

Electricity, Resources, & Building Systems Integration Center

Distributed Energy Publications

2005 - 2010

Fact Sheets

1. [Transmission and Grid Integration: Electricity, Resources, & Building Systems Integration](#) (2009); NREL Report No. FS-550-46187.
2. [Distributed Energy Systems Integration Group](#) (2009); NREL Report No. FS-550-46439.

Journal Articles

1. *Distributed Intelligent Energy Management System for a single phase high frequency AC microgrid*, S. Chakraborty, M.D. Weiss and M.G. Simoes, IEEE Transaction on Industrial Electronics (IE), (vol. 54, no. 1, February 2007). *Selected by IEEE Smart Grid Initiative as one of the top 25 IEEE publications on renewable energy based on the number of views and the number of citations, as of November, 2009.* (<http://smartgrid.ieee.org/publications/top-ieee-xplore-publications/renewable-energy>)
2. *The Sun Also Rises – Planning for Large-Scale Solar Power*, J. Bebic, R. Walling, K. O'Brien, and B. Kroposki, IEEE Power and Energy Magazine, Vol. 7(3), May/June 2009. *Selected by IEEE Power and Energy Magazine for reprint in a special issue devoted to Smart Grid Applications.* (<http://www.ieee-pes.org/images/pdf/2010pe-SmartGrid-all.pdf>)
3. *Optimum Sizing and Placement of Distributed and Renewable Energy Sources in Electric Power Distribution Systems*, B. Kroposki, P.K. Sen, and K. Malmedal, accepted to IEEE Transactions on Industry Application, 2010
4. *Selection of Distribution Feeders for Implementing Distributed and Renewable Energy Applications*, B. Kroposki, P.K. Sen, K. Malmedal, accepted to IEEE Transactions on Industry Application, 2010
5. *Understanding Variability and uncertainty of Photovoltaics for Integration with the Electric Power System*, Mills, A., M. Ahlstrom, M. Brower, A. Ellis, R. George, T. Hoff, B. Kroposki, C. Lenox, N. Miller, J. Stein, Y. Wan, submitted to *The Electricity Journal*, December 2009
6. *An auto-tuning digital controller for DC-DC power converters*, M. Shirazi, R. Zane, and D. Maksimovic, IEEE Transactions on Power Electronics, Special Issue on Modeling and Advanced Control in Power Electronics, vol. 24, no. 11, pp. 2578 – 2588, Nov. 2009.
7. *Experimental evaluation of active filtering in a single-phase high frequency AC microgrid*, S. Chakraborty and M.G. Simoes, IEEE Transaction on Energy Conversion (EC), vol. 24, no. 3, September 2009
8. *Case Studies in Metro Photovoltaics: The Rub With Secondary Networks*, M. Coddington, B. Kroposki, T. Basso, Solar Industry Magazine, Volume 2, Number 7, August 2009
9. *Review of power electronics interfaces for distributed energy systems towards achieving low-cost modular design*, S. Chakraborty, W. Kramer and B. Kroposki, Elsevier Renewable and Sustainable Energy Reviews, vol. 13, no. 9, July 2009

10. *The Future's So Bright -- Looking Forward to Large-Scale Solar Integration*, Kroposki, B.; Margolis, R; Ton, D. (2009). IEEE Power and Energy Magazine. Vol. 7(3), May/June 2009; pp. 14-21
11. *Distributed Energy Resources and Renewable Energy in Distribution Systems: Protection Considerations and Penetration Levels*, K. Malmedal, PK. Sen, and B. Kroposki, IAS 4^{3rd} Annual Meeting, Edmonton, Alberta, Canada, October 2008. (Also accepted for IEEE Transactions on Industry Applications)
12. *Integration of frequency response measurement capabilities in digital controllers for DC-DC converters*, M. Shirazi, J. Morroni, A. Dolgov, R. Zane, and D. Maksimovic, IEEE Transactions on Power Electronics, vol. 23, no. 5, pp. 2524 – 2535, Sept. 2008.
13. *Renewable Hydrogen Production*, J. Turner, G. Sverdrup, M. Mann, P. Maness, B. Kroposki, M. Ghirardi, R. Evans, and D. Blake, Journal of International Energy Research, 2008
14. *Making Microgrids Work*, B. Kroposki, Robert Lasseter, T. Ise, S. Morozumi, F. Katiraei, S. Papathanassiou, and N. Hatziargyriou, IEEE Power and Energy Magazine, May 2008.
15. *Electronic ballast control IC with digital phase control and lamp current regulation*, Y. Yin, M. Shirazi, and R. Zane, IEEE Transactions on Power Electronics, vol. 23, no. 1, pp. 11 – 18, Jan. 2008.
16. *Benefits of Power Electronic Interfaces for Distributed Energy Applications*, B. Kroposki, C. Pink, R. DeBlasio, H. Thomas, M. Simoes, and PK. Sen, accepted to IEEE Transactions on Energy Conversion for publication in 2009.
17. *Renewable Hydrogen Production*, J. Turner, G. Sverdrup, M. Mann, P. Maness, B. Kroposki, M. Ghirardi, R. Evans, D. Blake, Journal of International Energy Research, 2007
18. *The Energy Policy Act of 2005 and its Impact on Distributed Generation*, K. Malmedal, B. Kroposki and P. K. Sen, IEEE Industry Applications Society Magazine, January/February 2007, pp. 14-20.
19. *Induction generators for small wind energy systems*, M.G. Simoes, S. Chakraborty and R. Wood, IEEE Power Electronics Society Newsletter, July 2006.
20. *Neural dynamic programming based online controller with a novel trim approach*, S. Chakraborty and M.G. Simoes, IEE Proceedings on Control Theory and Applications (CTA), vol. 152, no. 1, January 2005.
21. *Comment on 'Air Emissions Due to Wind and Solar Power'*, Mills, A.; Wiser, R.; Milligan, M.; O'Malley, M., Environmental Science and Technology. Vol. 43(15), 2009; pp. 6106-6107; NREL Report No. JA-550-46625.
22. *Up with Wind*, Corbus, D.; Lew, D.; Jordan, G.; Winters, W.; Van Hull, F.; Manobianco, J.; Zavadil, B. IEEE Power and Energy Magazine. Vol. 7(6), November/December 2009; pp. 36-46; NREL Report No. JA-550-47362.
23. *Wind Power Myths Debunked*. Milligan, M.; Porter K.; DeMeo, E.; Denholm, P.; Holttinen, H.; Kirby, B.; Miller, N.; Mills, A.; O'Malley, M.; Schuerger, M.; Soder, L. IEEE Power and Energy Magazine. Vol. 7(6), November/December 2009; pp. 89-99; NREL Report No. JA-550-47230.
24. *Creating the Dataset for the Western Wind and Solar Integration Study (U.S.A.)*. Potter, C. W.; Lew, D.; McCaa, J.; Cheng, S.; Eichelberger, S.; Gritmit, E. Wind Engineering. Vol. 32(4), 2008; pp. 325-338; NREL Report No. JA-550-46153.
25. *A Whirl of Activity*. Piwko, R.; Camm, E.; Ellis, A.; Muljadi, E.; Zavadil, R.; Walling, R.; O'Malley, M.; Irwin, G.; Saylor, S. IEEE Power and Energy Magazine. Vol. 7(6), November/December 2009; pp. 26-35; NREL Report No. JA-550-47229.
26. *The Impact of Balancing Area Size and Ramping Requirements on Wind Integration*. M. Milligan, B. Kirby, Wind Engineering, Vol 32, #4, 2008. pp 379-398.

27. *Effect of Variable Speed Wind Turbine Generator on the Stability of a Weak Grid*, Muljadi, E.; Butterfield, C. P.; Parsons, B.; Ellis, A. IEEE Transactions on Energy Conversion. Vol. 22(1), March 2007; pp. 29-36; NREL Report No. JA-500-40175.

Conference Papers

1. *Visualization and Classification of Power System Frequency Data Streams*, Bank, J.N.; Omitaomu, O.A.; Fernandez, S.J.; Yilu Liu; , Data Mining Workshops, 2009. ICDMW '09. IEEE International Conference on , vol., no., pp.650-655, 6-6 Dec. 2009
2. *Wind to Hydrogen Demonstration Project: Results and Lessons Learned*, Harrison, K.W.; Martin, G.D. American Institute of Chemical Engineers Conference, November 2009
3. *Optimum Sizing and Placement of Distributed and Renewable Energy Sources in Electric Power Distribution Systems*, B. Kroposki, PK. Sen, and K. Malmedal, IEEE Industrial Applications Society Meeting, October 2009, Houston, TX
4. *Online Data Mining Framework for the Electric Power Grid*, Bank, J.N.; Omitaomu, O.A.; Fernandez, S. J.;, NASA CIDU/AISRP Conference, Oct 14-16 2009.
5. *Impacts of Plug-in Vehicles and Distributed Storage on Electric Power Delivery Networks*, P. Evans, S. Kuloor, and B. Kroposki, IEEE Vehicle Power and Propulsion Conference, September 2009, Dearborn, MI
6. *Evaluation of VAR control and voltage regulation functionalities in a single-phase utility-connected inverter for distributed energy applications*, S. Chakraborty, B. Kroposki and W. Kramer, IEEE Energy Conversion Congress and Exposition (ECCE), September 2009
7. *Electricity, Resources, and Building Systems Integration at the National Renewable Energy Laboratory*, D. Mooney and B. Kroposki, IEEE Power Engineering Society General Meeting, July 2009, Calgary, Canada
8. *An Integration Facility to Accelerate Deployment of Distributed Energy Resources in Microgrids* , B. Kroposki, IEEE Power Engineering Society General Meeting, July 2009, Calgary, Canada
9. *Photovoltaic Systems interconnected onto Secondary Network Distribution Systems*, M. Coddington, B. Kroposki, T. Basso, K. Lynn, and M. Vaziri, IEEE Photovoltaic Specialist Conference, June 2009, Philadelphia, PA
10. *Selection of Distribution Feeders for Implementing Distributed and Renewable Energy Applications*, B. Kroposki, PK Sen, K. Malmedal, 2009 IEEE Rural electric Power Conference, Ft. Collins, CO, April 2009.
11. *A review of plug-in vehicles and vehicle-to-grid capability*, B. Kramer, S. Chakraborty and B. Kroposki, IEEE Industrial Electronics Society Conference (IECON), November 2008
12. *Distribution System Voltage Performance Analysis for High-Penetration PV*, E. Liu, J. Bebic, B. Kroposki, J. de Bedout, W. Ren, IEEE 2030 Conference, Atlanta, GA, November 2008
13. *PV-microgrid operational cost minimization by neural forecasting and heuristic optimization*, S. Chakraborty and M.G. Simoes, IEEE Industry Applications Conference (IAS), October 2008
14. *Renewable Systems Interconnection – Distributed Photovoltaic Study* D. Ton, B. Kroposki, R. Margolis, G. Kuswa, J. Torres, and T. Key, 23rd European PV Conference Valencia, Spain, September 2008
15. *Advancement of Energy Storage Devices and Applications in Electrical Power System*, S. Smith, PK. Sen, and B. Kroposki, IEEE Power Engineering Society General Meeting, July 2008, Pittsburg, PA.

16. *Microgrid Standards and Technologies*, B. Kroposki, IEEE Power Engineering Society General Meeting, July 2008, Pittsburg, PA.
17. *Model-based DG control as an economic solution to load growth*, J. Hambrick, M. Dilek, L. Yishan, R. Seguin, H. Asgeirsson, and R. Broadwater, IEEE Power and Energy Society General Meeting, July 2008, Pittsburg, PA.
18. *Development of Microgrid Technologies and Standards in the U.S.*, B. Kroposki, PV Mini-Grid and Hybrid Power System Conference, Athens Greece, June 2008
19. *Stability of CIS/CIGS Modules at the Outdoor Test Facility Over the Years*, J.A. del Cueto, S. Rummel, B. Kroposki, C. Osterwald, and A. Anderberg, IEEE PV Specialist Conference, San Diego, CA, May 2008
20. *Renewable Systems Interconnection – Distributed Photovoltaic Study* D. Ton, B. Kroposki, R. Margolis, G. Kuswa, J. Torres, and T. Key, 17th PVSEC, Japan, December 2007
21. *Microgrid Standards and Technology Development*, B. Kroposki, C. Pink, T. Basso, and R. DeBlasio, 2007 IEEE Power Engineering Society General Meeting, Tampa, Florida, June 2007
22. *Energy Policy Act of 2005 and Its Impact on Renewable Energy Applications in USA*, K. Malmedal, B. Kroposki, and P. Sen, 2007 IEEE Power Engineering Society General Meeting, Tampa, Florida, June 2007
23. *Advancements in Distributed Generation Issues: Interconnection, Modeling, and Tariffs*, H. Thomas, B. Kroposki, T. Basso, B. Treanton, 2007 IEEE Power Engineering Society General Meeting, Tampa, Florida, June 2007
24. *Visualization of Wide-Area Frequency Measurement Information*, Bank, J.N.; Gardner, R.M.; Tsai, S.-J.S.; Kyung Soo Kook; Yilu Liu; , Power Engineering Society General Meeting, 2007. IEEE , vol., no., pp.1-8, 24-28 June 2007
25. *Development of a High-Speed Static Switch for Distributed Energy and Microgrid Applications*, B. Kroposki, C. Pink, J. Lynch, V. John, S. Danial, E. Benedict, and I. Vihinen, 4th Power Conversion Conference, Nagoya, Japan, April 2007
26. *Autotuning techniques for digitally-controlled point-of-load converters with wide range of capacitive loads*, M. Shirazi, R. Zane, D. Maksimovic, L. Corradini, and P. Mattavelli, Proc. Applied Power Electronics Conference, 2007, pp. 14-20.
27. *Minimum phase response in digitally controlled boost and flyback converters*, V. Yousefzadeh, M. Shirazi, D. Maksimovic, Proc. Applied Power Electronics Conference, 2007, pp. 112-118.
28. *Online health monitoring in digitally controlled power converters*, J. Morroni, A. Dolgov, M. Shirazi, R. Zane, and D. Maksimovic, Proc. IEEE Power Electronics Specialists Conference, 2007, pp. 112-118.
29. *Cost considerations on fuel cell renewable energy systems*, M.G. Simoes, S. Chakraborty, C.S. Uriarte and F.A. Farret, IEEE Industry Applications Conference (IAS), October 2006
30. *Generator Trip Identification Using Wide-Area Measurements and Historical Data Analysis*, Bank, J.N.; Gardner, R.M.; Wang, J.K.; Arana, A.J.; Yilu Liu; Power Systems Conference and Exposition, 2006. PSCE '06. 2006 IEEE PES , vol., no., pp.1677-1681, Oct. 29 2006-Nov. 1 2006
31. *Non-Parametric Power System Event Location Using Wide-Area Measurements*, Gardner, R.M.; Bank, J.N.; Wang, J.K.; Arana, A.J.; Yilu Liu; , Power Systems Conference and Exposition, 2006. PSCE '06. 2006 IEEE PES , vol., no., pp.1668-1675, Oct. 29 2006-Nov. 1 2006
32. *Estimating Speed of Frequency Disturbance Propagation Through Transmission and Distribution Systems*, Arana, A.J.; Bank, J.N.; Gardner, R.M.; Yilu Liu; , Power Systems Conference and Exposition, 2006. PSCE '06. 2006 IEEE PES , vol., no., pp.1286-1290, Oct. 29 2006-Nov. 1 2006

33. *Electrolysis: Opportunities for Electric Power Utilities in a Hydrogen Economy*, B. Kroposki, J. Levene, K. Harrison, PK. Sen, and F. Novachek, , North American Power Symposium, Carbondale, Ill., September 2006, pp. 697-706.
34. *Comparison of Degradation Rates of Individual Modules Held at Maximum Power* C.R. Osterwald, J. Adelstein, J.A. del Cueto, B. Kroposki, D. Trudell, and T. Moriarty, 4th WCPEC, Hawaii, July 2006
35. *Benefits of Power Electronic Interfaces for Distributed Energy Applications*, B. Kroposki, C. Pink, R. DeBlasio, H. Thomas, M. Simoes, and PK. Sen, 2006 IEEE PES General Meeting, Montreal, June 2006
36. *Characterizing Electrolyzer Performance for Use in Wind Energy Applications* ,K. Harrison, B. Kroposki, and C. Pink, 2006 AWAE Conference, Pittsburg, June 2006
37. *The Energy Policy Act of 2005 and its Impact on Distributed Generation* K. Malmedal, PK. Sen, and B. Kroposki, 2006 IEEE Rural Electric Power Conference, Albuquerque, April 2006
38. *Wind Energy and Production of Hydrogen and Electricity – Opportunities for Renewable Hydrogen* ,J. Levene, B. Kroposki, and G. Sverdrup, 2006 Power Gen Conference, Las Vegas, June 2006
39. *Fully integrated ballast control with digital phase control*, Y. Yin, M. Shirazi, R. Zane, Proc. Applied Power Electronics Conference, 2005, pp. 1065-1071.
40. *Fuzzy ARTMAP based forecast of renewable generation for a high frequency AC microgrid*, S. Chakraborty and M.G. Simoes, IEEE Industrial Electronics Society Conference (IECON), November 2005.
41. *Advanced active filtering in a single phase high frequency AC microgrid*, S. Chakraborty and M.G. Simoes, IEEE Power Electronics Specialist Conference (PESC), June 2005.
42. *The Impact of Electric Industry Structure on High Wind Penetration Potential*. M. Milligan, B. Kirby, M. Goggin, R. Gramlich, Presented at WindPower 2009, Chicago, IL.
43. *Capacity Requirements to Support Inter-Balancing Area Wind Delivery*. Brendan Kirby, Michael Milligan, Presented at WindPower 2009, Chicago, IL.
44. [\(2009\). Eastern Wind Integration and Transmission Study -- Preliminary Findings: Preprint.](#) Corbus, D.; Milligan, M.; Ela, E.; Schuerger, M.; Zavadil, B., NREL Report No. CP-550-46505.
45. [\(2009\). Evolution of Wind Power Integration Studies: Past, Present, and Future.](#) [Proceedings] Ela, E.; Milligan, M.; Parsons, B.; Lew, D.; Corbus, D., 2009 IEEE Power and Energy Society General Meeting (PES 09);26-30 July 2009; Calgary, Alberta, Canada. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 8 pp.; NREL Report No. CP-550-47059.
46. [\(2009\). Analysis of Mesoscale Model Data for Wind Integration \(Poster\).](#) Schwartz, M.; Elliott, D.; Lew, D.; Corbus, D.; Scott, G.; Haymes, S.; Wan, Y. H.; NREL Report No. PO-500-45203.
47. [\(2009\). How do Wind and Solar Power Affect Grid Operations: The Western Wind and Solar Integration Study; Preprint.](#) Lew, D.; Milligan, M.; Jordan, G.; Freeman, L.; Miller, N.; Clark, K.; Piwko, R., 10 pp.; NREL Report No. CP-550-46517.
48. [\(2009\). Large-Scale Wind Integration Studies in the United States: Preliminary Results; Preprint.](#) Milligan, M.; Lew, D.; Corbus, D.; Piwko, R.; Miller, N.; Clark, K.; Jordan, G.; Freeman, L.; Zavadil, B.; Schuerger, M.; NREL Report No. CP-550-46527.
49. [\(2010\). Short Circuit Current Contribution for Different Wind Turbine Generator Types: Preprint.](#) Muljadi, E.; Gevorgian, V.; Samaan, N.; Li, J.; Pasupulati, S.; NREL Report No. CP-550-47193.

50. [\(2008\). Renewable Energy Simulation](#), Muljadi, E.; Bialasiewicz, J. T. Proceedings of IECON 2008: 34th Annual Conference of the IEEE Industrial Electronics Society, 10-13 November 2008, Orlando, Florida. Piscataway, NJ: Institute of Electrical and Electronics Engineers, Inc. (IEEE) pp. 19-22; NREL Report No. CP-550-45360.
51. [\(2008\). Offsite Observation Input for Forecasting in the U.S.: To Use or Not to Use.](#) [Proceedings]; Ela, E., 3rd Joint Action Symposium on Forecasting: Optimal Use of Available Information in Wind Power Forecasting. Stockholm, Sweden: Vattenfall pp. 125-133; NREL Report No. PR-550-46107.
52. [\(2009\). Capacity Requirements to Support Inter-Balancing Area Wind Delivery](#), Kirby, B.; Milligan, M. Windpower 2009 Conference & Exhibition [Full Conference Materials DVD-ROM], 4-7 May 2009, Chicago, Illinois. Washington, D.C.: American Wind Energy Association (AWEA); produced by Fleetwood Onsite Conference Recording 22 pp.; NREL Report No. CP-550-46842.
53. [\(2009\). Dynamic Performance and Effect of Hybrid Renewable Power System with Diesel/Wind/PV/Battery](#), Pan, W.; Gao, W.; Muljadi, E. Proceedings of the 1st International Conference on Sustainable Power Generation And Supply (SUPERGEN), 6-7 April 2009, Nanjing, China. Beijing, China: Power Network Technology Press pp. 1-5; NREL Report No. CP-550-44954.
54. [\(2009\). Validation and Analysis of Wind Power Plant Models Using Short-Circuit Field Measurement Data.](#) [Proceedings]; Singh, M.; Faria, K.; Santoso, S.; Muljadi, E. 2009 IEEE Power and Energy Society General Meeting (PES 09); 26-30 July 2009; Calgary, Alberta, Canada. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 6 pp.; NREL Report No. CP-550-47062.
55. [\(2009\). New Control Strategy for Stand-Alone Fuel Cell-Battery Hybrid Power Supply System.](#) [Proceedings]; Zheglov, V.; Wenzhong G.; Muljadi, E.; Ge, W. 2009 IEEE Power and Energy Society General Meeting (PES 09); 26-30 July 2009; Calgary, Alberta, Canada. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 6 pp.; NREL Report No. CP-550-47063.
56. Burnham, D. J.; Santoso, S.; Muljadi, E. [\(2009\). Variable Rotor-Resistance Control of Wind Turbine Generators.](#) [Proceedings] 2009 IEEE Power and Energy Society General Meeting (PES 09); 26-30 July 2009; Calgary, Alberta, Canada. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 6 pp.; NREL Report No. CP-550-47058.
57. [\(2008\). Impact of Wind Power Plants on Voltage and Transient Stability of Power Systems.](#) [Proceedings]; Muljadi, E.; Nguyen, T. B.; Pai, M. A. 2008 IEEE Energy 2030 Conference, 17-18 November 2008, Atlanta, Georgia. Piscataway, NJ: Institute of Electrical and Electronics Engineers, Inc. (IEEE) 7 pp.; NREL Report No. CP-550-44262.
58. [\(2008\). Method of Equivalencing for a Large Wind Power Plant with Multiple Turbine Representation.](#) Muljadi, E.; Pasupulati, S.; Ellis, A.; Kostrov, D.; Proceedings of the IEEE Power & Energy Society General Meeting, 20-24 July 2008, Pittsburgh, Pennsylvania. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 9 pp.; NREL Report No. CP-500-44221.
59. [Sub-hourly Analysis of Ramping Requirements of Wind: Impact of Balancing Area Consolidated Operations](#), M. Milligan, B. Kirby; Presented at WindPower 2008.
60. [Do Wind Forecasts Make Good Generation Schedules?](#) ; K. Dagoon, M. Milligan, B. Kirby, Presented at WindPower 2008.
61. *Wind Capacity Value*; M. Milligan, K. Porter, WindPower 2008.
62. [Facilitating Wind Development: The Importance of Market Structure](#), B. Kirby, M. Milligan, M. Goggin, R. Gramlich; May 2008.

63. [Renewable Energy Simulation](#); Proceedings of IECON 2008: Muljadi, E.; Bialasiewicz, J. T. 34th Annual Conference of the IEEE Industrial Electronics Society, 10-13 November 2008, Orlando, Florida. Piscataway, NJ: Institute of Electrical and Electronics Engineers, Inc. (IEEE) pp. 19-22; NREL Report No. CP-550-45360.
64. [Fault Analysis at a Wind Power Plant for One Year of Observation.](#); Muljadi, E.; Mills, Z.; Foster, R.; Conto, J.; Ellis, A. Proceedings of the IEEE Power & Energy Society General Meeting, 20-24 July 2008, Pittsburgh, Pennsylvania. Conversion and Delivery of Electrical Energy in the 21st Century. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 7 pp.; NREL Report No. CP-500-44218.
65. *The Impact of Balancing Area Size, Obligation Sharing, and Energy Markets on Mitigating Ramping Requirements in Systems with Wind Energy*; M. Milligan and B. Kirby: Wind Engineering Journal. Vol 32(4).
66. *The Impact of Balancing Area Size and Ramping Requirements on Wind Integration*, M. Milligan and B. Kirby; Wind Engineering, Vol 32, #4, 2008. Pp 399-414.
67. *Capacity and Ramping Considerations for Wind*; *Electricity Journal*; B. Kirby and M. Milligan,
68. *Fault Analysis at a Wind Power Plant for One Year of Observation: Preprint*; Muljadi, E.; Mills, Z.; Foster, R.; Conto, J.; Ellis, A.; NREL Report No. CP-500-42885.
69. *Current Methods to Calculate Capacity Credit of Wind Power, IEA Collaboration*, Cornel Ensslin, Michael Milligan, Hannele Holttinen, Mark O'Malley, and Andrew Keane, IEEE Power Engineering Society Summer Meeting, 2008.
70. *Capacity Value of Wind in the US, An Update*, M. Milligan and K. Porter: Presented at the IEEE Power Engineering Society Summer Meeting, 2008
71. [Validation of Wind Power Plant Models.](#) Muljadi, E.; Ellis, A. Proceedings of the IEEE Power & Energy Society General Meeting, 20-24 July 2008, Pittsburgh, Pennsylvania. Conversion and Delivery of Electrical Energy in the 21st Century. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 6 pp.; NREL Report No. CP-500-44215.
72. [Method of Equivalencing for a Large Wind Power Plant with Multiple Turbine Representation: Preprint.](#) Muljadi, E.; Pasupulati, S.; Ellis, A.; Kosterov, D., NREL Report No. CP-500-42886.
73. [\(2008\). Validation of Wind Power Plant Dynamic Models: Preprint](#), Muljadi, E.; Ellis, A., NREL Report No. CP-500-43667.
74. [Characteristics of Variable Speed Wind Turbines Under Normal and Fault Conditions](#), Muljadi, E.; Butterfield, C. P.; Parsons, B.; Ellis, A.; Proceedings of the IEEE Power & Energy Society General Meeting, 24-28 June 2007, Tampa, Florida. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 7 pp.; NREL Report No. CP-500-44223.
75. [Characteristics of Wind Turbines Under Normal and Fault Conditions: Preprint](#); Muljadi, E.; Butterfield, C. P.; Parsons, B.; Ellis, A; NREL Report No. CP-500-41051.
76. *Best Practices in Grid Integration of Variable Wind Power: Summary of Recent US Case Study Results and Mitigation Measures*, J. Charles Smith, Brian Parsons, Thomas Acker, Michael Milligan, Robert Zavadil, Matthew Schuerger, Edgar DeMeo, Presented at the European Wind Energy Conference, Milan, Italy, May 7-10, 2007.
77. [AC/DC/AC Converter Modulation Strategy with Natural Zero Sequence Rejection Using Only One Six-Switch Inverter Module.](#) Velpuri, A. N.; Hess, H. L.; Law, J. D.;

Cegnar, E. J.; Muljadi, E. Proceedings of the IEEE International Electric Machines and Drives Conference (IEMDC '07), 3-5 May 2007. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) pp. 1226-1233; NREL Report No. CP-500-44209.

78. [Queuing Up: Interconnecting Wind Generation into the Power System](#). Zavadil, R.; Miller, N.; Ellis, A.; Muljadi, E.; Camm, E.; Kirby, B IEEE Power and Energy Magazine. Vol. 5(6), November/December 2007; pp. 47-58; NREL Report No. JA-500-42611.
79. . *Wind Plant Integration: Advances in Insights and Methods*. Edgar A. DeMeo, Renewable Energy Consulting; Gary A. Jordan, GE Energy; Clint Kalich, Avista; Jack King, EnerNex; Michael R. Milligan, NREL; Clifford Murley, Sacramento Municipal Utilities District; Brett Oakleaf, Xcel Energy; Matthew J. Schuerger, Energy Systems Consulting Services, LLC; IEEE Power and Energy. Dec 2007.
80. [Impact of Energy Imbalance Tariff on Wind Energy](#). Wan, Y; Milligan, M; Kirby, B. Presented at WindPower 2007, Los Angeles, CA.
81. [Impact of Balancing Areas Size, Obligation Sharing, and Ramping Capability on Wind Integration](#): Milligan, M.; Kirby, B. (2007). NREL Report No. CP-500-41809. Presented at WindPower 2007, Los Angeles, CA.
82. *Utility Wind Integration State of the Art*. Milligan, M., Coauthors Charlie Smith, UWIG; Ed DeMeo, Renewable Energy Consulting Services; Brian Parsons, National Renewable Energy Laboratory. IEEE Transactions on Power Systems. Aug, 2007.
83. [Power Quality of Renewable Energy Systems Can Be Evaluated Using Simulation Data](#). Bialasiewicz, J. T.; Muljadi, E. Proceedings of the IEEE International Symposium on Industrial Electronics (ISIE 2007), 4-7 June 2007, Caixanova - Vigo, Spain. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) pp. 2505-2509; NREL Report No. CP-500-44210.
84. [\(2007\). Development and Validation of WECC Variable Speed Wind Turbine Dynamic Models for Grid Integration Studies](#). Behnke, M.; Ellis, A.; Kazachkov, Y.; McCoy, T.; Muljadi, E.; Price, W.; Sanchez-Gasca, J.; NREL Report No. CP-500-40851.
85. [\(2006\). Comparing Single and Multiple Turbine Representations in a Wind Farm Simulation: Preprint](#). Muljadi, E.; Parsons, B.; NREL Report No. CP-500-39510.
86. [California Renewable Portfolio Integration Standard Integration Cost Final Report](#). Milligan, M. Coauthors Henry Shiu, California Wind Energy Collaborative; Brendan Kirby, Oak Ridge National Laboratory; Kevin Jackson, Dynamic Design Engineering. California Energy Commission, 2006.
87. [Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States](#). Milligan, M.; coauthors Brian Parsons, National Renewable Energy Laboratory; J. Charles Smith, Utility Wind Integration Group; Edgar DeMeo, Systems Consulting Services, LLC; Brett Oakleaf, Xcel Energy; Kenneth Wolf, Minnesota Public Utilities Commission; Matthew J. Schuerger, Energy Systems Consulting Services, LLC; Robert Zavadil, EnerNex Corp.; Mark Ahlstrom, WindLogics; Dora Yen Nakafuji, California Energy Commission. Presented at the European Wind Energy Conference, Athens, Greece. March 2006.
88. *The Capacity Value of Wind in the United States*, with Kevin Porter, Exeter Associates. *Electricity Journal*, Milligan, M., Vol. 19, Issue 2, March 2006. pp 91-99. Elsevier, Inc.

89. [Equivalencing the Collector System of a Large Wind Power Plant: Preprint](#). Muljadi, E.; Butterfield, C. P.; Ellis, A.; Mechenbier, J.; Hochheimer, J.; Young, R.; Miller, N.; Delmerico, R.; Zavadil, R.; Smith, J. C.; NREL Report No. CP-500-38940.
90. [Equivalencing the Collector System of a Large Wind Power Plant](#). Muljadi, E.; Butterfield, C. P.; Ellis, A.; Mechenbier, J.; Hocheimer, J.; Young, R.; Miller, N.; Delmerico, R.; Zavadil, R.; Smith, J. C. IEEE 2006 Power Engineering Society General Meeting, 18-22 June 2006, Montreal, Quebec, Canada. Piscataway, NJ: Institute of Electrical and Electronics Engineers, Inc. (IEEE) 6 pp.; NREL Report No. CP-500-41177.
91. [\(2006\). Wind Farm Aggregation Impact on Power Quality: Preprint](#). Bialasiewicz, J. T.; Muljadi, E.; NREL Report No. CP-500-39870.
92. *Integration of Utility-Scale Wind Plants: Costs, Status and Issues*. Milligan, M., coauthors Ed DeMeo, Renewable Energy Consulting Services; William Grant, Xcel Energy; Matthew J. Schuerger, Energy Systems Consulting Services, LLC. *Power and Energy Magazine*. IEEE. Nov/Dec, 2005.
93. [Wind Task Force Report to the Clean and Diverse Energy Advisory Committee](#). Milligan, M. Western Interstate Energy Board, Western Governors Association. 2006. Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States. Parsons, B.; Milligan, M.; Smith, J. C.; DeMeo, E.; Oakleaf, B.; Wolf, K.; Schuerger, M.; Zavadil, R.; Ahlstrom, M.; Nakafuji, D. Y. (2006). Presented at the Nordic Wind Power Conference, Espoo, Finland, May 2006 (updated version of [62]).
94. [A Multi-year Analysis of Renewable Energy Impacts in California: Results from the Renewable Portfolio Standards Integration Cost Analysis](#). Milligan, M. Coauthors Henry Shiu, California Wind Energy Collaborative; Brendan Kirby, Oak Ridge National Laboratory; Kevin Jackson, Dynamic Design Engineering. Presented at Windpower 2006, Pittsburg, PA, June 2006.
95. [Properties for Cost-causation-based Tariffs for Wind Ancillary Service Impacts](#). Milligan, M. Coauthor Brendan Kirby, Oak Ridge National Laboratory. Presented at Windpower 2006, Pittsburg, PA, June 2006.
96. [JEDI II: A Multi-State Analysis of the Economic Development Impacts of Wind, Gas, and Coal Power - Utilizing the New Jobs and Economic Development Impacts Model](#). Milligan, M. Coauthors Suzanne Tegen, National Renewable Energy Laboratory; Marshall Goldberg, MRG Associates. Presented at Windpower 2006, Pittsburg, PA, June 2006.
97. [Wind Supply Curves and Location Scenarios in the West: Summary of the Clean and Diverse Energy Wind Task Force Report](#). Milligan, M. Coauthors Brian Parsons, National Renewable Energy Laboratory; Rachel Shimshak, Renewable Northwest Project; Doug Larson and Thomas Carr, Western Interstate Energy Board (all authors were members of the Western Governors' Association Clean and Diverse Energy Wind Task Force). Presented at Windpower 2006, Pittsburg, PA, June 2006.
98. [Model Validation at the 204-MW New Mexico Wind Energy Center \(Poster\)](#). Muljadi, E.; Butterfield, C. P.; Miller, N.; Delmerico, R.; Ellis, A.; Mechenbier, J.; Zavadil, R.; Smith, J. C.; Hochheimer, J.; Young, R. (Proceedings of) Windpower 2006 Conference and Exhibition (CD-ROM, Business Track), 4-7 June 2006, Pittsburgh, Pennsylvania. Washington, DC: American Wind Energy Association 1 pg.; NREL Report No. CP-500-41216.
99. [Power Quality Aspects in a Wind Power Plant: Preprint](#). Muljadi, E.; Butterfield, C. P.; Chacon, J.; Romanowitz, H. NREL Report No. CP-500-39183.

100. [Analysis of Renewable-Energy Systems Using RPM-Sim Simulator](#). Bialasiewicz, J. T.; Muljadi, E. IEE Transactions on Industrial Electronics. Vol. 53(4), August 2006; pp. 1137-1143; NREL Report No. JA-500-37875.
101. [\(2006\). Model Validation at the 204 MW New Mexico Wind Energy Center](#). Muljadi, E.; Butterfield, C. P.; Miller, N.; Delmerico, R.; Ellis, A.; Mechenbier, J.; Zavadil, R.; Smith, J. C.; Hochheimer, J.; Young, R. (Proceedings of) Windpower 2006 Conference and Exhibition (CD-ROM, Business Track), 4-7 June 2006, Pittsburgh, Pennsylvania. Washington, DC: American Wind Energy Association 11 pp.; NREL Report No. CP-500-41215.
102. [\(2006\). Model Validation at the 204 MW New Mexico Wind Energy Center: Preprint](#). Muljadi, E.; Butterfield, C. P.; Ellis, A.; Mechenbier, J.; Hochheimer, J.; Young, R.; Miller, N.; Delmerico, R.; Zavadil, R.; Smith, J. C. 14 pp.; NREL Report No. CP-500-39048.
103. [\(2006\). Power Quality Aspects in a Wind Power Plant](#). Muljadi, E.; Butterfield, C. P.; Chacon, J.; Romanowitz, H. IEEE 2006 Power Engineering Society General Meeting, 18-22 June 2006, Montreal, Quebec, Canada. Piscataway, NJ: Institute of Electrical and Electronics Engineers, Inc. (IEEE) 8 pp.; NREL Report No. CP-500-41176.
104. [\(2006\). Model Validation at the 204-MW New Mexico Wind Energy Center](#). Muljadi, E.; Butterfield, C. P.; Ellis, A.; Mechenbier, J.; Hochheimer, J.; Young, R.; Miller, N.; Delmerico, R.; Zavadil, R.; Smith, J. C. 1 p.; NREL Report No. PO-500-39771.
105. [\(2005\). Self Excitation and Harmonics in Wind Power Generation. AAIA-2005-0396](#). Muljadi, E.; Butterfield, C. P.; Romanowitz, H.; Yinger, R. Collection of the 2005 ASME Wind Energy Symposium Technical Papers at the 43rd AIAA Aerospace Sciences Meeting and Exhibit, 10-13 January 2005, Reno, Nevada. New York: American Institute of Aeronautics and Astronautics, Inc. (AIAA) and American Society of Mechanical Engineers (ASME) pp. 101-110; NREL Report No. CP-500-38455.
106. [\(2005\). ERCOT's Dynamic Model of Wind Turbine Generators \(Presentation\)](#). Muljadi, E.; Butterfield, C. P.; Conto, J.; Donohoo, K. Windpower 2005 (Windpower 05) Conference and Exhibition (CD-ROM), 15-18 May 2005, Denver, Colorado. Washington, DC: American Wind Energy Association; Content Management Corp. 8 pp.; NREL Report No. PR-500-38134.
107. [\(2005\). ERCOT's Dynamic Model of Wind Turbine Generators](#). Muljadi, E.; Butterfield, C. P.; Conto, J.; Donoho, K. Windpower 2005 (Windpower 05) Conference and Exhibition (CD-ROM), 15-18 May 2005, Denver, Colorado. Washington, DC: American Wind Energy Association; Content Management Corp. 9 pp.; NREL Report No. CP-500-40199.
108. [\(2005\). ERCOT's Dynamic Model of Wind Turbine Generators: Preprint](#). Muljadi, E.; Butterfield, C. P.; Conto, J.; Donoho, K. 12 pp.; NREL Report No. CP-500-38126.
109. [\(2005\). Reduced Order Dynamic Model for Variable-Speed Wind Turbine with Synchronous Generator and Full Power Conversion Topology](#). Behnke, M. R.; Muljadi, E. Proceedings of the 2005 International Conference on Future Power Systems, 16-18 November 2005, Amsterdam, The Netherlands. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) 6 pp.; NREL Report No. CP-500-39065.
110. [A Method and Case Study for Estimating The Ramping Capability of a Control Area or Balancing Authority and Implications for Moderate or High Wind Penetration](#). Coauthor Brendan Kirby, Oak Ridge National Laboratory. Presented at Windpower 2005, Denver, CO. May 2005.
111. [The Impact of Wind Energy on Hourly Load Following Requirements: An Hourly and Seasonal Analysis](#).

112. Milligan, M., Coauthor Abigail Krich, Northern Power Systems and Cornell University. Presented at Windpower 2005, Denver, CO. May 2005.
113. [\(2005\). Self-Excitation and Harmonics in Wind Power Generation.](#) Muljadi, E.; Butterfield, C. P.; Romanowitz, H.; Yinger, R. Journal of Solar Energy Engineering: Transactions of the American Society of Mechanical Engineers. Vol. 127, November 2005; pp. 581-587; NREL Report No. JA-500-38169.
114. [\(2005\). Ride-Through Capability Predictions for Wind Power Plants in the ERCOT Network: Preprint.](#) Muljadi, E.; Butterfield, C. P.; Conto, J.; Donohoo, K. 11 pp.; NREL Report No. CP-500-37355.
115. [\(2005\). Ride-Through Capability Predictions for Wind Power Plants in the ERCOT Network.](#) Muljadi, E.; Butterfield, C. P.; Conto, J.; Donohoo, K. 2005 IEEE Power Engineering Society General Meeting, 12-16 June 2005, San Francisco, California. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) Vol. 1: pp. 72-79; NREL Report No. CP-500-39372.
116. [Determining The Capacity Value Of Wind: A Survey Of Methods And Implementation](#) Milligan, M.,. Coauthor Kevin Porter, Exeter Associates. Presented at Windpower 2005, Denver, CO. May 2005.
117. *A Preliminary Analysis and Case Study of Transmission Constraints and Wind Energy in the West.* Coauthor Damian Berger, Peak Power Engineering. Presented at Windpower 2005, Denver, CO. May 2005.
118. [California Renewables Portfolio Standard Renewable Generation Integration Cost Analysis.](#)
119. Milligan, M., *Phase III: Recommendations for Implementation.* Coauthors Brendan Kirby, Oak Ridge National Laboratory; Yuri Makarov and David Hawkins, California Independent System Operator; Kevin Jackson; Dynamic Design Engineering; and Henry Shiu, California Wind Energy Collaborative.
120. Milligan, M., *A Summary of Wind Power Impacts On Electric Power System Operating Costs.* Coauthors J. Charles Smith, NexGen, Edgar DeMeo, Renewable Energy Consulting Services, Brian Parsons, National Renewable Energy Laboratory. *International Journal of Energy Technology and Policy*, Vol 3, No. 4. 2005.

Book Chapters

1. *Interconnection of Alternative Energy Sources with the Grid* B. Kroposki, T. Basso, R. DeBlasio, N.R. Friedman Invited Chapter in *Integration of Alternative Sources of Energy* by F. Farret and M. Simoes, Wiley & Sons, 2006
2. *Renewable Energy and the Hydrogen Economy.* Rajeshwar, K.; McConnell, R.; Harrison, K.; Licht, S. (2008). Chapter 1 in *Solar Hydrogen Generation: Toward a*
3. *Electrolysis of Water.* Harrison, K.; Levene, J. I. (2008). Chapter 3 in *Solar Hydrogen Generation: Toward a Renewable Energy Future.* New York, NY: Springer

Subcontractor Reports

1. [Eastern Wind Integration and Transmission Study \(EWITS\). \(2010\).](#) 242 pp.; NREL Report No. SR-550-47078.
2. [Eastern Wind Integration and Transmission Study: Executive Summary and Project Overview \(Revised\). \(2010\).](#) 48 pp.; NREL Report No. SR-550-47086.

3. Brower, M. [\(2009\). Development of Eastern Regional Wind Resource and Wind Plant Output Datasets: March 3, 2008 -- March 31, 2010.](#) 66 pp.; NREL Report No. SR-550-46764.
4. [Nebraska Statewide Wind Integration Study: April 2008 - January 2010. \(2010\).](#) 439 pp.; NREL Report No. SR-550-47519.
5. [Nebraska Statewide Wind Integration Study: Executive Summary. \(2010\).](#) 41 pp.; NREL Report No. SR-550-47285.
6. [Development of Regional Wind Resource and Wind Plant Output Datasets: Final Subcontract Report, 15 October 2007 - 15 March 2009. \(2010\).](#) 29 pp.; NREL Report No. SR-550-47676.
7. [\(2009\). Wind Energy Curtailment Case Studies: May 2008 - May 2009.](#) Fink, S.; Mudd, C.; Porter, K.; Morgenstern, B. 54 pp.; NREL Report No. SR-550-46716.
8. [\(2009\). Central Wind Power Forecasting Programs in North America by Regional Transmission Organizations and Electric Utilities.](#) Porter, K.; Rogers, J. 24 pp.; NREL Report No. SR-550-46763.
9. [\(2009\). Generation Interconnection Policies and Wind Power: A Discussion of Issues, Problems, and Potential Solutions.](#) Porter, K.; Fink, S.; Mudd, C.; DeCesaro, J. 103 pp.; NREL Report No. SR-550-44508.