Idaho. Two areas hold promise:

First, a green power option could be made available to all Idaho electricity users, with proceeds used to purchase RECs only from renewable generation facilities located in the state of Idaho. A specific agent could purchase and bank RECs from Idaho facilities at market value. Electricity users anywhere in Idaho could purchase blocks of green power from their utility or directly

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[14] Capacity factor describes the ratio of total energy generated to the amount of energy that could be generated if the facility was generating at full capacity for an entire year.

[15] 2007 Idaho Energy Plan, pg. 44.

through the agent. Besides covering the cost of RECs and administrative overhead, a portion of the generated revenues might be used to fund renewable energy projects at Idaho primary and secondary schools. Examples of existing similar programs are "Solar 4R Schools" and the U.S. Department of Energy's "Wind for Schools" programs.

Members of the Wind Task Force noted in their discussions that green power programs in some form have been available to Idaho customers for a number of years with limited participation. A second means to entice more participation could be having the IPUC work with its regulated utilities to develop a new green power rate schedule. In exchange for accepting a rate that likely would be higher upfront, and for committing to purchase green power over a period of years, a customer would not be exposed to volatility associated with changing fuel costs in the remainder of the utility portfolio. Green power customers instead would see their future rate adjustments tied to variability in the cost of acquiring new renewable resources.

Proposal Area 2 — Increase Caps for Net Metering Customers

Relative to neighboring states, Idaho's three investor-owned utilities are generous in their treatment of excess generation for residential net metering customers. Net metering customers are compensated for power they generate that is surplus to their needs. However the amount of generation qualifying for net metering is much smaller than in surrounding states, potentially limiting the contribution this resource could make to Idaho. Limits on net metering generation capacity could be eased, perhaps leading to more agriculture and industrial customers opting to net meter.

Net metering can have fewer impacts on the transmission system when compared to large central-station wind generation because it is dispersed across the entire system, creating a smaller burden on transmission and distribution infrastructure. The limiting factor for net metering generally is the capacity of the service (distribution line and transformer) to the customer's meter. In some cases the costs of service improvements could outweigh the benefits of net metering; however, this result is expected to occur only where net metering systems are installed that greatly exceed the size of a customer's peak energy consumption.[16]

The IPUC is responsible for setting parameters for net metering for the utilities it regulates, and who happen to serve approximately 85% of Idaho retail load. Idaho residential and small commercial customers presently are limited to a 25 kW limit, a level comparable to other states. Large commercial and agriculture customers are limited to 100 kW, significantly below neighboring state limits. Oregon and Utah limit their large commercial and agricultural customers to 2 MW; Nevada's limit is 1 MW. Further, Idaho limits service territory aggregate

[16] Wind generation has the potential to run into barriers with net metering due to its low capacity factor. For example, a 1 MW average load would need to install 3 MW of wind generation assuming a 33% average capacity factor, meaning the service might need to be resized to accommodate the increased capacity. As such, net metering requirements might need to account for this possibility.

net metering to 0.1% of calendar year 2000 peak demand (about 3 MW).[17] Five of our six neighboring states have higher aggregate limits; three have no limit.

Net metering today is not a popular option in Idaho, where 111 customers generate a mere 0.6 MW of capacity. This is likely because of Idaho's low retail cost of electricity and the high cost of generating equipment. It also could be due to the inability of customers to obtain economies of scale by installing larger equipment. However, if energy prices rise as predicted, an investment in net metering equipment could be an attractive option for larger commercial and agriculture customers seeking to reduce or eliminate their power bills. Net metering also appeals to environmentally conscious consumers seeking to meet their energy needs with clean energy. Relaxing capacity limits would afford consumers a better opportunity to invest in renewable net metering equipment.

To this end, the IPUC could raise the commercial and agriculture net metering limit from 100 kW to 2 MW. Likewise, the aggregate limit on net metering could be raised significantly or eliminated.

Proposal Area 3 — Revisit Valuation of Externalities in Utility IRP Processes

The IPUC requires its regulated utilities to file integrated resource plans ("IRPs") every two years to indicate how they plan to serve their customers' needs over the next ten to twenty years. To select a viable and cost-effective plan, the utilities model and perform numerous scenario and risk analyses that include ownership or purchase of supply-side resources, and development of customer measures, including conservation, energy efficiency, and demand-side management. The IPUC accepts and acknowledges the IRP filings as utility planning documents, but does not approve the plans themselves.

The long lead times for development of nuclear generation and coal, and the continuing uncertainty around future carbon emission limitations, have pushed the electricity industry toward combined-cycle gas-fired generators as the primary base load resource included in utility IRPs. The IPUC has expressed concerns with risks, both financial and supply availability, posed by relying substantially on natural gas to produce electricity for sale to retail customers.

The federal government is also signaling its desire to move the country away from carbon-emitting resources. The Congress has initiated, but not passed, several bills in the past few sessions that address climate change, whether through taxation of carbon output or a cap-and-trade system. Any federal climate change law will impact Idaho electricity utilities owning coal and gas-fired generation. Although the mechanism for addressing carbon output is not known at this time, IRPs should consider it as a hedge against future carbon legislation.

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[17] In discussions with its staff, the IPUC indicated that it did not intend to cap net metering when the 0.1% limit was instated; instead it chose to set a limit with the intent to revisit the cap once it is achieved.

Partially in response to these pressures, utilities serving loads in Idaho have begun to consider natural gas reliance risks in their IRPs, and include more renewable resources, including wind.[18]

The Wind Task Force identified three ways to enhance utility evaluations of the benefits of renewable resources, including wind generation. First, the IPUC could formalize existing analytical methods in IRPs by requiring the inclusion of emissions levels and fuel risks for each scenario included in an IRP. The IPUC could communicate this informally or formally through an order to electricity utilities. The inclusion of emission and risk analyses will allow the IPUC and the public to better understand the cost, value, and risks of the various electricity utility resource options.

Second, the IPUC could direct its regulated utilities to assign a higher value overall to renewable resources as a way of recognizing the risk of generating with carbon-based resources. Third, the IPUC could direct its regulated utilities to expand the IRP advisory councils to include more participation by renewable energy and energy efficiency and conservation interests and the IOER.

Proposal Area 4 — Implement a Voluntary Renewable Portfolio Standard

Wind is often considered to be more expensive than fossil fuel alternatives due to its higher upfront capital costs and a failure to consider fossil fuel-fired resource environmental impacts in the economic analysis. In Idaho, as with most U.S. states, utilities are charged with the responsibility of keeping power rates low. In recent years consideration of certain non-price components (e.g., risk, economic development, greenhouse gases) has become more prevalent in utility resource evaluations.

Idaho has historically maintained low power rates and there is a reluctance to mandate a Renewable Portfolio Standard ("RPS"). And even were it to implement a traditional RPS, Border States with better wind regimes, better financial incentives, and resultant lower costs, might end up serving the majority of the RPS need, preventing Idaho from realizing the economic benefits gained by wind power development.

Idaho wind might not in all cases be financially competitive with neighboring states' resources using traditional evaluation techniques. Evaluating solely on the basis of power cost can find the most economical sources are in neighboring states.[19] Wind generated in Idaho has the potential to be competitive with other states when full consideration is given to all of the economic benefits of wind, including: tax payments, job creation, landowner royalty payments, and related purchases in local communities in surrounding areas.

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[18] Utilities have also moved in this direction because of renewable portfolio requirements in other states they serve, and due to the apparent risk in relying solely on a single carbon-based fuel source.

[19] Recent evidence of this result was the 2007 competitive acquisition of Horizon Energy's Elkhorn Valley Wind Project in northeastern Oregon.

Consideration should be given to these related benefits when evaluating projects that provide power within Idaho. Utilities need specific direction from the state that Idaho prefers in-state wind development, and that the societal benefits should be reflected in IRP planning. This recognition is not unprecedented. Colorado became the first state to create an RPS by ballot initiative in 2004. Recognizing the benefits of in-state renewable generation development, each kilowatt-hour of in-state generation receives a 125% credit for RPS compliance purposes.[20]

An approach that provides extra consideration for in-state resources but does not preclude the use of out-of-state resources demonstrates in an easily quantifiable way how much preference should be given to local projects. This approach also prevents truly uneconomic in-state wind projects from being developed, in that a cap on the additional value is set. Where an out-of-state project overcomes the 125% compliance benefit afforded in-state generation in Colorado, its ratepayers benefit from importing the cheaper power.

Most renewable energy developers would prefer an RPS mandate for Idaho, while utilities have historically been opposed to a mandate. A reasonable balance could be to have a voluntary Renewable Portfolio Standard ("vRPS"). A vRPS could send a signal to utilities that renewable energy is important to Idaho, and that generated-in-Idaho sources are even more important. The vRPS sets targets for the utilities to achieve and provides assurance that projects will be positively received by the IPUC.

Idaho could implement a vRPS for wind and other renewable sources. The target levels could be supportive of the Idaho Strategic Energy Alliance by setting a 25% new renewables by 2025 goal; high enough to create a need for additional project development. The vRPS could also provide credit for in-state sources equal to 150% per kWh generated for compliance purposes. Any acquisitions made voluntarily would qualify toward any future state-mandated RPS program, including the 150% provision.

A good faith effort by utilities to comply with a vRPS would reflect positively on them. It would avoid the need to develop a mandatory RPS with penalties that might become expensive, potentially creating an undue burden for utilities and their customers.

Proposal Area 5 — Provide State Tax Incentives

The importance of tax or other financial incentives is illustrated by comparing Idaho to Oregon and Washington. Whereas Idaho ranks 13th in the nation for wind resource, it had 75 MW of wind power installed through 2007, ranking 18th in the nation for wind development. Oregon is ranked 23rd in wind resource, but had over 900 MW of wind power installed by 2007, ranking it 7th in development. Washington, ranked 24th in resource, had over 1,200 MW of wind power

[20] DSIRE: 5/29/2008 Colorado Incentives for Renewable Energy.

and ranks 5th in development. Part of the reason for development success in both of these neighboring states is their proximity to transmission ties linking the wind resources to markets as far south as California. However, both states, and especially Oregon, offer more incentives for development than Idaho.

Idaho transmission system-tied wind developments do qualify for limited tax incentives:

1. Sales Tax Refund–renewable energy power generation equipment (>25kW) is eligible for a 100% rebate of sales tax upon certification of generating performance.

2. Property Tax Exemption–wind projects not regulated by the IPUC are exempt from property taxes on all generation improvements in exchange for a 3% tax on gross power sales.

3. Business Investment Tax Credit–new investments in the state are eligible for a 3% credit against state income taxes. The credit cannot exceed 50% of a business's tax liability. The credit may be carried forward up to 14 years. The tax credit is not transferable, thereby limiting its value given the modest income tax liability associated with most wind projects in their early years of operation.

It is difficult to compare financial incentives between states because they come in different forms. Some offer tax deductions; others offer tax credits; some offer exemptions, while others offer reduced tax rates. Some provide grants, others rebates, some low interest loans, etc. It would require extensive economic analysis to value and rank incentives between states. Nevertheless, there is consensus in the renewable energy sector that Idaho does not score high in financial incentives.

Oregon offers a Business Energy Tax Credit equal to 50% of a renewable energy project's cost. The credit is taken over five years, to a maximum of $10 million for wind energy projects and $20 million for a renewable energy manufacturing business. The greatest value of these tax credits is their transferability. In the likely event the developer does not have enough tax liability to absorb a credit, it may be sold to other individuals and businesses with greater tax liabilities. The income from tax credits is essential in making many Oregon wind projects profitable.

Idaho could enact one or more of the following means to encourage more wind through better financial proformas:

1. Provide a transferable state income tax credit for renewable energy investment greater than the existing 3% business investment tax credit. The transferable investment tax credit percentage could be determined after a comprehensive economic analysis to determine the tax credit necessary to provide a fair return on investment for Idaho wind projects.

2. Eliminate Idaho's 3% gross revenues tax on renewable energy sales while retaining the current property tax exemption for renewable investments.

3. Enact a production tax credit similar to the federal tax program. To minimize the impact to state tax coffers, albeit at the expense of greater development potential, the credit could be non-transferable. Having the tax credit non-transferrable would avoid lowering taxes paid by existing companies in Idaho.

Financial incentives sizeable enough to significantly impact wind development in Idaho may at first appear to have a detrimental effect on the state budget in the short term. However, tax credits generated by development of a renewable energy project are awarded only after the project is completed, usually two to three years after project inception. Thus, the state would be rewarding only economic development that creates jobs and generates tax revenue that would not have otherwise occurred.

Proposal Area 6 — Create an Idaho Energy Trust

The state of Idaho has invested no funds in the development, promotion or facilitation of wind energy. However, the 2007 Idaho Energy Plan and the creation of the Idaho Strategic Energy Alliance, implies that Idaho's leaders want to increase wind and other renewable energy resource development. The question is whether Idaho is willing to raise and spend the funds necessary to realize this goal, especially in today's economic climate.

One potential solution is the establishment of an Idaho Energy Trust. This is not a revolutionary idea, as eighteen states and the District of Columbia levy surcharges on energy sales to fund activities in furtherance of beneficial energy policies.

An Idaho Energy Trust could raise a modest sum for state government promotion and facilitation of renewable energy initiatives. This proposal would raise money by placing a "public purpose surcharge" on Idaho electricity rates. For perspective, a fee of 0.05 cents per kWh would add 55 cents to the average Idaho household's monthly electricity bill and raise as much as $11 million annually if applied across the board to all rate classes and electricity utility customers. A 0.05 cent-per-kWh surcharge would not change Idaho's ranking as a state with low-cost electricity. However, the size of the public purpose surcharge is only an example. An economic analysis is needed to establish acceptable surcharge value recommendations for each rate class. The surcharge could be biased toward the residential rate class, with the aim of having all Idahoans share in the small burden proportionally while avoiding an adverse impact on the competitiveness of Idaho's industrial and agricultural enterprises that compete nationally and internationally for business. To ensure that utility rates are competitive across the state, the charges should apply equally to all utilities in the state.

Drawing on the Idaho Energy Trust, an annual amount of $0.5 million could be allotted to the Idaho Energy Resources Authority ("IERA") as operating funds to promote state infrastructure

for renewable resource development (see next proposal area). A further $0.5 million could be allotted to the Department of Commerce for a renewable energy marketing campaign aimed at attracting renewable energy manufacturing businesses to locate in Idaho. These ideas are discussed below. Idaho Energy Trust funds could also be allocated for research into renewable energy storage systems that mitigate wind's inherent variability, and enhance its integration into the transmission system.

Proposal Area 7 — Fund Idaho Energy Resources Authority to Support Renewables

As explained in the transmission section of this report, upgrades to the transmission system are a large barrier to Idaho renewable resource development. Wind projects and their related transmission upgrades are hindered by a lack of attractive financing options, particularly in the case of smaller developers that do not have large balance sheets from which to finance their projects. The IERA could provide funding for these projects, but it cannot presently finance renewable energy and associated transmission projects except in the case of firms with very strong credit ratings; firms that likely don't need the IERA to obtain financing in the first place.

Created by the legislature in 2005, the IERA is a state chartered energy infrastructure financing authority with a mandate to participate in planning, financing, constructing, operating, developing and acquiring electricity generation, transmission and distribution facilities and their supporting infrastructure. IERA is authorized to issue revenue bonds to finance projects, but must have a credit-worthy project partner. Greatly due to this limitation, IERA to this date has not funded any Idaho projects.

The Idaho State Legislature recognized IERA's limitations when they adopted the 2007 Idaho Energy Plan, and made recommendations to address them. Recommendation E-13 stated that Idaho should provide a credit backstop to enable the Idaho Energy Resources Authority to provide low-cost financing for customer-owned renewable generation and combined heat and power facilities.

The Wind Task Force recognizes the fiscal picture has changed significantly since the 2007 Idaho Energy Plan was adopted by the legislature. Due to a declining economy, Idaho state funds likely will not available to backstop energy projects for the foreseeable future. Accordingly, the Wind Task Force considered other recommendations to enhance IERA's ability to participate in and support renewable energy in the state.

For example, it has been reported that federal economic stimulus funding will soon be available for state infrastructure improvements, including renewable energy. Federal funds could be placed on deposit with the state treasurer and leveraged to support IERA bonds issued to finance renewable energy and infrastructure projects. The funds could serve as bond collateral, allowing the state treasurer to safely purchase them.

Accordingly, IERA could partner with the state treasurer and IOER to apply for as much as $100 million in federal funding as seed money to backstop IERA bonds to finance renewable energy projects and needed transmission upgrades.

To enable IERA to better fulfill its mission, especially in light of the increased activities identified in this report, the state legislature could provide charter funding for the IERA in a manner similar to infrastructure authorities in other states until IERA's investment returns are sufficient to make it self-sustaining. Annual operations funding is estimated to be $0.5 million per year. Alternatively (preferably), IERA operations could be funded by the Idaho Energy Trust discussed earlier in this section, or from the federal funds mentioned above.

Proposal Area 8 — Create a Commerce Initiative to Bring Wind Manufacturing to Idaho

There is no coordinated state initiative to bring wind industry manufacturers to Idaho. A desire exists, but there are few competitive incentives to base a recruiting campaign on. No funding mechanism exists for conducting a meaningful campaign. Consequently, Idaho's potential in the wind manufacturing business is limited; and such limitation likely reduces wind development in the state.

Anecdotal evidence exists that manufacturers of wind energy equipment locate in areas near where wind project development is occurring, and where other positive factors (e.g., workforce quality, transportation corridors, land and facility costs, and financial incentives) prevail. Idaho's workforce is excellent. Wages are competitive and stable. Idaho has good interstate highway services. Rail service throughout Idaho is available and operating. River barge access to the Columbia River and Pacific Ocean is available at the deep water port of Lewiston in central Idaho. Land and facility costs are low in Idaho compared with more metropolitan and industrial states. And, although Idaho itself trails its neighbors in wind project development, it sits in the center of states that have or will have tremendous growth in wind power: Montana, Wyoming, Oregon, and Washington.

In view of Idaho's good wind resource, a competitive policy toward renewables and renewables manufacturing has the potential to greatly accelerate wind energy development and attract wind component manufacturing to Idaho. Assuming state leaders adopt favorable policies, a campaign to bring that information to the attention of wind developers and manufacturers could be very successful.

The Idaho Department of Commerce ("IDOC"), with the assistance of IOER could lead a recruiting campaign consisting of print advertising, website development, and trade show attendance participation. Additionally, top-to-top recruiting visits could be arranged to directly engage candidate companies and promote Idaho's business climate. This campaign likely would cost approximately $0.5 million per year.

The Wind Task Force considered two funding sources for wind manufacturing promotion in the state: (1) the state legislature could provide $0.5 million in increased funding for the IDOC to assist it in promoting renewables manufacturing facilities; and (2) an Idaho Energy Trust could provide this funding, as discussed earlier in this section.

Proposal Area 9 — Pre-Approve Wind Resource Acquisition at Time of IRP Acceptance

The state could recommend that the IPUC pre-approve wind resources in IRPs, thus allowing utilities to aggressively acquire wind projects identified in their plans. The assurance of cost recovery for wind will remove much of the uncertainty surrounding its acquisition.

Task Force Recommendations

After considering its List of Proposed Solutions for project economics, the Wind Task Force submits the following list of recommendations to the Idaho Strategic Energy Alliance Board of Directors for their consideration. The Wind Task Force believes that of its various recommendations in this report, eleven have the best potential to affect future wind development. Three of these fall into the project economics category and are identified with an asterisk.

* *Recommendation 1 – Provide a Transferrable State Tax Credit for Wind*

Idaho could institute a transferable investment tax credit for renewable energy business at a level greater than the existing 3% business investment tax credit. To determine the parameters of the credit, Idaho could initiate an economic analysis, possibly performed by the Idaho Center for Advanced Energy Studies, to ensure the tax credit suits the state's growth goals.

* *Recommendation 2 – Create an Idaho Energy Trust*

Idaho could create a modest energy trust fund by applying a small surcharge on consumer energy rates in the range of 0.05 cents per KWh. The trust could then fund efforts in support of renewable energy development such as infrastructure and renewable energy-based economic development. The trust could be administered within existing state agencies to avoid the creation of an additional bureaucracy.

An economic analysis could be initiated to establish acceptable surcharge rate recommendations for each rate class. The surcharge could be biased toward the residential rate class. The aim would be for all Idahoans to share the small burden proportionally, but avoid impacting the competitiveness of Idaho's industrial and agricultural businesses.

* *Recommendation 3 – Provide a Credit Backstop to Facilitate IERA Project Financing*

Idaho could direct the Idaho Energy Resources Authority to partner with the Idaho State Treasurer and Idaho Office of Energy Resources and apply for $100 million of federal funding for renewable energy and its supporting infrastructure development. The funds, if granted, could be deposited by the state treasurer in an account used to collateralize (backstop) bonds

sold to finance developers with modest balance sheets who otherwise might struggle to obtain low-cost funding. The state treasurer could then become the purchaser of the bonds. As the bonds are retired, the funds could be re-invested in other renewable energy projects.

Recommendation 4 – Enhance Current Utility Green Power Offerings

Idaho could provide a green power option to all Idaho electricity users, with proceeds used to purchase RECs only from wind and other renewable generation facilities located in the state of Idaho. Besides covering the cost of RECs and administrative overhead, a portion of the generated revenues might be used to fund renewable energy projects at Idaho primary and secondary schools.

Recommendation 5 – Increase Caps for Net Metering Customers

Idaho, through the IPUC, could raise the commercial and agriculture net metering limit from 100 kW to 2 MW. Likewise, the aggregate limit on net metering could be raised significantly or eliminated.

Recommendation 6 – Revisit the Valuation of Externalities in Utility IRP Processes

Idaho, through the IPUC, could formalize existing analytical methods by requiring the inclusion of emissions levels and fuel price risks for each scenario included in an IRP. The IPUC could communicate this informally or formally through an order to electricity utilities. The IPUC could also direct its regulated utilities to expand the IRP advisory councils to include more participation by wind interests and the IOER.

Recommendation 7 – Provide an Operating Fund for Idaho Energy Resources Authority

To enable IERA to better fulfill its mission, especially in light of the suggested revitalization of IERA's role in renewable energy identified in this report, Idaho could provide charter funding similar to that provided by other Western states which operate energy infrastructure authorities. The state could create a target date by which IERA becomes self sufficient with earnings on its investments and partnerships. Funding prior to self-sufficiency is estimated to be $0.5 million per year. Recognizing the present shortage of state funds, it may be preferable for IERA funding to come from the Idaho Energy Trust proposed above, or from other federal grants specifically for use in renewable energy development.

Recommendation 8 – Create and Fund a Commerce Department Initiative to Bring Wind Manufacturing Industries to Idaho

Idaho, through the Idaho Department of Commerce, could design a marketing campaign to attract wind energy manufacturing industries to Idaho. To this end, the state legislature could fund IDOC's marketing campaign, or alternatively (preferably) funding could be provided by the Idaho Energy Trust proposed above.

Recommendation 9 – Pre-Approve Wind Resource Acquisition at Time of IRP Acceptance

Idaho could direct the IPUC to pre-approve wind resources in IRPs if they prove to be cost effective, thus allowing the utility to aggressively acquire wind projects identified in their plans. The assurance of cost recovery for wind will remove much of the uncertainty presently surrounding wind acquisition. The passage in 2009 of Senate Bill 1123 appears to have addressed this recommendation.

Siting and Permitting

Much wind project permitting in Idaho takes place at the county level. Accordingly, 44 different county planning boards and commissioners create, implement, and interpret rules that guide permitting decisions. Wind development is also subject to various state agency reviews and legal interpretation. Streamlining the various permitting processes across Idaho would enable more wind generation projects in the state; much can be done to influence these processes.

Barriers to Siting and Permitting

The Wind Task Force identified five siting and permitting barriers. The first is the simple definition of what wind is and is not. The second is the present challenge of transporting wind project components across state roads. Difficulties in the simple erection of meteorological towers makes difficult one of the most basic beginnings of a wind development. The fourth barrier is onerous hazmat requirements. Finally, absent clear state guidance on plant and wildlife protection, the federal government via the United States Fish and Wildlife Service ("USFWS") dictates how Idaho wind projects protect these public assets.

Siting and Permitting Barrier 1 — General Policy Definitions

Anti-wind constituencies are slowing wind project development in Idaho by filing lengthy and costly legal proceedings. One of the most successful arguments used by the litigants to delay or stop wind projects is to claim that wind is not a natural resource; and, therefore wind energy facilities should be regulated in a manner similar to other non-renewable resources in the state.

Siting and Permitting Barrier 2 — Transportation Limitations on Wind Farm Component Deliveries

Some wind project components require trucks capable of hauling loads exceeding 150 feet in length, and 60 tons in weight. Transporting large wind project components is a logistical challenge in the best of conditions. Unfortunately, Idaho does not present the best of conditions. The state does not have a robust database of weight and height tolerances across major thoroughfares and bridges. Absent this information wind project development is hampered and public safety is potentially compromised.

Siting and Permitting Barrier 3 — Meteorological Tower Permitting Requirements are Onerous

The erection of a meteorological tower is one of the most important components of bringing a wind project to fruition. It is also a process that should be simple and efficient. Meteorological towers are very simple in design and nearly uniform in erection. They pose a minimal impact on the environment, and very little risk to human safety. Unfortunately permitting in the 44 counties of Idaho is not consistent and oftentimes becomes a victim to then-current political opinions about wind power.

Siting and Permitting Barrier 4 — Hazardous Materials Requirements for Wind are Onerous

As with any industrial process, wind projects require the management of a fairly uniform number of hazardous materials (e.g., lubricants). The Idaho Department of Environmental Quality ("DEQ") regulates hazardous materials in the state, including those for wind project developments; but no standard list of generally-required wind project hazardous materials exists, requiring complicated and lengthy permitting processes for each individual wind project.

Siting and Permitting Barrier 5 —The USFWS is in Charge of Idaho Environmental Policy for Wind

Due to a lack of uniform state regulations, wind projects in Idaho presently are granted their environmental permits for plants and wildlife by the USFWS. The policies dictated by USFWS limit wind development because of costly and lengthy processes that remain in a state of flux. Wind project developers simply cannot be certain what the expectations placed on their development will be.

List of Proposed Solutions

The Wind Task Force discussed various solutions to address siting and permitting barriers.

Proposal Area 1 — Better Policy Definitions will Advance Wind Generation

Wind power development has been hindered at the county level by arguments stating that wind is not specifically identified as a natural resource. Legislative and/or executive action would be helpful to encourage wind generation through a resolution in its support. To further wind development in Idaho, the state legislature could:

1. Define wind blowing across the state as a natural resource in the same manner as sunlight and water.

2. Pass a resolution stating that wind generation is a priority of Idaho in order to a) create energy independence, b) distribute and diversify generation supplies, c) assist rural community economic development, d) provide employment opportunities for its citizens, and e) to provide educational opportunities for its citizens.

Proposal Area 2 — Develop a Transportation Guidebook for Oversized Loads

The state of Idaho and its citizens and businesses would benefit from uniform regulations and standards/information for oversize load travel on state transportation routes. The state transportation department could develop a guide and process, with the transportation of wind project components in mind, and ensure it contains set routes based on height and weight tolerances for major thoroughfares to take the guessing out of transportation planning. The guide could highlight height constraints due to insufficient overpass clearances and propose alternative routes. It could also provide similar information for bridges in the state with insufficient load bearing capability.

Proposal Area 3 — Develop a State Meteorological Tower Permit for Wind

The state could direct the Aeronautics Division of its transportation department to create a simplified, uniform, and expedited (i.e., approval within 2 weeks) permit for all towers under 200 feet in height. The 2-year renewable permit could be similar in fashion to the general construction permit notice of intent so long as the installation had the following basic attributes:

1. No permanent foundation.
2. The top 30 feet painted in 6-foot alternating red and white bands where height exceeds 100 feet.
3. An approved FAA Form 7460-I.
4. A position at least one fall height distance from any property boundary, road, residential structure, etc.
5. Marked guy wires and guy wire clusters.
6. A notice to the county assessor in place for tax purposes.

Further, the state could direct the department to make the application available online and track all permits through an online and publicly-accessible database.

Proposal Area 4 — Develop Standardized DEQ Hazmat Regulations for Wind

Wind project permitting is complicated by hazardous materials management issues. A standardized DEQ checklist would help greatly. Similar to agriculture sheds, the state could positively impact wind development by the creation of a standardized list of industry-used solvents, lubricants and other materials, and their volumes, generally used in wind project maintenance, setting upper limits for items of concern.

Proposal Area 5 — Put State in Charge of Environmental Permitting for Wind

To ensure protection for sensitive animal, plant and habitat while also meeting the state's desire to promote wind development, Idaho needs to take the lead. The federal government is filling the present void at the expense of state environmental priorities and wind development by creating lengthy and costly environmental processes.

The state could create a task force comprised of various state agencies (e.g., Fish and Game, Lands, Energy Resources) and industry experts to develop priorities backed by sound science that guides the development of wind and other renewable resources in a manner consistent with environmental priorities. The process would allow the state to dictate policy even on federal lands. By developing an environment of cooperation, both between state agencies, as

well as between the state and the federal government, state wind development would proceed more efficiently.

Task Force Recommendations

After considering its List of Proposed Solutions for siting and permitting, the Wind Task Force submits the following list of recommendations to the Idaho Strategic Energy Alliance Board of Directors for their consideration.

Recommendation 1 – Develop Better Policy Definitions to Advance Wind Generation

Idaho could define wind as a natural resource equal and comparable to water and sunlight.

Recommendation 2 – Develop a Transportation Guidebook for Oversized Loads

Idaho, through its transportation department, could develop a guidebook and process, with the transportation of wind project components in mind, and ensure it contains set routes based on height and weight tolerances for major thoroughfares to improve wind transportation planning.

Recommendation 3 – Develop a Standardized Meteorological Tower Permit

Idaho could direct the Aeronautics Division of its transportation department to create a simplified, uniform and expedited permit for all towers less than 200 feet in height. Further the state could consider directing the department to make such applications available online and track all permits through an online, publicly accessible database.

Recommendation 4 – Develop Standardized DEQ Hazmat Regulations for Wind

Idaho could positively impact wind project permitting by creating a standardized list of industry-used solvents, lubricants and other materials, and their volumes, generally used in wind project maintenance, setting upper limits for items of concern.

Recommendation 5 – Put the State in Charge of Environmental Permitting for Wind

Idaho could create a task force comprised of various state agencies (e.g., Fish and Game, Lands, Energy Resources) and industry experts to develop priorities backed by sound science to guide wind power in a manner consistent with environmental priorities. The process could allow the state to dictate policy, even on federal lands, allowing permitting to proceed more efficiently in a spirit of cooperation among state and federal agencies.

Stakeholder Outreach and Public Awareness

Negative stories from some of the earliest wind projects perpetuate in the public mind: noise, bird and bat kills, unreliable generation, costly and heavily subsidized generation, and reduced property values. Objections typically arise in county planning and zoning hearings and are heavily reported in the news media. Although a wind project can overcome this misinformation, valuable resources are expended, sometimes to an extent that prevents a wind project from entering commercial service.

Barriers to Best Information

A discussion of each barrier is detailed below. Many of the barriers are directly related to the common public attitude popularly known as NIMBY (Not In My Back Yard), which create significant obstacles that can delay or prohibit development.

Best Information Barrier 1 — Belief that Wind Farms are Noisy

Early wind turbine technologies were substantially noisier than turbines built today. Noise is the result of inefficient wind capture. Engineers have worked successfully since the 1980s to make wind turbine designs more efficient and therefore less noisy. Variable pitch blade technology alone greatly reduces turbine noise. Instead of pushing against the wind or fighting the wind because of incorrect attack angles, individual blades "fly" the wind like an aircraft wing. An operating wind project using current wind technology at a distance of 750 to 1,000 feet is no noisier than a kitchen refrigerator or a library reading room (44 decibels).

Best Information Barrier 2 — Belief that Wind Farms Kill Birds and Bats

Wind projects do kill birds; however, current siting requirements ensure that such impacts are modest or even trivial. Much of the concern over bird kills stems from Altamont Pass in California, one of the first wind projects installed in the United States and the only wind development area that experiences significant bird deaths, specifically to raptors. Media coverage about Altamont often leaves the impression that all wind power projects have a significant effect on birds, despite overwhelming evidence to the contrary. Wind energy accounts for fewer than 3 in 100,000 bird deaths occurring in the United States, a tiny fraction relative to domesticated cats and windows.

Many national ornithology organizations, including the National Audubon Society and environmental groups like The Nature Conservancy and The Sierra Club support wind development on a scale 20 times that of present levels and work with wind developers to minimize impacts on avian species.

Bats also collide with wind turbines. Bat fatalities have been documented at higher than expected rates in isolated locations. The Bats and Wind Energy Cooperative ("BWEC"), formed in late 2003, has raised millions of dollars to fund studies designed to reduce bat mortality.

BWEC is focused on finding good site screening tools and testing mitigation measures, including ultrasonic deterrent devices to warn bats away from turbines.

Best Information Barrier 3 — Belief that Wind is an Unreliable Generation Source

Wind is variable, not unreliable (refer to the section on variability in this document for more discussion around wind variability). In fact, wind turbines are as or more reliable than many conventional electricity generators. The challenge lies in predicting the amount of wind energy available to power the turbines. Commercial wind forecast services may be employed to increase accuracy of resource planning.

Best Information Barrier 4 — Belief that Wind Power Is Costly and Heavily Subsidized

Upfront capital costs, as with hydropower generation and other forms of renewable energy, are high for wind generation projects. In exchange for high upfront capital costs, its fuel (i.e., wind) is free. This contrasts with today's most efficient gas-fired turbines, where fuel can reach two-thirds of the total lifecycle cost of the plant. Wind power's lack of fuel cost and carbon risk makes it oftentimes cost competitive with other energy sources. Recent wind project cost increases reflect the overall state of the current economy; all generation resources cost substantially more to construct today than just a few years ago.

Many believe that wind projects benefit from subsidies that exceed those provided to other generation technologies. Energy subsidies broadly fall into two categories: research and development ("R&D"), and financial incentives such as tax incentives, loans, insurance, and other awards. In the five-year period 2002-07, federal R&D funds for electricity generation totaled $11.5 billion. Financial incentives to the electricity generation industry totaled $18.2 billion. During fiscal year 2006, the coal industry alone received more than ten times (more than $6 billion) the tax incentive provided to wind power (just under $600 million). Of the tax incentives wind receives, nearly all of the money is directly connected to electricity generation. Of the tax incentives granted coal, only one third is spent on bringing electricity generation to the transmission system. Across the nuclear industry, not a single tax dollar spent in the past five years has brought a new generation facility to market.

Best Information Barrier 5 — Belief that Wind Power Reduces Property Values

Wind detractors argue that wind projects decrease the value of properties within the wind project view shed. This is simply not true. While no peer-reviewed scientific studies have documented this affect, many studies have shown the opposite: that property values in the wind project view shed not only keep up with regional property values, they sometimes have greater than average value appreciation.[21]

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[21] "*The Effect of Wind Development on Local Property Values,*" Sterzinger, Beck, and Kostiuk, Renewable Energy Policy Project, May 2003.

Best Information Barrier 6 — Belief that Wind Power Places a Burden on Host Counties

Some believe that locating a wind project in a rural county will overwhelm or at least strain public services and infrastructure. The opposite is true. Wind project development and operations bring a huge economic boost to the communities they serve, through new living-wage jobs, lease payments to landowners, and tax payments to local governments. One federal study explains that for every megawatt of installed wind generation capacity in Idaho, approximately $1 million in direct and indirect economic benefits are created over the life of the project.[22] For a 100 MW wind project, that means nearly $5 million per year, with much of it front-loaded in the early years of development and construction.

List of Proposed Solutions

The Wind Task Force discussed various solutions to address the myths, misinformation and public awareness barriers identified in this report.

Proposal Area 1 — Develop a System to Refute the Myths and Misinformation, and Enhance Public Awareness of Wind's Many Benefits

There is solid, documented evidence to refute the myths and misinformation residing in the public domain. Much information and independent reference materials are available on the American Wind Energy Association website (www.awea.org). Wind developers quote these references and file them with county officials as necessary during permit hearings. Wind developers and their attorneys and consultants also write opinion pieces and/or news releases for publication in the newspaper or other outlets to counter negative publicity, but only if provoked by negative publicity.

Private efforts like these by developers are perceived by many as self-serving. A source of documentation sponsored by Idaho could go a long way in limiting the effectiveness of anti-wind advocates using bad science and myths to promote their agendas. As such, the state could commission a task force to develop a resource for all Idaho citizens wanting to know the facts about wind power. The task force could be comprised of individuals, IOER, IDOC, and industry experts, among others. The task force could compile the best information and science and disseminate it through publications and a website with a frequently asked questions ("FAQ") section.

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[22] *"Economic Benefits, Carbon Dioxide (CO_2) Emissions Reductions, and Water Conservation Benefits from 1,000 Megawatts (MW) of New Wind Power In Idaho,"* U.S. Department of Energy, Energy Efficiency and Renewable Energy, 2008, http://www.nrel.gov/docs/fy09osti/44145.pdf

Task Force Recommendations

After considering its List of Proposed Solutions for Stakeholder Outreach, the Wind Task Force submits the following recommendation to the Idaho Strategic Energy Alliance Board of Directors for their consideration.

Recommendation 1 – Develop a System to Refute the Myths and Misinformation, and Enhance Public Awareness of Wind's Many Myths

The state, through the IOER and IDOC, could collaborate and compile the best information and science available to refute misinformation about wind energy. The information could be formatted in a FAQ style as well as links to the best supporting information. The FAQ and links could be posted on appropriate state agency websites and offered to others such as Idaho National Laboratory and individual wind developers for inclusion on their websites.

Transmission

Transmission is what economists might define as a quasi-public good because the benefits created by its development extend beyond its direct participants. Generation project owners clearly benefit to the extent that transmission enables their product to reach a marketplace. Utilities and their consumers benefit from having more options to reliably meet their load obligations at lowest cost. Society benefits from the products and services that a robust transmission system allows through low cost and more plentiful products and services. Defining the unique beneficiaries of a transmission system, and how the costs of such system should be paid for is a difficult challenge. Traditional ways of financing transmission system upgrades in a changing environment where the vertically-integrated electricity utility model is giving way to more competition might not best meet the future needs of Idaho.

The transmission system in Idaho is a clear barrier to wind development, just as it is in many neighboring states. As is typical for wind energy across the United States, the best resource potential generally resides in areas with low population densities and limited transmission infrastructure. Additional transmission infrastructure is necessary to support both intra- and extra-state wind deliveries. Transmission investment is occurring, but at a rate likely to be inadequate to support wind development at a level necessary to support the 25 x '25 goal.

The cost of transmission upgrades varies widely depending on location, terrain, equipment, materials, and labor needed. Transmission line additions arrive in lumpy and not discrete quantities. A specific project for wind integration often requires an upgrade much larger than would otherwise be necessary to transmit its average generation. If a new transmission line is needed to accommodate a wind generator, then right-of-way, land use, and permitting issues can arise and increase costs. Also, experience indicates that landowners, even in remote areas, may object to new transmission lines because of conflicts with existing land uses and view obstructions. New transmission costs currently range from $1 to $2 million per mile. Resulting transmission upgrade costs, or new transmission lines for new wind generators can be a large portion of project costs and, in some cases, can be prohibitive. On the other hand, if the transmission utility paid for transmission upgrades upfront, retail and wholesale ratepayers would have to bear the cost.

Under current FERC large generator interconnection policies, a generation interconnection customer must pay upfront for any transmission network upgrades necessary to allow its interconnection to the transmission system. Once interconnected to the transmission system, an eligible customer under the transmission owner's open access transmission tariff can obtain transmission service on the transmission system to sell power to a party other than the transmission owner. Depending where the transmission service is requested, additional transmission system network upgrades might be required. The transmission customer requesting this service might be required to pay for these upgrades upfront. Over a period of up to twenty years the transmission owner credits back (refunds) these transmission network

upgrade costs to the transmission customer based on transmission usage; the refunded amounts become part of the utility's rate base recovered from all customers. The underlying theory is that the generation interconnection customer is the initial cost causer, but that over time network upgrades benefit all users of the transmission system—retail, wholesale, and generator customers. Where a generation interconnection customer interconnects with the transmission system at a point with sufficient transmission capacity for integration, he incurs only the direct assignment facilities costs to interconnect his project. Where a generation interconnection customer interconnects at a location with constrained transmission capacity, he will pay for all upgrades necessary to integrate his facility. A generation interconnection customer therefore must pay for transmission network upgrades based entirely on how much transmission capacity is available at the point where the generation interconnection customer facilities interconnect with the transmission system.

Barriers to Transmission

The Wind Task Force identified four transmission barriers. The first is that transmission upgrades are very capital intensive; a developer must pay for nearly all transmission lifecycle costs upfront and many simply do not have resources adequate to fund transmission upgrades. Additionally, transmission improvements are lumpy with upgrades generally providing transfer capacities well beyond the needs of the developer. This forces the first developer in an area to finance its competitor's projects.

The second barrier to transmission development is its inherent complexity. Few professionals, even within electricity utility companies, have a good understanding of transmission system operations. Developers therefore are at an information disadvantage when attempting to site a wind generation resource. Obtaining the information necessary to ascertain the impact of potential transmission upgrade costs can be expensive, both in terms of the necessary interconnection and transmission studies that must be purchased from the transmission owner who ultimately will transport the wind project's output, and in terms of the time that will be required to complete the studies themselves.

The third barrier is the time it takes to construct or upgrade transmission facilities. New transmission generally cannot be constructed in fewer than two years. Where transmission corridors are located in sensitive areas, timelines of up to ten years are not uncommon. Developers must anticipate these timelines and build them into their development schedules and hope they do not extinguish the viability of their wind projects.

Lastly, wind development is limited by Idaho's lack of interconnections to existing and planned high-voltage transmission corridors passing through the state. Limited opportunities to export wind likely have compromised wind development in Idaho.

Transmission Barrier 1 — Capital Intensity

A new wind generator must request interconnection to the transmission system, regardless of whether that power is sold to the interconnecting utility or to a third party. The request puts the wind project in the transmission owner's queue with other interconnection requests, triggering a series of studies to determine the feasibility, system impact, and facilities necessary to accomplish the interconnection, and, ultimately, leads to an interconnection agreement between the wind developer and the transmission owner that governs ongoing costs and responsibilities of the two parties. The utility determines and usually constructs all facilities necessary to interconnect the wind generator to the transmission system, and the wind developer bears all costs incurred for the studies and facilities, pursuant to Federal Energy Regulatory Commission and IPUC policies.[23] The cost drivers for interconnection are specific for each wind generator and include distance from the facilities necessary for interconnection, location, terrain, design, labor, equipment, and materials. Thus, interconnection costs are not standardized, vary greatly, and can add substantially to wind project costs.

Building new or upgrading existing transmission facilities can cost $1 million per mile or more, making transmission a very capital intensive endeavor. Many developers simply do not have the resources necessary to fund transmission upgrades, even in cases where the value of their project including transmission improvements is cost-effective.

Besides being capital intensive, transmission improvements are lumpy with upgrades generally providing transfer capacities well beyond the needs of the developer. This can force the first developer in an area essentially to finance its competitor's projects, creating an equity issue. Even developers who are not first in line are at risk. In the case where the first developer does not complete its project, the second-in-line developer becomes responsible for financing the required upgrades.

Transmission Barrier 2 — Lack of Information

Each utility presently develops a resource plan listing the resources they intend to build or acquire, and transmission expansion required to integrate those resources. The IPUC reviews the options and considers expansion requirements and their associated cost recovery. Through an iterative process the utility and the IPUC arrive at the recommended resource acquisitions and required system upgrades associated with integrating those resources.

Utilities look at several options to acquire needed resources and the impact on the transmission system for each. Likely, only the best plans or options, based on expected resource costs for interconnection requests in the queue at the time of the IRP submittal, are put forward for

[23] FERC has jurisdiction over interconnection of all generation projects, except those projects selling their output to the interconnecting utility under the Public Utility Regulatory Policies Act (PURPA), which fall under the jurisdiction of the Idaho PUC.

review by the IPUC and the public. Although long range plans are presented, these too may be based on then-known resource options and might not consider wind generation locations not being proposed at the time. FERC does require that each utility post constrained areas of their systems, but again this information might not address how much it would cost to upgrade the transmission system where restricted. Another area where information may be limited is where there is substantial available capacity, especially where that aligns with wind resource areas with high potential. Wind developers therefore may be left only with the option of requesting interconnection and/or transmission service to determine if their site is viable from a transmission perspective. Obtaining information in this manner is both time consuming and expensive. However, this is the process applicable to all generation development and is not unique to wind.

Transmission Barrier 3 — Timeliness of Transmission System Modifications

Transmission construction can require long lead times, especially where upgrades affect a long line or require the construction of a new line. Among the long-lead-time items are right-of-way, permitting, and certain key components including transformation equipment. A wind project can be completed in less than a year. Interconnection and transmission, on the other hand, is unlikely to take fewer than two years.

Transmission Barrier 4 — Minimal Access to Regional Transmission system

Oftentimes the local utility serving the area where a wind facility is located is not interested in the project, or cannot pay prices high enough to support its development. The only solution for the developer in this circumstance is to export the power to another utility or region. Much wind being developed across the Northwest, but outside of Idaho, is being exported to markets distant from the generating facility. The largest wind facility presently scheduled across the transmission system serving load in Idaho is located in the State of Oregon.

Moving wind energy to other regions necessitates interconnections and additional transfer capabilities above the interconnection capacities that exist today in Idaho. A number of transmission projects are expected to cross the state in the next decade; however, there are no plans to provide access for new wind generation. Wind development in Idaho will be hampered without better access to markets outside of Idaho.

List of Proposed Solutions

The Wind Task Force discussed various solutions to address transmission barriers identified in this report.

Proposal Area 1 — Utilities Study Transmission System Expansion in Integrated Resource Plans

Preplanning expansion of the transmission system could ensure that expansion is directed towards the best regions for wind instead of being reactionary to service requests. Developers

then would be aware of the best development sites based on wind potential and transmission expansion costs. Preplanning would require utilities to consider wind resource development in their utility plans. Today plans focus primarily on the specific needs of serving retail electricity customers, not wholesale customers of the transmission system.

To ensure that preplanning occurs, the IPUC could direct its utilities owning significant transmission assets in the state of Idaho to perform, as part of their biennial integrated resource planning process, analyses of the transmission system at various locations where wind development is expected over the resource planning horizon. The studies could benefit from public input with the results published in the IRP and available to the public at large, including wind developers. For locations where transmission limitations exist, the IRP could provide estimates of the costs associated with upgrading the system. The state through the IPUC could take comment from the public on the submitted IRP and provide guidance on the options that best support renewable goals. This approach would support some of the other proposed solutions in this report, including energy corridors and fronting costs for wind generation interconnection and associated network upgrades.

Proposal Area 2 — Utilities Help Finance Transmission Upgrades

Utilities could take a significant role in financing transmission upgrades to further wind development in Idaho. Allowing upfront costs paid for by developers to be repaid by utilities over a shorter period of time, or by having developers repay utility investments over time instead of upfront would remove a major financial barrier to wind development. The Wind Task Force identified four potential ways that utilities could help support wind development. Because transmission tariffs are the purview of FERC, each of these proposals might require approvals by the Federal Energy Regulatory Commission. And because transmission tariffs generally are spread equally across all transmission facilities that can serve loads under the jurisdiction of other state utility commissions, cost recovery obligations placed upon out-of-state jurisdictions would need to be considered.

Wind developers could pay for all transmission upgrades, but utilities would then refund those costs over five years. The refunds could be returned following the FERC method of transmission credits followed by a lump-sum payment for those costs not returned through the credits, a simpler 60-month flat payment, or some other schedule. The specifics of this proposal could be accomplished through a collaborative effort by utilities, wind developers, other interested stakeholders, and the IPUC.

Three possibilities were discussed by the Wind Task Force:

1. State utilities could pay for all transmission upgrades necessitated by new wind power developments, without limitation, if they are proven to cost-effective and to benefit of the ratepayer. The upgrades would be placed in utility rate base and be passed through to all

customers in the form of higher wholesale transmission rates and rates for retail electricity service.

2. State utilities could pay for all transmission upgrades necessitated by new wind power developments, subject to a cost cap to limit ratepayer impacts. The cap might take many forms, (e.g., per-kW, annual utility total) to recognize that while transmission upgrades generally have benefits to parties besides the wind developer, some projects should not be developed due to their locations in very remote areas, or in areas so electrically constrained as to have very unfavorable societal values. To ensure that the cap is set at a level both fair to wind development efforts and utility ratepayers, the IPUC or another state agency could hold hearings with interested parties to include utilities, wind developers, and other stakeholders.

3. The state could develop a collaborate process, patterned after work by the Western Governors' Association and the states of California and Texas, to identify renewable energy zones and develop transmission infrastructure plans to enable wind development in the state. Identifying wind zones would lead to more consolidated and efficient expansion of the transmission system. For utilities regulated by the IPUC, each utility's IRP process could be used. Non-regulated utilities would be responsible to develop similar processes for their systems. The processes would provide a forum of collaboration for identifying the best wind zones in Idaho, and plans to bring transmission service adequate for development in these areas. This effort would lead to the electricity utilities offering incentives, including paying all or part of transmission upgrade costs, adequate to enable wind development in the renewable energy zones.

Proposal Area 3 — Utilities Finance Interconnection Costs

Wind projects are cost causers and beneficiaries of interconnection. Absent interconnection, wind projects cannot deliver their output to consumers. Under current FERC policies, the transmission utility must address interconnection by studying one wind project at a time, based on the position of the project in the interconnection queue. This process can work well for certain types of projects (e.g., gas-fired generators, where only one project typically is built at one location), but many wind projects can locate in a single area where good wind conditions exist. When this occurs, the transmission utility can study the projects as a cluster, but ultimately each wind project must pay for its individual interconnection costs.

Stakeholders in the California electricity and wind industries recently developed a new approach that holds promise for Idaho. Recognizing the massive generation potential in its Tehachapi Mountains area, and that individual wind developers were not able to fund interconnection facilities necessary to bring this generation to the larger transmission system, the California Independent System Operator, which operates California's transmission system, asked FERC to reverse its interconnection policy by allowing utilities to pay upfront for

interconnection and charge the wind developers for those costs over time. The federal agency approved this approach and allows utilities in California to "right-size" expansion of their transmission system, both to maximize wind development and minimize costs.

Idaho's electricity utilities, wind developers, and other stakeholders therefore could develop a proposal similar to California's where utilities pay for interconnection costs upfront and recover those costs over time from wind developers. Interconnection incentives could be tied to the identification of the best wind zones in Idaho so that expansion of the transmission system can focus on consolidating and delivering wind generation from those areas with the greatest projected wind output.

Proposal Area 4 — An Idaho Transmission Planning Group

As has been illustrated throughout this discussion, a key barrier to developing new wind generation resources in Idaho is adequate electricity transmission capacity. Under the open access policies established by FERC, each transmission owner must expand existing facilities or build new ones to accommodate requests for interconnection and transmission service for new electricity generators. This piecemeal approach guarantees that renewable generators can obtain necessary access to the transmission system, but it is not efficient—both in terms of timeliness and cost—for large-scale deployment of wind generation in the state of Idaho.

In 2007 FERC issued Order 890 requiring transmission planning to be conducted in a public process. Idaho's electricity utilities are currently assembling planning studies at the local, sub-regional, and regional levels for completion in 2009.[24] All Idaho utilities are participating in planning studies being conducted by the Western Electricity Coordinating Council.

Whether upgrading or building new transmission lines, utilities must address several major issues, including land use, site accessibility, permitting, financing, and operations. Idaho, like the other western states, contains large tracts of federal land controlled by agencies with their own land use processes. County planning and zoning processes that affect transmission planning also exist.

The coincidence of transmission planning efforts now underway in Idaho, the Northwest, and the West, and the need to efficiently and cost-effectively provide access to market for new renewable resources developed in Idaho, points toward placing all of these transmission issues in a single location: a Transmission Planning Group.

The state of Idaho could establish a Transmission Planning Group to determine the most efficient and cost-effective ways to address transmission system improvements and additions

[24] Idaho Power and PacifiCorp participate in the Northern Tier Transmission Group; Avista and the Bonneville Power Administration participate in Columbia Grid.

necessary to maximize renewable energy production in Idaho. The Transmission Planning Group would be responsible for:

1. Promoting transmission development in Idaho.
2. Participating in regional transmission efforts with an eye toward maximizing throughput for Idaho wind resources.
3. Exploring means to facilitate right-of-way on state and private lands.
4. Developing incentives for transmission system operators to expand their transmission systems to enable wind generation.
5. Participating in or coordinating efforts to create Idaho renewable energy zones.
6. Identifying and addressing the operational impacts of renewable resources.

Proposal Area 5 — Annual "Open Season" For Interconnection and Transmission Requests

Obtaining interconnection and transmission service requires a new wind project developer to make a formal request to the transmission provider. This request places them in line for utility studies. The transmission provider then studies the proposed wind development assuming all previous project studies come to fruition and that no other projects will be available in the future to offset costs placed on the project then being studied. Making these assumptions simply is not efficient. Rarely do all studied projects ahead of a developer in the line come to fruition. This result has the potential of shifting cost burdens on the developer that were not anticipated and could make his project nonviable.

Parties that would share the same transmission or interconnection facilities, but that enter the study line after the developer has, are not assumed to share any cost burdens, leaving the developer to correctly assume absent any other better information that all upgrade costs will be borne by his project alone. In some cases this assumption will render the wind project unviable. Adding further problems, some utilities have witnessed such a phenomenal list of requests that they have needed to delay their studies for months and years. These delays are very costly to the developer and potentially limit wind development in Idaho.

BPA had all of these challenges prior to its 2008 transmission system "Open Season." This effort cleared more than 50% of its transmission requests from the line, allowing the federal agency to focus on developers serious enough to expend funds to stay in the process, and also to consider the impacts of one project on others using similar facilities.

Regulated utilities in Idaho could offer annual or biennial "open seasons" to pre-approve those projects that will be acquired to meet the generation needs of each utility. Projects that would use similar interconnection and transmission facilities could be clustered so as to inform each

developer of what his prorate share of a larger upgrade project would be. It is likely that the state would need to work with its utilities and FERC to enable the provisions of this recommendation.

Proposal Area 6 — Enable IERA to Assist in Funding Transmission Upgrades

Created by the legislature in 2005, the IERA is a state chartered energy infrastructure financing authority able to participate in planning, financing, constructing, operating, developing and acquiring electricity generation, transmission and distribution facilities and their supporting infrastructure. IERA is authorized to issue revenue bonds to finance projects, but must have a project partner with good credit.

Today IERA operates reactively because it is not funded by the state. Further, because of credit requirements, only projects backed by financially strong entities (e.g., utilities) can be pursued. Entities with strong balance sheets likely have access to more attractive funding sources than the IERA can provide. Smaller developers that might actually benefit from IERA funding because they cannot obtain the attractive financing provisions that IERA can offer find they cannot qualify for IERA assistance for similar reasons (e.g., an immature balance sheet).

The Idaho State Legislature recognized IERA's limitations when they adopted the 2007 Idaho Energy Plan. Recommendation E-23 stated that "Idaho should provide a credit backstop to enhance the Idaho Energy Resource Authority's ability to provide low-cost financing for transmission projects that benefit Idaho citizens." A credit backstop would enable the IERA to use its bonding authority to finance transmission interconnection and upgrade costs for smaller developers with viable projects that cannot otherwise obtain cost-effective credit terms, thereby lowering overall project costs.

The Wind Task Force recognizes that current economic conditions all but foreclose the option for the state to backstop credit for renewable energy developers in the foreseeable future. As discussed in Project Economics, Proposal Area 7, federal stimulus funds earmarked for renewable energy development could be requested by Idaho and if received, the funds could be sequestered by the state treasurer and used to collateralize IERA bonds. Conceptually, the fund would exist permanently and would backstop IERA bond financing far into the future.

To enable the IERA to meet this mandate, the legislature could fund the agency at a level sufficient to cover operations until such time as its investment portfolio makes its operations self-sustaining. An estimated funding level of $0.5 million per year would be consistent with infrastructure authorities operating in other states against which Idaho energy developers compete.

Proposal Area 7 — Streamline Transmission Permitting and Rights-of-Way Acquisition

Idaho can encourage new transmission lines to deliver energy to markets in state and out of state by streamlining the permitting and right-of-ways processes that oftentimes delay projects by years.

Task Force Recommendations

After considering its List of Proposed Solutions for transmission barriers, the Wind Task Force submits the following recommendations to the Idaho Strategic Energy Alliance Board of Directors for their consideration. The Wind Task Force believes that of its various recommendations in this report, eleven have the best potential to affect future wind development. Two of these fall into the transmission category and are identified with an asterisk.

* *Recommendation 1 – Provide 5-Year Paybacks to Wind Developers for Transmission Upgrades*

A collaborative effort by utilities, wind developers, other interested stakeholders, and the IPUC could be convened to identify a means of reimbursing wind developers for transmission infrastructure upgrades over a 5-year period. This shorter refund period would better enable wind developers to finance transmission improvements while enabling transmission owners a means to bring such upgrades into their cost structures over time.

* *Recommendation 2 – Utilities Fund Transmission Upgrades in Renewable Energy Zones*

Idaho could develop a collaborative process, patterned after work by the Western Governors' Association and the states of California and Texas, to identify renewable energy zones and develop transmission infrastructure plans to enable wind development in the state. Electric utilities could offer incentives, including paying all or part of the transmission upgrade costs necessary to enable wind development in the identified renewable energy zones.

Recommendation 3 – Require Transmission System Expansion Studies

Idaho, through its IPUC, could direct its utilities owning significant transmission assets in the state of Idaho to perform, as part of their biennial integrated resource planning process, analyses of the transmission system at various locations where wind development is expected over the resource planning horizon. For locations where transmission limitations exist, the IRP could provide estimates of the costs associated with upgrading the system.

Recommendation 4 – Create an Idaho Transmission Planning Group

Idaho could establish a Transmission Planning Group to determine the most efficient and cost-effective ways to address transmission system improvements and additions necessary to maximize renewable energy production in Idaho. The Transmission Planning Group could be responsible for promoting transmission development in Idaho, participating in regional transmission efforts with an eye toward maximizing throughput for Idaho wind resources,

providing Idaho wind facilities access to larger markets in other states, exploring means to facilitate right-of-way on state and private lands, developing incentives for transmission system operators to expand their transmission systems to enable wind generation, participating in or coordinating efforts to create Idaho renewable energy zones, and identifying and addressing the operational impacts of renewable resources.

Recommendation 5 – Enable IERA to Fund Transmission Projects

Idaho could seek federal stimulus funds as a means of providing a backstop for financing wind generation transmission projects, including those proposed by non-utility developers. To enable the IERA to meet this mandate, the state could fund the agency at a level of $0.5 million per year, consistent with infrastructure authorities operating in other states against which Idaho energy developers compete. IERA could be funded by the Idaho Energy Trust as discussed in another part of this report.

Recommendation 6 – Streamline Permitting and Right-of-Way Acquisition

Idaho could encourage new transmission lines to markets in state and out of state by streamlining permitting and right-of-ways processes.

PURPA (Qualifying Facilities)

Many Idaho wind project developers seek to sell their output through the Public Utility Regulatory Policy Act of 1978 ("PURPA"). Under PURPA utilities are obligated to purchase output from qualifying facilities at their avoided cost. PURPA contracts provide the qualifying facility a known contract price, or PURPA rate, and a guaranteed off taker for their generation. These two benefits aid in project financing and eliminate uncertainty that would occur were the developer to bid his project into a request-for-proposals process, the other common avenue by which projects sell their output.[25] If the PURPA rate is not high enough to make the economics of the wind project work, the project does not get built. Several barriers associated with the current PURPA process exist that, if remedied, would help usher in more wind generation to Idaho.

Barriers to Development under PURPA

The Wind Task Force identified three barriers to PURPA development in the state of Idaho. The first is assumptions included in developing the generic Surrogate Avoided Resource ("SAR") used to set the PURPA price developers receive for their power. The second is uncertainty around the availability and price of the SAR. The third barrier is how current PURPA contracts contain inadequate termination provisions, requiring the utility to include them in their long-term planning when in fact they might never enter commercial service.

PURPA Barrier 1 — Fairly Calculating Avoided Cost Price

Projects expected to generate up to 10 average megawatts ("aMW") of power per year are eligible to receive PURPA payments based on the value of the SAR. Inputs to the SAR model have been debated since its inception. Today the forward price curve for natural gas has the largest impact on the SAR price, making it the most controversial input to the SAR model. Uncertainty surrounding SAR inputs creates a similarly uncertain price signal for wind project developers. Furthermore, the SAR's valuation might not always reflect fully the avoided cost of a wind project.

For projects generating more than 10 aMW, payments are determined using a utility production dispatch or planning model tailored to individual project characteristics. This price is not known until a planning model run is completed for the individual project. Many believe that this price uncertainty has resulted in wind developers focusing on projects that are smaller than 10 aMW.

For the past several years wind developers have indicated the PURPA, or "avoided cost" rate is too low to cover the cost of a wind project; few projects have been built as a result. The last

[25] A PURPA developer is unable to dictate its sales price to the purchasing utility; it must accept the then-current avoided cost rate.

new wind PURPA contract was entered into in 2006, implying that current PURPA rates do not adequately support the construction of new wind generation.

Calculating an avoided cost rate, on its face, appears simple enough: what would a utility pay for power absent the resource being proposed? The reality is that calculating avoided costs, especially when considering renewable resources like wind, is not at all straight forward. Each new resource has unique attributes that are beneficial to the host utility relative to other resource choices. One example of this is the difference between the SAR—a gas-fired combined-cycle gas plant—and a wind plant. The SAR is subject to price variations in natural gas, one of the most volatile commodities traded today. Wind, on the other hand, has no price risk in that all of its fuel is free. By building a wind project instead of a gas plant, all other things equal, a utility's customers will benefit from being insulated against natural gas price fluctuations. Wind generation should obtain an avoided cost value for this benefit that a gas-fired resource would not. However, a wind project has no or very little capacity value relative to the gas plant, meaning that avoided costs applicable to wind should be granted zero or a very small avoided cost value for this benefit.

The current SAR methodology provides no avoided cost or allowance for transmission or interconnection. It is likely that whatever resource the PURPA project avoids will incur some transmission costs, but transmission costs are not considered in the current avoided cost pricing method. PURPA resources then can compete at a competitive disadvantage relative to resource options procured by the host utility through other processes. This disadvantage is especially acute in light of the fact that PURPA developers presently must pay for all interconnection and transmission upgrade costs associated with their projects.

The existing SAR resource in Idaho is highly dependent on the price assumptions for natural gas whose cost is very volatile. Additionally, some of cost drivers behind the SAR—for example, capital cost escalation—affect wind resources even more than the SAR. Avoided cost rates for 10 aMW and under PURPA projects are adjusted only when the Northwest Power and Conservation Council ("NPCC") updates its natural gas price forecast, or when the IPUC is petitioned by the utilities, developers, or other interested parties. PURPA rates respond quickly to natural gas price forecast changes; however, the NPCC natural gas price forecast does not follow a published schedule. It is modified when the NPCC elects to do so, oftentimes in support of its power plans published no less often than every 5 years. Updating other SAR assumptions through a petition of the IPUC requires hearings that can extend for many months to a year or more. The result is that the PURPA rate applicable to projects of up to 10 aMW in size can lag actual market conditions by years, potentially disadvantaging wind developers to the point that they choose to avoid Idaho all together.

PURPA Barrier 2 — PURPA Rate Uncertainty/Availability

Published PURPA rates have not been consistently available to wind generation projects in Idaho. Although projects up to ten average megawatts ("aMW") may receive published avoided cost rates, a two and one-half year a moratorium placed on wind reduced eligibility to 100 kilowatts while the IPUC evaluated the cost of integrating wind resources. This evaluation period likely reduced new PURPA wind development in the state during that period. Wind developers continue to fear future limitations on their access to published PURPA rates, thereby creating a barrier to wind generation.

PURPA Barrier 3 — Lack of Adequate PURPA Contract Termination Provisions

The current PURPA process allows contracts to be executed and then held almost indefinitely while no progress is made on the project. Termination provisions are included in the contract, but the business structure of many PURPA developers renders them weak.[26] From the developer's–except perhaps the developer with the stalled contract–perspective these stalled projects have the potential to reduce the value of projects later proposed to the utility. Some projects might not come to fruition simply because other projects are theoretically included in the electricity utility's resource stack.

From the utility's perspective, stalled PURPA contracts create phantom resources affecting its mission of acquiring least-cost resources. PURPA contracts are included in the utility's resource stack, and for planning purposes are generally assumed to enter service per the contract. Similar to the PURPA developer, the utility can find itself in a position where new development or resource purchase opportunities are passed over on the presumption that a PURPA contract will perform. Certainly this is the case between the time the PURPA contract is signed and the first delivery date identified in the PURPA contract.

List of Proposed Solutions

The Wind Task Force discussed various solutions to address PURPA barriers identified in this report.

Proposal Area 1 — Streamline the SAR Process and Update Regularly

The state could recommend that the IPUC, in conjunction with its regulated utilities, resource developers, and other interested parties, explore ways to streamline the calculation of avoided costs. It could also direct the same group to identify a means to evaluate and update the key variables, including natural gas, on an annual basis using the best information available at that time. Streamlining, combined with regular updates to key SAR variables would ensure that

[26] Many PURPA developers do not have balance sheets large enough to insulate a utility against default, and in many cases the assets of the developer are only what are tied up in the PURPA development. A PURPA developer might simply declare bankruptcy, leaving the utility and its customers with no compensation for default.

avoided cost rates are more reflective of current market conditions. Developers would then have access to avoided cost rates that use the latest trends in the marketplace that also are affecting the cost drivers of their wind projects.

Proposal Area 2 — Develop a Wind Surrogate Avoided Resource Model

Given that Idaho utilities have plans to acquire significant amounts of wind generation in the future, and the significant differences between the existing SAR resource and wind, the state could recommend that the IPUC, in conjunction with its regulated utilities, resource developers and other interested parties, consider the development of a SAR avoided cost model specific to wind generation projects. Wind projects would be eligible for this new avoided cost rate.

Proposal Area 3 — Value All Wind Resource Attributes in SAR Calculation

The state could recommend that the IPUC hold hearings to study, and to include in avoided cost rates, the benefits (e.g., fuel price risk, carbon mitigation, economic development) and costs (e.g., back-up capacity, wind integration) of wind resources relative to the current SAR, and account for them. The price could reflect the value of any green tags or renewable energy credits offered by the developer to the purchasing utility. Monetizing the environmental benefits of the wind project will help project economics and bring more wind development in the state.

Proposal Area 4 — Direct IPUC to Use High Gas Price Forecast for PURPA Rates

As a simplifying alternative to Proposal Area 3 above, the state could direct the IPUC to use the high NPCC natural gas price forecast for PURPA avoided cost calculations.

Proposal Area 5 — Make Pricing Methods for Large PURPA Projects More Transparent

The state could recommend that the IPUC hold hearings to study means for making the pricing process for larger PURPA resources more transparent. The resultant prices would reflect the benefits (e.g., fuel price risk, carbon mitigation, economic development) and costs (e.g., back-up capacity, wind integration) of wind resources relative to the modeled avoided cost resource used in the price comparison and account for them. Avoided cost prices could reflect the value of any green tags or renewable energy credits offered by the developer to the purchasing utility. Monetizing the environmental benefits of the wind project will help project economics and bring more wind development to the state. The IPUC could also be directed to require utilities to publish sample or proxy price schedules using this methodology on an annual basis or at a minimum on the utilities' IRP timelines to allow for regular auditing of the methods and results of the avoided cost pricing studies.

Proposal Area 6 — Reflect Interconnection Costs in Avoided Cost Rates

To compensate wind developers for costs they incur in interconnecting their projects to the transmission system—costs utilities would incur were they to procure a new resource

themselves—the state could ask the IPUC to sponsor a proceeding to evaluate how interconnection costs should be reflected in avoided cost rate calculations.

Proposal Area 7 — Include Termination Provisions in PURPA Contracts

The state could recommend that the IPUC require termination provisions in all PURPA contracts that include performance guarantees. Guarantees could be backed by letters of credit or other credit provisions in cases where a wind developer does not have the financial means to cover its obligations in the event of contract default. Any termination provisions and associated performance guarantee provisions would allow for a reasonable amount of time for a project to be built after contract execution.

Proposal Area 8 — Increase Published Rate-Eligible PURPA Projects Limit to 20 aMW

The state could recommend that the IPUC increase eligibility for PURPA SAR pricing to 20 aMW. Increasing the limit would enable projects up to 60 MW of nameplate capacity to be constructed, thereby providing better economies of scale for developers.

Task Force Recommendations

After considering its List of Proposed Solutions for barriers to PURPA development in the state, the Wind Task Force submits the following recommendation to the Idaho Strategic Energy Alliance Board of Directors for their consideration. The Wind Task Force believes that of its various recommendations in this report, eleven have the best potential to affect future wind development. All three PURPA recommendations fall into this category and therefore are identified with an asterisk.

** Recommendation 1 – Streamline the SAR Process and Update it Regularly*

Idaho could recommend that the IPUC, in conjunction with its regulated utilities, resource developers, and other interested parties, explore ways to streamline avoided cost calculations. The key variables, including natural gas, could be updated on an annual basis using the best information available at that time.

** Recommendation 2 – Require Performance Guarantees in All PURPA Contracts*

Idaho could recommend that the IPUC require termination provisions in all PURPA contracts signed by its regulated utilities. Such provisions would include performance guarantees backed, in cases where the wind developer does not have the financial means to cover their obligations in the event of project default, by letters of credit or other provisions.

** Recommendation 3 — Increase Published Rate-Eligible PURPA Projects Limit to 20 aMW*

Idaho could direct the IPUC to increase PURPA SAR published rate pricing eligibility from 10 aMW to 20 aMW. Increasing this limit would enable projects of up to approximately 60 MW of

nameplate capacity to be constructed, thereby providing better economies of scale for developers.

Variability

Variability presents a barrier to integrating large amounts of wind power. This barrier has the potential to limit overall wind development in Idaho. Wind variability is created primarily by: normal increases and decreases in generation due to continuously changing wind speed; large ramp events caused by storms and other weather events; and day-to-day variations due to diurnal fluctuations and seasonal variability. Variability of any kind complicates transmission system operations, leading to higher system costs and, where severe enough, compromising reliability. On a per-MW basis, wind generation can be ten times as variable as load. The impact of variability rises as more wind projects enter service, necessitating that all involved parties work diligently to minimize the impact of wind variability on transmission system operations.

Many wind variability impact studies—commonly known as wind integration studies—have quantified the effects of increased variability experienced by transmission system operators using current methodologies and operating methods. The studies explain that the value of wind should be reduced to account for its variability. A sample of Northwest studies conducted in 2006-07 reveals a range of costs from $3.72 - $7.92 per MWh.[27] At the low-end of that range was a study by Xcel-PSCo which assumed 10% wind capacity penetration.[28] At the high-end of that range was a study authored by EnerNex Corporation for Idaho Power Company which simulated a 30% penetration level.

Because of inherent variability, the wind and utility industries continue to study ways to reduce integration costs. Many possible solutions exist, including better forecasting of wind generation, the utilization of demand-side programs, geographical dispersion of the resource to limit short-term variations, the sharing of reserves between utilities that have differing wind generation profiles, and shortening the real-time market term so that transmission system operators can transact on a more frequent basis to balance operations affected by wind variability.

The Idaho Power study referenced above was conducted at the direction of the IPUC to support pricing qualifying facilities seeking to sell energy under PURPA. All three of Idaho's investor-owned utilities participated in the proceeding to determine an appropriate wind integration

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[27] See Comparison of Major Wind Integration Studies Completed 2003 – 2006, National Renewable Energy Laboratory, US DOE EERE and Operational Impacts of Integrating Wind Generation into Idaho Power's Existing Resource Portfolio, EnerNex Corporation, February 2007.

[28] Wind capacity penetration refers to the ratio of wind generation capacity to total system capacity. For example, if a system has 10MW wind generation capacity and 100MW total system capacity, its wind capacity penetration would be 10/100 = 10%.

cost for Idaho. The result of the proceedings was that PURPA wind generators selling their output in Idaho receive a discount to their rate.[29]

Barriers to Managing Wind Variability

The Wind Task Force identified three barriers related to wind generation variability. First is the resource's lack of dispatchability. System operators must respond to variations in wind generation, unlike most other generation resources that may be used to respond to other variations in transmission system operations. Second, Northwest wind projects create more electrical energy at night when there is less need for the power and lack dependable on-peak capacity, requiring back-up peaking generation. Third, current wind generation forecasting technology is not accurate, requiring system operators to hold in reserve substantial amounts of generation. This reservation is very expensive, accounting for a large component of the integration costs described above.

Variability Barrier 1 — Wind Resources are not Dispatchable

Transmission system operators have never controlled the majority of their system loads; but, they have been able to respond to load changes by modifying the operation of generation resources under their control. Generation resources with control flexibility are known as "dispatchable" resources. Replacing dispatchable resources with non-dispatchable resources like wind adds a level of variability almost unprecedented in the history of transmission system operations.[30] Managing system variability challenges transmission system operations and adds substantially to its cost.

Variability Barrier 2 — Lack of Dependable Capacity and Off-Peak Generation Bias

In many wind regimes, including the Northwest, wind power generation does not peak during periods of high electricity consumption, or peak demand. By not peaking during the day when demand is highest, wind generation values are lower than were the opposite true.

Northwest peak loads coincide with extreme hot and cold temperatures generally not correlated with the changing weather patterns necessary to create wind. Absent on-peak wind capacity contributions, transmission system operators must utilize other generation resources to meet system peaking periods, increasing the overall cost of serving customer loads. Some utilities presently are assuming that wind generation facilities on their system contribute no capacity to meet system peak events, and plan to construct additional resources to ensure

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[29] The Idaho Power Company and Avista Corporation integration charges are calculated as a percentage (7%, 8% or 9%) of the current 20-year, levelized, avoided cost PURPA rate, subject to a cap of $6.50/MWh. The integration costs which charged to wind generators situated in Rocky Mountain Power's service territory is $5.10/MWh.

[30] Some loads historically served by utilities have high variability. The best example is an arc furnace. It can add or subtract from the grid tens of megawatts of load almost instantaneously. In most cases these loads have stringent utility notification provisions, or pay higher rates to account for their impacts.

reliability. On a region-wide basis there is the potential for wind site diversity to allow some capacity contribution for wind. Present estimates of regional on-peak capacity range from 5 to 20 percent.

Variability Barrier 3 — Wind Forecasting Technology Provides Poor Forecasts

As explained earlier in this section, managing system variability increases system operation costs significantly. As wind energy's penetration levels have increased over the past 10-years, utility companies and other transmission system operators have attempted to address rising variability by using new wind forecasting techniques.

Unfortunately, forecasts remain relatively unreliable, and forecast error rates remain high. State-of-the-art wind forecasting techniques cannot beat simple persistence forecasts prior to 2 hours before delivery, the most critical and costly timeframe. Forecast errors out 24 hours can average 30%, a level approximately ten times higher than load forecasting errors.

Adding to forecast error is that the region has little information on wind generation patterns in general. Unlike hydroelectricity records that exist back as far as one-hundred years or more, wind generation and its study is relatively new. Absent good information and an operating history, wind forecasting efforts are limited.

List of Proposed Solutions

Wind variability cannot be eliminated. The Wind Task Force has identified a number of potential solutions that might better enable the overall transmission system to manage the variability.

Proposal Area 1 — Greater Utility Cooperation to Integrate Wind

The amount of wind that can be integrated into a transmission system operators' system is limited in part by the need for additional automatic generation control ("AGC") and within-hour load following. The ACE Diversity Interchange Program now being implemented across the Northwest assists member utilities integrate wind by diversifying wind variation across control areas in the short-term AGC timeframe. Sharing regulation resources region-wide should reduce the need for additional resources and reduce the cost for wind integration.

Two utility cooperation options hold promise to reduce the impact of wind variability on system operators: a) pooling all Northwest utility balancing resources, so that all serving load with wind share its variability; and b) shifting the responsibility of wind variation from one constrained system to another that is less constrained (dynamic scheduling). The IPUC could encourage its regulated utilities to consider pooling and dynamic scheduling options to lower wind integration costs.

Proposal Area 2 — Demand-Side Management Options

With adequate notice and incentives, many utility customers can respond to load and resource changes by shutting down or reducing their consumption for a prescribed time period. Two barriers to its use have been insufficient market value relative to other options available from the generation system, and technology limitations. With a rising need for dispatchable resources, DSM resources could become cost-effective for managing wind variability.[31] To access this resource, the IPUC could work with its regulated utilities to evaluate potential new load-interruption programs with an eye to providing capacity for wind integration.

Proposal Area 3 — Time-of-Use Pricing

Where consumers are charged rates commensurate with the actual costs borne by the utility company, rates are higher during periods of peak demand. This pricing approach is known as time-of-use ("TOU") pricing. Under TOU pricing, current customers consuming a larger share of their energy during peak system conditions pay more. Those that consume less pay less.

Curtailing consumption during times of system peak to periods of lower demand and costs reduces the magnitude of the peaks and frees capacity for wind integration. In the long run TOU provides an efficient price signal for consumers to modify their consumption behavior in a manner that benefits all customers when considered together. Unfortunately consumers who have no choice but to consume power during peak periods lose under a TOU pricing scheme. This fact has limited the offering of TOU programs in Idaho. Idaho Power's present TOU pilot program for its customers in Emmett is a good example. TOU pricing exists, but the price incentives offered under that program do not reflect fully the costs of on-peak energy consumption. The program's impact on system operations is therefore limited.

To provide additional peaking capacity for wind integration, the IPUC could direct its utilities to study TOU pricing for wind integration, including all costs and benefits. It could also consider the impact of TOU on those consumers unable to shift consumption in an effort to minimize their impacts. To the extent that the overall benefits of TOU exceed its costs, the IPUC could then develop rate schedules and implement the program for all of its regulated utilities.

Proposal Area 4 — Research and Development Funding

Energy storage technologies have the potential to lower wind integration costs and help shift its transmission system contributions into the higher-valued on-peak timeframes. As discussed above, wind variability would benefit greatly from better forecasting methods, as wind forecasting industry is in its infancy and could benefit from further research and development.

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[31]The DSM measures discussed here have the potential to benefit system operators generally; they are not solutions unique to wind.

Today energy storage is very costly and would benefit from further research and development. Wind forecasting would also benefit from further research and development to the extent new methods could be used to better its accuracy. Research avenues available to the state include the Idaho Center for Advanced Energy Studies, the Idaho Higher Education Research Council, and the National Science Foundation's Experimental Program to Stimulate Competitive Research, in which Idaho is eligible to participate. The state could develop a ten-year research and development fund focused on wind storage technologies.

Proposal Area 5 — New Market Products and Structures

Wind integration costs are high due to the lack of a robust Northwest market for ancillary services, and the comparatively long timeframe over which system operators must hold their schedules (i.e., one hour). It is not likely that Idaho by itself can affect either of these issues greatly. It can, however, do its part through regional efforts to move the marketplace in a direction that benefits wind development.

The state could implement the following options to enable more wind generation by:

1. Encouraging Idaho electricity utilities to participate in regional efforts to help form a Northwest capacity and ancillary services market.

2. Encouraging Idaho electricity utilities to participate in regional efforts to help form a short-term marketplace where trades are made for periods of less than one hour. A 2007 study by Avista showed that a 10-minute marketplace could reduce wind integration costs by 60%.[32] Precedent for shorter-term markets exists; in many areas of the United States and around the world electricity markets trade on five- and ten-minute intervals.

3. Sponsoring a regional forum on capacity and ancillary service markets, and on the benefits of moving the Northwest to a five- or ten-minute wholesale marketplace.

Task Force Recommendations

After considering its List of Proposed Solutions for barriers to managing wind variability in the state, the Wind Task Force submits the following recommendation to the Idaho Strategic Energy Alliance Board of Directors for their consideration. The Wind Task Force believes that of its various recommendations in this report, eleven have the best potential to affect future wind development. Three of these fall into the variability category and are identified with an asterisk.

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[32] *"Final Report Avista Corporation Wind Integration Study,"* Enernex Corporation, 2007, https://www.avistautilities.com/inside/resources/irp/electric/Documents/AvistaWindIntegrationStudy.pdf

** Recommendation 1 – Encourage Balancing Authority Pooling*

Idaho, through the IPUC could encourage its regulated utilities to pool their resources and use dynamic scheduling options to lower wind integration costs.

** Recommendation 2 — Encourage Northwest Ancillary Services Markets*

Idaho could encourage its electricity utilities to participate in regional efforts to help form a Northwest capacity and ancillary services market.

** Recommendation 3 — Encourage a Short-Term Spot Market for Power*

Idaho could encourage its electricity utilities to participate in regional efforts to help form an electricity spot market trading in time intervals of five or ten minutes.

Recommendation 4 – Value Geographical Diversity in Resource Acquisition Decisions

Idaho, through the IPUC, could direct its regulated utilities to consider the benefits of geographical diversity in planning and resource procurement processes; it should consider such information in prudency determinations.

Recommendation 5 — Evaluate Demand-Side Management Options for Wind Integration

Idaho, through the IPUC, could direct its regulated utilities to evaluate potential new load-interruption programs with an eye to providing capacity for integrating wind generation.

Recommendation 6 — Evaluate Time-of-Use Pricing For Wind Integration

To provide additional peaking capacity for wind integration, Idaho, through the IPUC, could direct its utilities to study TOU pricing for wind integration, including all costs and benefits. To the extent that the overall benefits of TOU exceed its costs, the IPUC could direct its utilities to develop time-of-use rate schedules for all of its regulated electricity utilities.

Recommendation 7 — Fund Research and Development for Energy Storage Technologies

Idaho could develop a ten-year research and development fund focused on energy storage technologies that have the potential to benefit wind (and other renewable energy) generation; specifically with regard to managing the variability of the resource.