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IDAHO PUBLIC
UTILITIES COMMISSION

Attorneys for Exergy Development Group of Idaho LLC

BEFORE THE
IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE PETITION OF)	
AVISTA CORPORATION FOR AN ORDER)	CASE NO. AVU-E-07-02
REVISING AVISTA CORPORATION'S)	
OBLIGATIONS TO ENTER INTO)	
CONTRACTS TO PURCHASE ENERGY)	EXERGY DEVELOPMENT GROUP
GENERATED BY WIND-POWERED SMALL)	OF IDAHO LLC'S COMMENTS
POWER GENERATION FACILITIES)	

COMES NOW, Exergy Development Group of Idaho LLC ("Exergy") by and through its attorney of record, Peter J. Richardson, and pursuant to that notice issued by the Idaho Public Utilities Commission ("Commission") on August 22, 2007, as amended on September 19, 2007, and hereby provides its Comments in response to Avista Company's ("Avista" or the "Company") above captioned Petition. In support hereof Exergy says as follows:

I

SUMMARY OF EXERGY'S POSITION

Modified procedure should be utilized in this docket for the sole purpose of denying Avista's Petition. Absent outright denial, Exergy opposes the use of modified procedure to prosecute this highly complex and technical case.

Exergy Development Group of Idaho LLC's Comments AVU-E-07-02

II

BACKGROUND AND STANDARD OF REVIEW

This Commission's rules require that a decision to proceed under modified procedure be based upon a finding that "the public interest may not require a hearing to consider the issues presented." IPUC Rules of Procedure IDAPA 31.01.01.201. (herein "Rule") The Commission's decision must be based on the record before it as detailed in Rule 281 which provides that:

The Commission bases its decisions and issues its orders on the hearing record (excluding exhibits denied admission), the Commissioners' record and items official noted.

The "Commissioner's record" consists of "all pleadings, orders, notices, briefs, proposed orders and position papers." Rule 284.01 The Commissioner's record also includes the "complete hearing record of transcripts and exhibits." Rule 285.

The Commission is a fact finding, quasi-legislative body authorized to investigate and determine issues presented by a utility's petition for increased (changed) rates. The Commission's findings must be supported by competent and substantial evidence. *Application of Pacific Tel. & Tel. Co.*, 71 Idaho 476, 480, 233 P.2d 1024 (1951).

The substantive record in this docket, as it relates to wind integration costs, consists solely¹ of Avista's Petition and the attachment thereto. The attachment is a document prepared by Avista's hired experts entitled "Final Report Avista Corporation Wind Integration Study" (herein "Study") The ultimate conclusion of the study is that Avista will experience high costs for which it is not compensated in order to integrate wind into its electrical system.

¹ Yesterday's filings in this docket were not made in time for Exergy to respond by the close of comment according to the Notice. Exergy will respond according to Commission direction.

In its Petition, Avista seeks a reduction in the Commission approved avoided cost rates by 12% as a percentage reduction to be applied against scheduled avoided cost rates. The level of wind integration costs depends, according to Avista's Study, on the magnitude of wind power connected to its system. Study p. xi. Avista's proposed Wind Integration Cost Adjustment is set based on the fiction that there are 400 megawatts of installed wind capacity on its system. Petition p. 7-8.

For the reasons stated below, Exergy asserts that Avista's Petition is not supported by substantial and competent evidence and that a full hearing must be held by this Commission prior to issuing its order declaring what Avista's wind integration rate is, or indeed if Avista has a wind integration cost in the first place.

III AVISTA'S PETITION SHOULD BE DENIED OUTRIGHT

Modified procedure in this docket is appropriate only if the outcome is the denial of Avista's Petition.

The gist of Avista's Petition is that large amounts of wind generation on its system will result in high costs to integrate that intermittent resource in a reliable manner. Avista has not averred that it HAS a large amount of wind connected to its system. It avers that it MAY have a large amount of wind at some time in the future. It has not averred that it currently is experiencing any problems with integrating wind into its system at this time. Indeed, Avista's proposed Wind Integration Rate is based on the assumption that it has 400 megawatts of installed wind. In reality it has no megawatts of installed wind. This is the flip side of retroactive ratemaking. Avista is asking that today's rates be set based upon contingent events that may or may not happen at some point in the future. Given that the IOU's in Idaho have (a) successfully stymied all new wind development in Idaho for over two years and (b) that it only has no

Exergy Development Group of Idaho LLC's Comments AVU-E-07-02

megawatts of wind installed on its system today; its assertion that it must immediately impose a Wind Integration Rate based on four hundred megawatts of wind on its system is simply not credible. The Petition should be denied.

Setting rates based on assumptions that are known to be false would violate the most basic of ratemaking tenants. To that end, setting rates to be effective immediately based on a contingent that has not occurred, may not occur and if it does occur, it may not do so for many years is simply reckless and illegal. Idaho Code Section 61-622 requires a showing that “any rate” be “justified”. Setting a rate to recover a non-existent cost is unjustifiable.

An alternative to denying Avista’s Petition outright, would be to implement a system by which the Wind Integration Rate varies as the company’s wind integration costs vary (both up and down). It is widely anticipated that integration costs may go up as penetration levels go up. On the other hand it is also widely anticipated that wind integration costs will go down as utilities gain experience with this renewable resource. Setting a fixed rate today based on an assumed penetration rate of almost five hundred megawatts is, candidly, a blunt, unsophisticated and inaccurate attempt to solve for a problem that doesn’t exist at this time, and indeed, may never exist.

If the Commission chooses to proceed with a wind integration rate that actually is an attempt to accurately reflect wind integration costs at the time they occur, it would have to set a variable wind integration rate. Such a rate would need to have a ceiling in order to provide certainty to the developer that the project can be financed without the potential for an unlimited and unknown reduction in operating revenues. That ceiling would presumably be the expected wind integration rate at an assumed build-out of wind projects on the system. The ceiling would not be a target, but rather a cap above which the wind integration cost rate would not exceed. Of

course, working out the details of such a program would take a process and require a record be developed before the Commission for review and approval. Modified procedure is not the appropriate vehicle for developing such a record.

IV MODIFIED PROCEDURE IS INAPPROPRIATE

Avista filed its Petition in this matter on March 30, 2007, as a result of failing to reach a settlement of the issues raised in Idaho Power's wind integration suspension proceeding in Docket No. IPC-E-05-22 which was opened back in June of 2005 and in which Avista actively participate. In that docket, in which Avista participated and supported Idaho Power's request that the Commission initiate a "suspension of the company's obligation under . . . PURPA to enter into new contracts to purchase energy generated by qualifying wind-powered small power production facilities." Order No. 29872 at p. 1. (the "Suspension Docket") Technically, this Commission did not suspend the Company's obligations under PURPA. Rather, it eliminated the opportunity for any wind QF larger than 100 kw to entitlement to the Commission's published avoided cost rates. The real-world effect of the Suspension Docket was to excuse the company's obligations under PURPA to offer its avoided cost rates to qualifying wind power small power production facilities.

The Commission observed that:

Based on the record established in this case the Commission finds reason to believe that wind generation presents operational integration costs to a utility different from other PURPA qualified resources. We find that the unique supply characteristics of wind generation and the related integration costs provide a basis for adjustment to the published avoided cost rates, a calculated figure that may be different for each regulated utility. The procedure to determine the appropriate amount of adjustment, we find, and the identification of what studies, if any, need to be performed to provide such a number is a matter appropriate for further proceedings. The record reflects that a wind integration study, if required, may take six months to develop. Avista has asked for a suspension period from six to nine months.

Order No. 39839 at p. 8. Emphasis provided.

Twenty six months later we are asked to comment on whether the wind integration study filed in this docket accomplishes the goals established for all three IOUs in IPC-E-05-22. The intervening two years, during which the wind industry in Idaho has been effectively frozen, have seen construction costs skyrocket and have cost Idaho many millions of dollars in lost economic benefits and will cost Idaho many untold millions into the future due to the lost opportunities suffered by the wind industry in this state. With that said, it is nevertheless critical that if this Commission decides to impose a wind integration rate on wind powered QFs, that it get it right the first time. That is one reason why Exergy opposes the use of modified procedure in this matter for all outcomes except for a denial of the petition.

In its final report to the Commission² regarding progress in working with interested parties to reach a consensus settlement of wind integration costs in Idaho, Idaho Power provided a list of individuals and firms who participated in its wind integration workshops. The participants included Avista and the following individuals, companies, state agencies, federal agencies, advocate groups, wind developers and public utilities:

Advocates for the West
Avista
Batt & Fisher
B.R.E. Inc.
Cassia Wind
Elmore County Agribusiness
Energy Vision
Exergy
Hanson, John
Idaho National Laboratory
Avista
Idaho Public Utilities Commission
Idaho Wind
Idaho Wind Farms

² IPC-E-05-22 filed January 31, 2006.

IDWR-Energy Division
Magic Wind
McDevitt & Miller
NW Energy Coalition
PacifiCorp
Paine Hamblen
Renaissance Engineering
Renewable Northwest Project
Richardson & O'Leary
Ridgeline Energy
Snake River Alliance
Windadvantage
Windland
Windlogics
Wirt, John

After five workshops and settlement conferences and with the combined efforts of the above list of experts no consensus was reached. Avista's current filing is not the result of a consensus – either as to methodology or its ultimate conclusions. The wind development industry is opposed to Avista's filing because the industry does not believe it accurately reflects Avista's integration costs.

Attached is a compilation (Attachment A) of wind integration study results from multiple jurisdictions indicating that, on its face, Avista's wind integration rate is wildly inaccurate. The table was prepared by Dr. Reading as part of a search of the literature on comparable wind integration rates.³ Avista's integration rate⁴ is approximately 50% higher as the next highest integration rate Dr. Reading was able to locate. In some instances it is more than sixteen times higher than other utility wind integration costs. While the comparison is not designed to indicate what Avista's integration costs actually are, it is offered to show that an evidentiary hearing is necessary in order to determine whether the assumptions and inputs contained in Avista's study

³ Accompanying the table are supporting documents from which the table was derived.

⁴ Based on current levelized avoided costs of approximately \$62 MW.


are fair, just and reasonable. The attached table suggests that such inputs may actually overstate Avista's true wind integration costs. The validity of Avista's wind integration rate should be subjected to close Commission scrutiny. Avista's study contains many factual assertions that have not been tested nor has this Commission created a record upon which such assumptions have been subject to review.

Avista expresses its wind integration costs as a percentage of the Commission approved avoided cost rate. Yet it has offered no nexus between avoided cost rates and the costs of providing ancillary services to firm intermittent resources. Exergy disputes the assertion that wind integration costs have anything whatsoever to do with the cost of Avista constructing and operating the Commission mandated surrogate avoidable resource, a natural gas fire turbine. As result of Avista's misguided effort to tie its wind integration cost to the Commission approved avoided cost rate, the wind industry will be penalized every time avoided cost rates are increased without any consideration whatsoever of what the actual wind integration costs may or may not be.

For all of the foregoing, Exergy respectfully requests that Avista's Petition be denied or in the alternative that a full evidentiary hearing be conducted to investigate the true level of wind integration costs for the Avista system.

Respectfully submitted this 5th day of October 2007.

RICHARDSON & O'LEARY PLLC

By 
Peter J. Richardson
Attorneys for Exergy Development Group
of Idaho, LLC

ATTACHMENT A

Recent Studies of Wind Integration Costs

\$/MWh								Source
Date	Study	Penetration %	Regulation Costs	Load Following Cost	Unit Commitment Cost	Gas Supply	Total Impact	
2003	Xcel-UWIG	3.5%	\$0.00	\$0.41	\$1.44		\$1.85	DOE, NERL
2003	We Energies	4.0%	\$1.12	\$0.09	\$0.69		\$1.90	DOE, NERL
2003	We Energies	29.0%	\$1.02	\$0.15	\$1.75		\$2.92	DOE, NERL
2004	Xcel-MNDOC	15.0%	\$0.23		\$4.37		\$4.60	DOE, NERL
2004	VTT-Scandinavia	10.0%					\$1.29	RNP
2004	VTT-Scandinavia	20.0%					\$2.58	RNP
2005	PacificCorp	20.0%	\$0.00	\$1.60	\$3.00		\$4.60	DOE, NERL
2005	Puget Sound	10.0%					\$4.05	RNP
2006	CA RPS	4.0%	\$0.45				\$0.45	DOE, NERL
2006	Xcel-PSCO	10.0%	\$0.20		\$2.26	\$1.26	\$3.72	DOE, NERL
2006	Xcel-PSCO	15.0%	\$0.20		\$3.32	\$1.45	\$4.97	DOE, NERL
2006	MN-MISO						\$4.41	DOE, NERL
2006	MN/MNDOC	20.0%	\$0.11		\$2.00		\$2.11	Renewable Energy Consulting Services, NREL
2006	MN/MNDOC	34.0%	\$0.23		\$4.18		\$4.41	Renewable Energy Consulting Services, NREL
2007	GE/Pier/CaIAP	20.0%	\$0.69				\$0.69	NREL
	BPA/Hirst	7.0%	\$0.19	0.28	\$1.40		\$1.87	Renewable Energy Consulting Services, NREL

U.S. Department of Energy
Energy Efficiency
and Renewable Energy

Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2006

May 2007



New Studies Find That Integrating Wind into Power Systems Is Manageable, But Not Costless

During the past several years, there has been a considerable amount of analysis on the potential impacts of wind energy on power systems, typically responding to concerns about whether the electrical grid can accommodate significant new wind additions, and at what cost. The sophistication of these studies has increased dramatically in recent years, resulting in a better accounting of wind's impacts and costs (recall that these "integration costs" were not included in the busbar wind power prices presented earlier).

Table 6 provides a selective listing of results from major wind integration studies completed from 2003 through 2006. Because methods vary and a consistent set of operational impacts has not been included in each study, results from the different analyses are not perfectly comparable. Nonetheless, the key findings of two major new studies completed in 2006 in Colorado and Minnesota are broadly consistent with those in earlier work, and (at a minimum) show that wind integration costs are generally approximately \$5/MWh, or less, for wind capacity penetrations³⁰ up to about 15% of the local/regional peak load in which the wind power is being delivered.³¹ Regulation and load-following impacts are generally found to be small, whereas the impacts of wind on unit commitment are more significant.³²

Transmission Is an Increasingly Significant Barrier to Wind, but Solutions Are Emerging

Relatively little investment has been made in new transmission over the past 15 to 20 years, and in recent years it has become clear that lack of transmission access and investment are major barriers to wind development in the U.S. New transmission facilities are particularly important for wind resource development because of wind's locational dependence and distance from load centers. In addition, there is a mismatch between the short lead times for

Table 6. Key Results from Major Wind Integration Studies Completed 2003-2006

Date	Study	Wind	Regulation	Cost (\$/MWh)			TOTAL
		Capacity Penetration		Load Following	Unit Commitment	Gas Supply	
2003	Xcel-UWIG	3.5%	0	0.41	1.44	na	1.85
2003	We Energies	4%	1.12	0.09	0.69	na	1.90
2003	We Energies	29%	1.02	0.15	1.75	na	2.92
2004	Xcel-MNDOC	15%	0.23	na	4.37	na	4.60
2005	PacifiCorp	20%	0	1.6	3	na	4.60
2006	CA RPS (multi-year)	4%	0.45*	trace	na	na	0.45
2006	Xcel-PSCo	10%	0.2	na	2.26	1.26	3.72
2006	Xcel-PSCo	15%	0.2	na	3.32	1.45	4.97
2006	MN-MISO 20%	31%	na	na	na	na	4.41**

* 3-year average

** highest over 3-year evaluation period

Source: National Renewable Energy Laboratory.

developing wind projects and the lengthier time often needed to develop new transmission lines. Furthermore, wind's relatively low capacity factor can lead to underutilization of new transmission lines that are intended to only serve wind. The question of "who pays?" for new transmission is also of critical importance to wind developers and investors. Transmission rate pancaking, charges imposed for inaccurate scheduling, and interconnection queuing procedures have also sometimes been identified as impediments to wind capacity expansion.

A number of developments occurred in 2006 that promise to help ease some of these barriers over time. The U.S. DOE issued a national transmission congestion study that designated southern California and the mid-Atlantic coastal area from New York City to northern Virginia as "critical congestion areas." Under the Energy Policy Act of 2005 (EPA 2005), the U.S. DOE can nominate National Interest Electric Transmission Corridors, and the Federal Energy Regulatory Commission (FERC) can approve potential new transmission facilities in these corridors if states do not act within one year, or do not have the authority to act, among other conditions.³³ Separately, FERC issued a rule allowing additional profit incentives for transmission owners on a case-by-case basis, also as required by EPA 2005, and thereby potentially encouraging greater transmission investment.

In the West, the Western Governors Association adopted a policy resolution through its Clean and Diversified Energy Advisory Committee that included a goal of 30,000 MW of clean energy by 2015, with potentially significant contributions from wind power. The recommendations of this committee to advance wind included

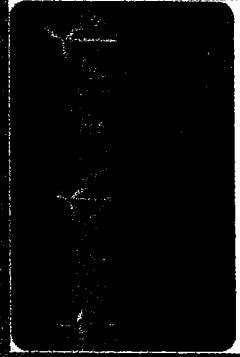
³⁰ Wind penetration on a capacity basis (defined as nameplate wind capacity serving a region divided by that region's peak electricity demand) is frequently used in integration studies. For a given amount of wind capacity, penetration on a capacity basis is typically higher than the comparable wind penetration in energy terms.

³¹ The recently completed study in Minnesota found that a 25% wind penetration within the state, based on energy production (31% based on capacity), would cost \$4.41/MWh or less. This low cost at such a high penetration rate is caused, in part, by the extensive interactions with the Midwest Independent System Operator (MISO) markets. The low cost found in the California study is partly a reflection of the limited number of cost factors that were considered in the analysis.

³² A number of additional wind integration analyses are planned for 2007, including a study of even-higher wind power penetrations in Colorado, the completion of the California Intermittency Analysis Project, and further work in the Pacific Northwest. Studies evaluating wind integration in the Southwest, and perhaps throughout the West, are also in the early planning stage.

³³ The U.S. DOE has since issued draft National Interest Electric Transmission Corridor designations for the two regions identified above and, as of this writing, is receiving comments on this draft designation.

Integrating Wind Power into the Electric Power System



Ed DeMeo
Renewable Energy
Consulting Services, Inc.
Technical Advisor, Utility Wind
Integration Group



Michael Milligan
National Renewable Energy
Laboratory
Consultant, National Wind
Technology Center

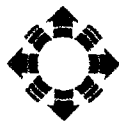
Michigan Public Service Commission Wind Forum

April 25, 2007

Lansing, Michigan

System Operating Costs Impacts: Results from Recent Studies (\$/MWh)

Study	Penetra- tion (%)	Regula- tion	Load- Follow	Unit- Commit	Total Impact
UWIG/Xcel	3.5	0	0.41	1.44	1.85
Pacificorp	20	0	1.6	3.0	4.6
BPA/Hirst	7	0.19	0.28	1.40	1.87
We Energies	29	1.02	0.15	1.75	2.92
Xcel/PSCO	15	0.20	0	4.77	4.97
Xcel/MNDOC	15	0.23	0	4.37	4.60
MN/MNDOC	20	0.11	0	2.00	2.11
MN/MNDOC	34	0.23	0	4.18	4.41



National Renewable Energy Laboratory

*A national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy*

Innovation for Our Energy Future



WECC Operating Impacts

**WindPowering America
Summit
June 6, 2007**

Michael Milligan

National Wind Technology Center
National Renewable Energy Laboratory
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NREL is operated by Midwest Research Institute • Battelle

Comparison of Cost-Based U.S. Operational Impact Studies

Date	Study	Wind Capacity Penetra- tion (%)	Regula- tion Cost (\$/MWh)	Load Following Cost (\$/MWh)	Unit Commit- ment Cost (\$/MWh)	Gas Supply Cost (\$/MWh)	Total Operating Cost Impact (\$/MWh)
May '03	Xcel-UWIG	3.5	0	0.41	1.44	na	1.85
Sep '04	Xcel-MNDOC	15	0.23	na	4.37	na	4.60
June '06	CA RPS Multi- year	4	0.45*	trace	na	na	0.45
Feb '07	GE/Pier/CAIAP	20	0-0.69	trace	na***	na	0-0.69***
June '03	We Energies	4	1.12	0.09	0.69	na	1.90
June '03	We Energies	29	1.02	0.15	1.75	na	2.92
2005	PacifiCorp	20	0	1.6	3.0	na	4.60
April '06	Xcel-PSCo	10	0.20	na	2.26	1.26	3.72
April '06	Xcel-PSCo	15	0.20	na	3.32	1.45	4.97
Dec '06	MN 20%	31**					4.41**

* 3-year average; total is non-market cost

** highest integration cost of 3 years; 30.7% capacity penetration corresponding to 25% energy penetration;
24.7% capacity penetration at 20% energy penetration

*** found \$4.37/MWh reduction in UC cost when wind forecasting is used in UC deployment. National Renewable Energy Laboratory

Renewable
Northwest
Project

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Members

Q-Phase Energy Services

Portland Wind
Energy Association

Sequoia Environmental
Foundation

Center for
Energy Efficiency and
Renewable Technologies

CH2M Hill

Idaho Utility Board

David Evans & Associates

Future Energy America

FE Energy, Inc.

Geothermal
Resource Council

GE Energy

Great Northern Energy

Green Wind Energy

Inter-Stewarding

Montana Environmental
Interfaith Center

Montana Public Interest
Resource Group

Natural Resources
Defense Council

NW Energy Connection

Northwest
Environmental Advocates

Oregon State Public
Interest Resource Group

Orion Energy

PJM Energy, Inc.

Portland Energy
Innovation, Inc.

PBS America
Development, Inc.

Steel River, LLP

Terra Windcon
Wind Technology, Inc.

Washington
Environmental Council

Washington State Public
Interest Resource Group

Washington Resource Alliance

Western Wind Power

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IDaho PUBLIC
UTILITIES COMMISSION

February 9, 2007



Renewable Northwest Project

Jean D. Jewell, Secretary
Idaho Public Utilities Commission
472 West Washington Street
P. O. Box 83720
Boise, ID 83720-0074
Via email

Re: Operational Impacts of Integrating Wind Generation into Idaho Power's
Existing Resource Portfolio

Dear Ms. Jewell:

We appreciate the time and effort Idaho Power Company expended in preparing their study *Operation Impacts of Integrating Wind Generation into Idaho Power's Existing Resource Portfolio* (Study). In addition, Idaho Power Company's analysts have been generous in sharing their intermediate results and discussing their methodology with the Northwest Wind Integration Action Plan (NWIAP) Peer Review Committee of which we are participants. Unfortunately, due to perceived urgency felt by Idaho Power, the Study was filed with the Idaho Commission prior to completing the NWIAP peer review process. Taking extra time would allow parties on the Peer Review Committee to have confidence in the results.

We believe this report is premature and we *urge the Commission not to accept it until the peer review process is complete*. We also feel it is critical not to base any other decisions, such as those proposed in Idaho's filing on PURPA rules, on the study results until the report has been fully vetted. Allowing Idaho Power extra time, and extra funding for their consultant if needed, is important to this process. We also hope the Commission will encourage Idaho Power to continue to share complete details of their wind data and analysis methodology with regional stakeholders.

The timing was particularly unfortunate because the peer review group identified some areas of concern in the calculations and methodology that had the effect of systematically overestimating the reserve requirements. The peer review committee wished to investigate further. Some of the concerns identified include:

Inflated Market Price Data. We appreciate that Idaho Power was interested in understanding the differences in system operations under low, average, and high water years. However, the market prices that corresponded to the average water year are inflated because of the 2000-2001 energy crisis. These high prices result in integration costs for those years that are unreasonably high.

Attachment

Recent Wind Integration Studies Summary

Date	Study	Penetration %	Operating Cost Impact (\$/MWh)
2005	PacifiCorp	20	4.6
Mar 2005	Puget Sound Energy	10	4.05
May 2003	Xcel-UWIG	3.5	1.85
Sep 2004	Xcel-MNDOC	15	4.6
Jun 2003	WE Energies	4	1.9
Jun 2003	WE Energies	29	2.92
Apr 2006	Xcel-PSCo	10	3.72
Apr 2006	Xcel-PSCo	15	4.97
Nov 2006	Enernex- MN	15*	2.11
Nov 2006	Enernex- MN	25*	4.41
Dec 2004	VTT- Scandinavia	10*	1.29**
Dec 2004	VTT- Scandinavia	20*	2.58**

Notes

*Penetration based on MWh generation / MWh load

**Euros/MWh converted to dollars @ 1.29 Euro/dollar

Sources:

"Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States," Parsons/Milligan et al, NREL, July 2006

"Final Report- Minnesota Wind Integration Study," Minnesota Public Utility Commission, November 30, 2006

"The Impact of Large Scale Wind Power Production on the Nordic System," Holtinen, VTT Processes, December 2004

"Short-term Operational Impacts of Wind Generation on the Puget Sound Energy Power System", Golden Energy Services, Inc., March 3, 2005.

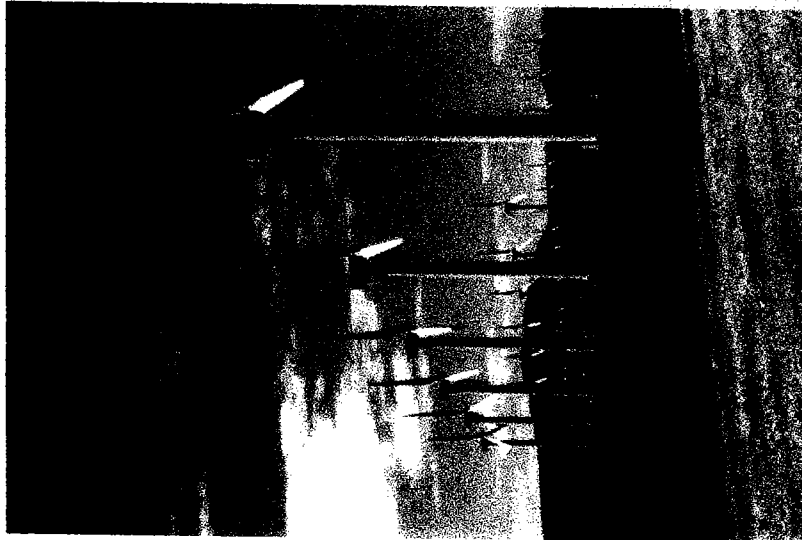


NREL National Renewable Energy Laboratory

*A national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy*

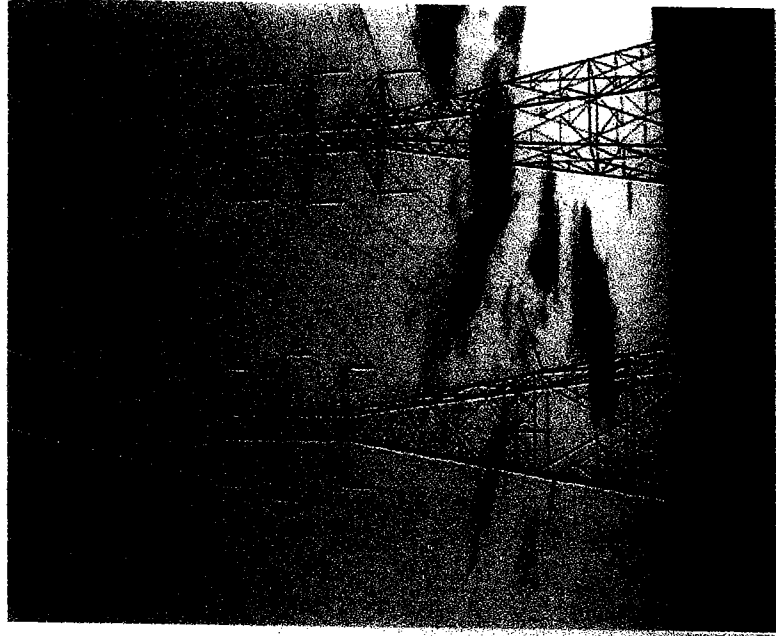
Innovation for Our Energy Future

Wind-Generated Electricity: Technology, Integration, Transmission Issues



**PNWER Annual Meeting
Anchorage, Alaska
July 24, 2007**

Brian Parsons
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NREL is operated by Midwest Research Institute - Battelle



Comparison of Cost-Based U.S. Operational Impact Studies

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* 3-year average; total is non-market cost

** highest integration cost of 3 years; 30.7% capacity penetration corresponding to 25% energy penetration;
24.7% capacity penetration at 20% energy penetration

*** found \$4.37/MWh reduction in UIC cost when wind forecasting is used in UC decisions

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this day, October 5, 2007, I caused a true and correct copy of the foregoing **EXERGY DEVELOPMENT GROUP OF IDAHO LLC COMMENTS AVU-E-07-02** to be served by the method indicated below, and addressed to the following:

Ms. Jean Jewell
Commission Secretary
Idaho Public Utilities Commission
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