

July 2006 — September 2006

National Renewable Energy Laboratory ePubs Update

info



Basic Sciences
Bioenergy
Buildings
Distributed Energy Resources
Energy Policy and Analysis
Federal Energy Management Program
Hydrogen
Industry
National Renewable Energy Laboratory
Solar Energy—General
Solar Energy—Photovoltaics
Solar Energy—Radiation
Solar Energy—Thermal
Transportation
Wind Energy

Basic Sciences

Abe, Y.; Lee, S.H.; Tracy, C.E.; Pitts, J.R.; Deb, S.K. **Electrochromic Properties of Sputtered Ni Oxide Thin Films in Acidic KCl + H₂SO₄ Aqueous Solutions.** *Electrochemical and Solid-State Letters.* 2006; 9(8): pp. J31-J33.

Barabash, S.V.; Blum, V.; Muller, S.; Zunger, A. **Prediction of Unusual Stable Ordered Structures of Au-Pd Alloys via a First-Principles Cluster Expansion.** Article No. 035108. *Physical Review. B, Condensed Matter and Materials Physics.* 2006; 74: 22 pp.

Bhattacharya, R.; Phok, S.; Spagnol, P.; Chaudhuri, T. **Electrodeposited Biaxially Textured CeO₂ and CeO₂:Sm Buffer Layer for YBCO Superconductor Oxide Films.** Balachandran, U., ed. *Advances in Cryogenic Engineering: Transactions of the International Cryogenic Materials Conference (ICMC).* AIP Conference Proceedings, Vol. 52. Melville, NY: American Institute of Physics (AIP), 2006; pp. 751-757.

Chasteen, S.V.; Carter, S.A.; Rumbles, G. **Effect of Broken Conjugation on the Excited State: Ether Linkage in the Cyano-Substituted Poly(p-phenylene vinylene) Conjugated Polymer Poly(2,5,2',5'-tetrahexyloxy-8, 7'-dicyano-di-p-phenylene vinylene).** Article No. 214704. *Journal of Chemical Physics.* 2006; 124(21): 6 pp.

Chaudhuri, T.; Spagnol, P.; Phok, S.; Bhattacharya, R. **Effect of Seed Layer on Biaxial Texturing of Pulsed Laser Deposited YSZ Films on Electrodeposited Ir/Ni-W Tapes.** *Physica C.* 2006; 443: pp. 81-84.

Curtis, C.J.; Kaydanova, T.; van Hest, M.F.A.M.; Miedaner, A.; Garnett, E.; Ginley, D.S.; Smith, L.; Leenheer, A.; Collins, R.T. **Ink Jet Printed Metals and Conducting Polymers.** *Digital Fabrication 2005: Final Program and Proceedings of the conference held 18-22 September 2005, in Baltimore, Maryland.* Springfield, VA: The Society for Imaging Science and Technology (IS&T), 2005; pp. 160-163.

Dalpian, G.M.; Wei, S.-H. **Carrier Mediated Stabilization of Ferromagnetism in Semiconductors: Holes and Electrons.** *Physica Status Solidi B – Basic Research.* 2006; 243(9): pp. 2170-2187.

Dalpian, G.M.; Wei, S.-H. **Electron-Mediated Ferromagnetism and Negative s-d Exchange Splitting in Semiconductors.** Article No. 245204. *Physical Review. B, Condensed Matter and Materials Physics.* 2006; 73: 4 pp.

Du, M.-H.; Limpijumnong, S.; Zhang, S.B. **Hydrogen-Mediated Nitrogen Clustering in Dilute III-V Nitrides.** Article No. 075503. *Physical Review Letters.* 2006; 97(7): 4 pp.

DuBois, D.L.; Blake, D.M.; Miedaner, A.; Curtis, C.J.; DuBois, M.R.; Franz, J.A.; Linehan, J.C. **Hydride Transfer from Rhodium Complexes to Triethylborane.** *Organometallics*. 2006; 25(18): pp. 4414-4419.

Dudiy, S.V.; Zunger, A. **Searching for Alloy Configurations with Target Physical Properties: Impurity Design via a Genetic Algorithm Inverse Band Structure Approach.** Article No. 046401. *Physical Review Letters*. 2006; 97(4): 4 pp.

Felici, M.; Polimeni, A.; Capizzi, M.; Dudiy, S.V.; Zunger, A.; Buyanova, I.A.; Chen, W.M.; Xin, H.P.; Tu, C.W.

High Energy Optical Transitions in Ga(PN): Contribution from Perturbed Valence Band. Menendez, J. and Van de Walle, C.G., eds. *Physics of Semiconductors: 27th International Conference on the Physics of Semiconductors (ICPS-27), 26-30 July 2004, Flagstaff, Arizona.* AIP Conference Proceedings Vol. 772. Melville, NY: American Institute of Physics (AIP), 2005; pp. 265-266.

Fluegel, B.; Francoeur, S.; Mascarenhas, A.; Tixier, S.; Young, E.C.; Tiedje, T. **Giant Spin-Orbit Bowing in GaAs_{1-x}Bi_x.** Article No. 067205. *Physical Review Letters*. 2006; 97(6): 4 pp.

Franceschetti, A.; Dudiy, S.V.; Barabash, S.V.; Zunger, A.; Xu, J.; van Schilfgaarde, M. **First-Principles Combinatorial Design of Transition Temperatures in Multi-Component Systems: The Case of Mn in GaAs.** Article No. 047202. *Physical Review Letters*. 2006; 97(4): 4 pp.

Frank, A.J.; Kopidakis, N.; Neale, N.R. **Effect of an Adsorbent on Recombination and Band-Edge Movement in Dye-Sensitized TiO₂ Solar Cells: Evidence for Surface Passivation.** *Journal of Physical Chemistry B*. 2006; 110: pp. 12485-12489.

Ghirardi, M.L.; King, P.; Kosourov, S.; Forestier, M.; Zhang, L.; Seibert, M. **Chapter 11: Development of Algal Systems for Hydrogen Photoproduction; Addressing the Hydrogenase Oxygen-Sensitivity Problem.** Collings, A.F. and Critchley, C., eds. *Artificial Photosynthesis: From Basic Biology to Industrial Application*. Weinheim, Germany: Wiley-VCH GmbH & Co. KGaA, 2005; pp. 213-227.

Gregg, B.A.; Gledhill, S.E.; Scott, B. **Can True Space-Charge-Limited Currents be Observed in π-Conjugated Polymers.** Article No. 116104. *Journal of Applied Physics*. 2006; 99(11): 3 pp.

Karaiskaj, D.; Mascarenhas, A.; Adamcyk, M.; Young, E.C.; Tiedje, T. **Ultranarrow Photoluminescence Transitions of Nitrogen Cluster Bound Excitons in Dilute GaAsN.** Article No. 035208. *Physical Review B, Condensed Matter and Materials Physics*. 2006; 74(3): 4 pp.

Kim, K.; Seo, C.; Cheong, H.; Lee, S.H. **Photochromic Mechanism in a-WO₃ Thin Films Based on Raman Spectroscopic Studies.** *Journal of the Korean Physical Society*. June 2006; 48(6): pp. 1657-1660.

Li, J.; Wang, L.-W.; Wei, S.-H. **Electronic Structure of Semiconductor Nanocrystals.**

Chinese Journal of Semiconductors. February 2006; 27(2): pp. 191-196.

Li, Y.H.; Gong, X.G.; Wei, S.H. **Ab Initio All-Electron Calculation of Absolute Volume Deformation Potentials of IV-IV, III-V, and II-VI Semiconductors: The Chemical Trends.** Article No. 245206. *Physical Review. B, Condensed Matter and Materials Physics*. 2006; 73(24): 5 pp.

Liu, P.; Lee, S.H.; Yan, Y.; Tracy, C.E.; Turner, J.A. **Nanostructured Manganese Oxides as Lithium Battery Cathode Materials.** *Journal of Power Sources*. 2006; 158: pp. 659-662.

Lu, J.G.; Ye, Z.Z.; Yuan, G.D.; Zeng, Y.J.; Zhuge, F.; Zhu, L.P.; Zhao, B.H.; Zhang, S.B. **Electrical Characterization of ZnO-Based Homojunctions.** Article No. 053501. *Applied Physics Letters*. 2006; 89(5): 3 pp.

Luther, J.M.; Johnston, S.W.; Kurtz, S.R.; Ahrenkiel, R.K.; Collins, R.T. **Temperature-Dependent Dark Current Measurements in GaAsN Heterojunction Diodes.** Article No. 263502. *Applied Physics Letters*. 2006 ; 88(26): 3 pp.

Magri, R.; Zunger, A.; Kroemer, H. **Evolution of the Band Gaps and Band Edges of Quaternary $\text{Ga}_{1-y}\text{In}_y\text{As}_x\text{Sb}_{1-x}$ /InAs Alloys as a Function of Composition.** Menendez, J. and Van de Walle, C.G., eds. *Physics of Semiconductors: 27th International Conference on the Physics of Semiconductors (ICPS-27), 26-30 July 2004, Flagstaff, Arizona.* AIP Conference Proceedings Vol. 772. Melville, NY: American Institute of Physics (AIP), 2005; pp. 123-124.

McMahon, W.E.; Batyrev, I.G.; Hannappel, T.; Olson, J.M.; Zhang, S.B. **5-7-5 Line Defects on As/Si(100): A General Stress-Relief Mechanism for V/IV Surfaces.** Article No. 033304. *Physical Review. B, Condensed Matter and Materials Physics*. 2006; 74(3): 4 pp.

Miller, P.F.; de Souza, M.M.; Moratti, S.C.; Holmes, A.B.; Samuel, I.D.W.; Rumbles, G. **Equilibration of Intrachain and Interchain Excitations in Aggregates of a Cyano-Substituted Phenylene Vinylene Polymer.** *Polymer International*. 2006; 55: pp. 784-792.

Moon, C.-Y.; Wei, S.-H. **Band Gap of Hg Chalcogenides: Symmetry-Reduction-Induced Band Gap Opening of Materials with Inverted Band Structures.** Article No. 045205. *Physical Review. B, Condensed Matter and Materials Physics*. 2006; 74(4): 5 pp.

Narvaez, G.A.; Zunger, A. **Nominally Forbidden Transitions in the Interband Optical Spectrum of Quantum Dots.** Article No. 045316. *Physical Review. B, Condensed Matter and Materials Physics*. 2006; 74(4): 6 pp.

- Osorio-Guillen, J.; Zhao, Y.J.; Barabash, S.V.; Zunger, A. **Structural Stability of (Ga,Mn)As from First Principles: Random Alloys, Ordered Compounds, and Superlattices.** Article No. 035305. *Physical Review. B, Condensed Matter and Materials Physics.* 2006; 74(3): 9 pp.
- Raebiger, J.W.; Turner, J.W.; Noll, B.C.; Curtis, C.J.; Miedaner, A.; Cox, B.; DuBois, D.L. **Electrochemical Reduction of CO₂ to CO Catalyzed by a Bimetallic Palladium Complex.** *Organometallics.* 2006; 25(14): pp. 3345-3351.
- Simpson, L.J.; Parilla, P.A.; Blackburn, J.L.; Gennett, T.G.; Gilbert, K.E.H.; Engtrakul, C.; Dillon, A.C.; Heben, M.J. **H₂ Sorption Volumetric Measurements of Single Wall Carbon Nanotubes.** *Global Progress Toward Clean Energy: Proceedings of the 17th NHA Annual Hydrogen Conference, 12-16 March 2006, Long Beach, California (DVD-ROM).* Washington, DC: National Hydrogen Association, 2006; 14 pp.
- Soundararajan, R.; Lynn, K.G.; Awadallah, S.; Szeles, C.; Wei, S.H. **Study of Defect Levels in CdTe Using Thermoelectric Effect Spectroscopy.** *Journal of Electronic Materials.* June 2006; 35(6): pp. 1333-1340.
- Trimarchi, G.; Graf, P.; Zunger, A. **Exploring the Configurational Space of Binary Alloys: Different Sampling for Different Cell Shapes.** Article No. 014204. *Physical Review. B, Condensed Matter and Materials Physics.* 2006; 74(1): 8 pp.
- Zeng, Y.J.; Ye, Z.Z.; Xu, W.Z.; Lu, J.G.; He, H.P.; Zhu, L.P.; Zhao, B.H.; Che, Y.; Zhang, S.B. **p-Type Behavior in Nominally Undoped ZnO Thin Films by Oxygen Plasma Growth.** Article No. 262103. *Applied Physics Letters.* 2006; 88(26): 3 pp.
- Zhang, Y.H.P.; Himmel, M.E.; Mielenz, J.R. **Outlook for Cellulase Improvement: Screening and Selection Strategies.** *Biotechnology Advances.* 2006; 24: pp. 452-481.
- Zhao, Y.; Dillon, A.C.; Kim, Y.H.; Heben, M.J.; Zhang, S.B. **Self-Catalyzed Hydrogenation and Dihydrogen Adsorption on Titanium Carbide Nanoparticles.** *Chemical Physics Letters.* 2006; 425: pp. 273-277.

Bioenergy

[Biodiesel Handling and Use Guidelines \(Third Edition\)](#). September 2006; 69 pp. DOE/GO-102006-2358.

[From Biomass to Biofuels: NREL Leads the Way](#). National Renewable Energy Laboratory (Brochure). August 2006; 6 pp. NREL/BR-510-39436.

[Jet Fuel from Microalgal Lipids](#). National Renewable Energy Laboratory (NREL) (Fact Sheet). July 2006; 2 pp. NREL/FS-840-40352.

Campbell, J.; Chen, T.-P.; Gruber, J.; Hazelden, G.; Hobbs, R.; Moore, G.; Paster, M.; Ringer, M.; Unnasch, S. **Hydrogen Delivery Infrastructure Option Analysis**. *Global Progress Toward Clean Energy: Proceedings of the 17th NHA Annual Hydrogen Conference, 12-16 March 2006, Long Beach, California (DVD-ROM)*. Washington, DC: National Hydrogen Association, 2006; 19 pp.

Ding, S.Y. **Thermotolerant Cellulase**. *Industrial Bioprocessing*. July 2006; 28(7): pp. 3-4.

Mohagheghi, A.; Ruth, M.; Schell, D.J. **Conditioning Hemicellulose Hydrolysates for Fermentation: Effects of Overliming pH on Sugar and Ethanol Yields**. *Process Biochemistry*. 2006; 41: pp. 1806-1811.

Schell, D. [National Bioenergy Center Sugar Platform Integration Project: Quarterly Update #11, April-June 2006](#). July 2006; 3 pp. DOE/GO-102006-2092.

Zuo, Y.; Maness, P.C.; Logan, B.E. **Electricity Production from Steam-Exploded Corn Stover Biomass**. *Energy & Fuels*. 2006; 20: pp. 1716-1721.

[Highlighting High Performance: Whitman Hanson Regional High School; Whitman, Massachusetts.](#) June 2006; 4 pp.
NREL/BR-550-39261.

Anderson, R.; Christensen, C.; Horowitz, S. **[Program Design Analysis using BEopt Building Energy Optimization Software: Defining a Technology Pathway Leading to New Homes with Zero Peak Cooling Demand; Preprint.](#)** August 2006; 16 pp. To be presented at the 2006 ACEEE Summer Study on Energy Efficiency in Buildings, 13-18 August 2006, Pacific Grove, California. NREL/CP-550-39821.

Building Industry Research Alliance (BIRA); Building Science Consortium (BSC); Consortium for Advanced Residential Buildings (CARB); Florida Solar Energy Center (FSEC); IBACOS; National Renewable Energy Laboratory (NREL) **[Building America Residential System Research Results: Achieving 30% Whole House Energy Savings Level in Cold Climates.](#)** August 2006; 202 pp. NREL/SR-550-38783.

Burch, J.; Heater, M.; Brandemuhl, M.; Krarti, M. **Northward Market Extension for Passive Solar Water Heaters by using Pipe Freeze Protection with Freeze-Tolerant Piping.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM).* Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. For preprint version see [NREL/CP-550-39664](#).

Burch, J.; Heater, M.; Brandemuhl, M.; Krarti, M. **Pipe Freeze Prevention for Passive Solar Water Heaters Using a Room-Air Natural Convection Loop.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM).* Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. For preprint version see [NREL/CP-550-39722](#).

Burch, J.; Shoukas, G.; Brandemuhl, M.; Krarti, M. **Modeling and Test-and-Rate Methods for Innovative Thermosiphon Solar Water Heaters.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM).* Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. For preprint version see [NREL/CP-550-39734](#).

Christensen, C.; Anderson, R.; Horowitz, S.; Courtney, A.; Spencer, J. [**BEopt™ Software for Building Energy Optimization: Features and Capabilities**](#). August 2006; 21 pp. NREL/TP-550-39929.

Eastment, M.; Hendron, R. [**Method for Evaluating Energy Use of Dishwashers, Clothes Washers, and Clothes Dryers: Preprint**](#). August 2006; 15 pp. To be presented at the 2006 ACEEE Summer Study on Energy Efficiency in Buildings, 13-18 August 2006, Pacific Grove, California. NREL/CP-550-39769.

Ellis, P.G.; Griffith, B.T.; Long, N.; Torcellini, P.A.; Crawley, D. [**Automated Multivariate Optimization Tool for Energy Analysis: Preprint**](#). July 2006; 10 pp. To be presented at IBPSA SimBuild 2006 Conference, 2-4 August 2006, Cambridge, Massachusetts. NREL/CP-550-40353.

Givler, T.; Christensen, C.; Brandemuehl, M. **Analyzing Climate-Optimized Designs for Habitat for Humanity**. Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Hayter, S.J. **Marian E. Koshland Integrated Natural Science Center**. *Heating/Piping/Air Conditioning HPAC Engineering*. May 2006; 78(5): pp. 51-60.

Hendron, R. [**Whole-House Energy Analysis Procedures for Existing Homes: Preprint**](#). August 2006; 13 pp. To be presented at SimBuild 2006 Conference, 2-4 August 2006, Cambridge, Massachusetts. NREL/CP-550-39560.

Hendron, R.; Eastment, M. [**Development of an Energy-Savings Calculation Methodology for Residential Miscellaneous Electric Loads: Preprint**](#). August 2006; 15 pp. To be presented at the 2006 ACEEE Summer Study on Energy Efficiency in Buildings, 13-18 August 2006, Pacific Grove, California. NREL/CP-550-39551.

Hendron, R.; Eastment, M.; Hancock, E.; Barker, G.; Reeves, P. [**Evaluation of a High-Performance Solar Home in Loveland, Colorado: Preprint**](#). August 2006; 26 pp. To be published in The Journal of Solar Energy Engineering. NREL/JA-550-40374.

Judkoff, R.; Neymark, J. [**Model Validation and Testing: The Methodological Foundation of ASHRAE Standard 140; Preprint**](#). July 2006; 15 pp. Presented at the ASHRAE 2006 Annual Meeting, 24-29 June 2006, Quebec City, Canada. NREL/CP-550-40360.

Lowenstein, A.; Slayzak, S.; Kozubal, E. **Zero Carryover Liquid-Desiccant Air Conditioner for Solar Applications.** Paper No. ISEC2006-99079. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado.* Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 11 pp. For preprint version see [NREL/CP-550-39798](#).

Lowenstein, A.; Slayzak, S.; Kozubal, E. **Zero Carryover Liquid-Desiccant Air Conditioner for Solar Applications: Preprint.** July 2006; 14 pp. Prepared for the ASME International Solar Energy Conference (ISEC2006), 8-13 July 2006, Denver, Colorado. NREL/CP-550-39798.

Norton, P.; Christensen, C. **Cold-Climate Case Study for Affordable Zero Energy Homes.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM).* Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. For preprint version see [NREL/CP-550-39678](#).

Norton, P.; Christensen, C. **Cold-Climate Case Study for Affordable Zero Energy Homes: Preprint.** July 2006; 9 pp. To be presented at Solar 2006 Conference, 9-13 July 2006, Denver, Colorado NREL/CP-550-39678.

Rosta, S.; Hurt, R.; Boehm, R.; Hale, M.J. **Monitoring of a Zero-Energy-House.** Paper No. ISEC2006-99086. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado.* Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 7 pp.

Distributed Energy Resources

Lynch, J.; John, V.; Danial, S.M.; Benedict, E.; Vihinen, I.; Kroposki, B.; Pink, C. [Flexible DER Utility Interface System: Final Report, September 2004 – May 2006.](#) August 2006; 222 pp. NREL/TP-560-39876.

Energy Policy and Analysis

Examining the Potential of Renewable Energy. National Renewable Energy Laboratory (NREL) (Brochure). September 2006; 2 pp. NREL/BR-620-40577.

Aabakken, J., Compiler. **Power Technologies Energy Data Book - Fourth Edition.** August 2006; 235 pp. NREL/TP-620-39728.

Blair, N.; Mehos, M.; Short, W.; Heimiller, D. **Concentrating Solar Deployment System (CSDS) — A New Model for Estimating U.S. Concentrating Solar Power (CSP) Market Potential.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 7 pp. For preprint version see [NREL/CP-620-39682](#).

Blair, N.; Short, W.; Denholm, P.; Heimiller, D. **Long-Term National Impacts of State-Level Policies: Preprint.** June 2006; 20 pp. To be presented at WindPower 2006, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/CP-620-40105.

Denholm, P.; Margolis, R. **Very Large-Scale Deployment of Grid-Connected Solar Photovoltaics in the United States: Challenges and Opportunities.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 5 pp. For preprint version see [NREL/CP-620-39683](#).

Jacobson, D.; O'Connor, P.; High, C.; Brown, J. **Final Report on the Clean Energy/Air Quality Integration Initiative Pilot Project of the U.S. Department of Energy's Mid-Atlantic Regional Office.** August 2006; 138 pp. DOE/GO-102006-2354.

Ma, S.; Yin, H.; Kline, D.M. **Efficient System Design and Sustainable Finance for China's Village Electrification Program: Preprint.** July 2006; 9 pp. To be presented at the ASES Solar 2006 Conference and Exhibition, 8-13 July 2006, Denver, Colorado. NREL/CP-710-39588.

Perez, R.; Margolis, R.; Kmiecik, M.; Schwab, M.; Perez, M. **Update: Effective Load Carrying Capability of Photovoltaics in the United States.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. For preprint version see [NREL/CP-620-40068](#).

Renne, D.; Beyer, H.G.; Wald, L.; Meyer, R.; Perez, R.; Stackhouse, P. **Solar Resource Knowledge Management: A New Task of the International Energy Agency.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Renne, D.; Kelly, M.; Lilienthal, P.; Gilman, P.; Baring-Gould, I.; Heimiller, D.; Milbrandt, A.; Ferguson, T. **Strategic Approach for Promoting Access to Clean Energy Development.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 5 pp.

Robinson, D.G.; Arent, D.J.; Johnson, L. **Impact of Distributed Energy Resources on the Reliability of Critical Telecommunications Facilities: Preprint.** June 2006; 10 pp. To be presented at INTELEC 2006 (International Telecommunications Energy Conference), 10-14 September 2006, Providence, Rhode Island. NREL/CP-620-40220.

Shenghong, M.; Huanying, Y.; Kline, D.M. **Efficient System Design and Sustainable Finance for China's Village Electrification Program.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Short, W.; Ferguson, T.; Leifman, M. **Modeling of Uncertainties in Major Drivers in U.S. Electricity Markets: Preprint.** September 2006; 21 pp. To be presented at the 26th USAEE/IAEE North American Conference; 24-27 September 2006; Ann Arbor, Michigan. NREL/CP-620-40451.

Walker, A.; Heimiller, D.; Kandt, A.; Sprunt-Crawley, A. **Renewable Energy Screening: Identifying and Prioritizing Solar Opportunities in Federal Facilities.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM).* Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Walters, T.; Savage, S.; Brown, J. **USDA Section 9006 Program: Status and Energy Benefits of Grant Awards in FY 2003-2005.** August 2006; 51 pp. NREL/TP-710-40465.

Wiser, R.; Cappers, P.; Bolinger, M.; Margolis, R. **Letting the Sun Shine on Solar Costs: An Empirical Investigation of Photovoltaic Cost Trends in California.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM).* Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. For complete technical report see [NREL/TP-620-39300](#).

Federal Energy Management Program (FEMP)

[**FEMP Information Resources 2006 \(CD-ROM\).**](#) August 2006; DOE/GO-102006-2321.

[**FEMP Sustainability Resources \(CD-ROM\).**](#) August 2006; DOE/GO-102006-2236.

[**Federal Fleet Requirements, EPAct and E.O. 13149: How Do Federal Fleets Comply?**](#) Federal Energy Management Program (FEMP) Fact Sheet. July 2006; 2 pp. (This is a revision of the fact sheet published July 2004.) DOE/GO-102006-2329.

Hydrogen

Brady, M.P.; Yang, B.; Wang, H.; Turner, J.A.; More, K.L.; Wilson, M.; Garzon, F. **Formation of Protective Nitride Surfaces for PEM Fuel Cell Metallic Bipolar Plates.** *JOM*. August 2006; 58(8): pp. 50-57.

Hock, S. **DOE/NREL Hydrogen Program.** *Global Progress Toward Clean Energy: Proceedings of the 17th NHA Annual Hydrogen Conference, 12-16 March 2006, Long Beach, California (DVD-ROM)*. Washington, DC: National Hydrogen Association, 2006; 23 pp.

Kroposki, B.; Levene, J.; Harrison, K.; Sen, P.K.; Novacheck, F. [**Electrolysis: Information and Opportunities for Electric Power Utilities.**](#) September 2006; 33 pp. NREL/TP-581-40605.

Ruth, M.F.; Vanderveen, K.B.; Sa, T.J. [**Use of Federated Object Modeling to Develop a Macro-System Model for the U.S. Department of Energy's Hydrogen Program; Preprint.**](#) July 2006; 11 pp. To be presented at the 2006 Winter Simulation Conference, 3-6 December 2006, Monterey, California. NREL/CP-150-40222.

Wipke, K.; Welch, C.; Thomas, H.; Sprik, S.; Gronich, S.; Garbak, J.; Hooker, D. **Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project: Progress Update (Presentation).** *Global Progress Toward Clean Energy: Proceedings of the 17th NHA Annual Hydrogen Conference, 12-16 March 2006, Long Beach, California (DVD-ROM)*. Washington, DC: National Hydrogen Association, 2006; 31 pp.

Wipke, K.; Welch, C.; Thomas, H.; Sprik, S.; Gronich, S.; Garbak, J.; Hooker, D. **Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project: Progress Update.** *Global Progress Toward Clean Energy: Proceedings of the 17th NHA Annual Hydrogen Conference, 12-16 March 2006, Long Beach, California (DVD-ROM)*. Washington, DC: National Hydrogen Association, 2006; 21 pp.

Industry

Is Your Plant Prepared for a Hurricane? Industrial Technologies Program (ITP) (Fact Sheet). July 2006; 2 pp. DOE/GO-102006-2345.

Jump-Start Your Plant's Energy Savings with Quick PEP (Plant Energy Profiler). Industrial Technologies Program (ITP) BestPractices: Software Tools (Fact Sheet). July 2006; 2 pp. DOE/GO-102006-2335.

National Renewable Energy Laboratory

[NREL: National Renewable Energy Laboratory \(2006 Overview\)\(Brochure\)](#). August 2006; 2 pp. NREL/BR-860-40487.

Brown, H.; Gwinner, D.; Miller, M.; Pitchford, P. [National Renewable Energy Laboratory 2005 Research Review](#). June 2006; 24 pp. NREL/BR-840-38668.

Solar Energy—General

[2007 Solar Decathlon: Powered by the Sun \(Brochure\)](#). June 2006; 4 pp. DOE/GO-102006-2311.

Robichaud, R. **Hybrid Renewable Power for the Solar Decathlon's Zero Energy Village.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 16 pp.

Wassmer, M.R.; Warner, C.L. **Solar Decathlon Results and Strategies: A Closer Look.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 8 pp.

Solar Energy—Photovoltaics

[Analytical Microscopy](#). National Renewable Energy Laboratory (NREL) Measurements & Characterization (Brochure). June 2006; 4 pp. NREL/BR-520-40120.

[Device Performance](#). National Renewable Energy Laboratory (NREL) Measurements & Characterization (Brochure). June 2006; 4 pp. NREL/BR-520-40123.

[Electro-Optical Characterization](#). National Renewable Energy Laboratory (NREL) Measurements & Characterization (Brochure). June 2006; 4 pp. NREL/BR-520-40121.

[Surface Analysis](#). National Renewable Energy Laboratory (NREL) Measurements & Characterization (Brochure). June 2006; 4 pp. NREL/BR-520-40122.

Anderson, T.J.; Li, S.S.; Crisalle, O.D.; Craciun, V. [Fundamental Materials Research and Advanced Process Development for Thin-Film CIS-Based Photovoltaics: Final Technical Report, 2 October 2001 – 30 September 2005](#). September 2006; 226 pp. Work performed by the University of Florida, Gainesville, Florida. NREL/SR-520-40568.

Botkin, J. [Accelerating PV Cost Effectiveness Through Systems Design, Engineering, and Quality Assurance: Phase I Annual Technical Report, 4 November 2004 – 3 November 2005](#). July 2006; 87 pp. Work performed by PowerLight Corporation, Berkeley, California. NREL/SR-520-40335.

Branz, H.M. and Wang, Q., Inventors. **Stacked Switchable Element and Diode Combination**. U.S. Patent No. 7,067,850 B2. 27 June 2006; 10 pp. Assignee: Midwest Research Institute, Kansas City, Missouri. NREL/PT-520-40715.

Buonassisi, T.; Istratov, A.A.; Pickett, M.D.; Marcus, M.A.; Ciszek, T.F.; Weber, E.R. **Metal Precipitation at Grain Boundaries in Silicon: Dependence on Grain Boundary Character and Dislocation Decoration**. Article No. 042102. *Applied Physics Letters*. 2006; 89(4): 3 pp.

Carter, S.A. [Polymer Hybrid Photovoltaics for Inexpensive Electricity Generation: Final Technical Report, 1 September 2001 – 30 April 2006](#). July 2006; 18 pp. Work performed by University of California, Santa Cruz, California. NREL/SR-520-40044.

Contreras, M.; Barnes, T.; van de Lagemaat, J.; Rumbles, G.; Coutts, T.J.; Weeks, C.; Glatkowski, P.; Levitsky, I.; Peltola, J. [Application of Single Wall Carbon Nanotubes as Transparent Electrodes in Cu\(In,Ga\)Se₂-Based Solar Cells: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39914.

Curtis, C.J.; van hest, M.; Miedaner, A.; Kaydanova, T.; Smith, L.; Ginley, D.S. [Multi-Layer Inkjet Printed Contacts for Silicon Solar Cells: Preprint](#). May 2006; 5 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39902.

Curtis, C.J.; van hest, M.F.A.M.; Miedaner, A.; Kaydanova, T.; Smith, L.; Ginley, D.S. [Multi-Layer Inkjet Printed Contacts for Si Solar Cells \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39919.

Dalpian, G.M.; Yan, Y.; Wei, S.H. **Impurity-Induced Phase Stabilization of Semiconductors**. Article No. 011907. *Applied Physics Letters*. 2006; 89(1): 3 pp.

del Cueto, J.A.; Sekulic, B.R. [Unlikely Combination of Experiments With a Novel High-Voltage CIGS Photovoltaic Array: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39877.

Demtsu, S.; Albin, D.; Sites, J. [Role of Copper in the Performance of CdS/CdTe Solar Cells \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39981.

Demtsu, S.; Albin, D.; Sites, J. [Role of Copper in the Performance of CdS/CdTe Solar Cells: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39923.

Dhere, R.; Ramanathan, K.; Scharf, J.; Moutinho, H.; To, B.; Duda, A.; Noufi, R. [Investigation of Cd_{1-x}Mg_xTe Alloys for Tandem Solar Cell Applications: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39899.

Dhere, R.; Ramanathan, K.; Scharf, J.; Moutinho, H.; To, B.; Duda, A.; Noufi, R. [Investigation of Cd_{1-x}Mg_xTe Alloys for Tandem Solar Cell Applications \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39969.

Emery, K.; Winter, S.; Pinegar, S.; Nalley, D. [**Linearity Testing of Photovoltaic Cells \(Poster\)**](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39860.

Emery, K.; Winter, S.; Pinegar, S.; Nalley D. [**Linearity Testing of Photovoltaic Cells: Preprint**](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39854.

Fern, F.J.; Turner, J.A.; Meng, F.; Herring, A.M. **Sol-Gel SiO₂-Polymer Hybrid Heteropoly Acid-Based Proton Exchange Membranes**. Paper No. 0885-A01-10. Dillon, A. et al., eds. *Hydrogen Cycle—Generation, Storage and Fuel Cells: Proceedings of the Materials Research Society Fall Meeting, Symposium A, 28 November – 2 December 2005, Boston, Massachusetts*. Materials Research Society Symposium Proceedings, Vol. 885. Warrendale, PA: Materials Research Society (MRS), 2006; pp. 51-57. NREL/CP-520-39129.

Friedman, D.J.; Geisz, J.F.; Norman, A.G.; Wanlass, M.W.; Kurtz, S.R.

[**0.7-eV GaInAs Junction for a GaInP/GaAs/GaInAs\(1-eV\)/GaInAs\(0.7-eV\) Four-Junction Solar Cell: Preprint**](#). May 2006; 7 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39913.

Friedman, D.J.; Mitchell, R.L.; Keyes, B.M.; Bower, W.I.; King, R.; Mazer, J. [**PV Manufacturing R&D Project Status and Accomplishments under 'In-Line Diagnostics and Intelligent Processing' and 'Yield, Durability and Reliability': Preprint**](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39904.

Gessert, T.A.; Asher, S.; Johnston, S.; Duda, A.; Young, M.R.; Moriarty, T. [**Formation of ZnTe:Cu/Ti Contacts at High Temperature for CdS/CdTe Devices: Preprint**](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39804.

Green, M.A.; Emery, K.; King, D.L.; Hisikawa, Y.; Warta, W. **Solar Cell Efficiency Tables (Version 28)**. *Progress in Photovoltaics: Research and Applications*. 2006; 14(5): pp. 455-461.

Hetzer, M.J.; Strzhemechny, Y.M.; Gao, M.; Goss, S.; Contreras, M.A.; Zunger, A.; Brillson, L.J. **On Microscopic Compositional and Electrostatic Properties of Grain Boundaries in Polycrystalline CuIn_{1-x}Ga_xSe₂**. *Journal of Vacuum Science and Technology A, Vacuum, Surfaces, and Films*. July/August 2006; 24(4): pp. 1739-1745.

Ivetic, T.; Nikolic, M.V.; Young, D.L.; Vasiljevic-Radovic, D.; Urosevic, D. **Photoacoustic and Optical Properties of Zinc-Stannate Thin Films**. *Materials Science Forum*. July 2006; 518: pp. 465-470.

Jiang, C.-S.; Friedman, D.J.; Moutinho, H.R.; Al-Jassim, M.M. [Profiling the Built-In Electrical Potential in III-V Multijunction Solar Cells \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39864.

Jiang, C.-S.; Friedman, D.J.; Moutinho, H.R.; Al-Jassim, M.M. [Profiling the Built-in Electrical Potential in III-V Multijunction Solar Cells: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39883.

Jiang, C.-S.; Moutinho, H.R.; Al-Jassim, M.M.; Kazmerski, L.L.; Yan, B.; Owens, J.M.; Yang, J.; Guha, S. [Distribution of Local Open-Circuit Voltage on Amorphous and Nanocrystalline Mixed-Phase Si:H and SiGe:H Solar Cells: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39882.

Jiang, C.-S.; Moutinho, H.R.; Al-Jassim, M.M.; Kazmerski, L.L.; Yan, B.; Yang, J.; Guha, S. [Distribution of Local Open-Circuit Voltage on Amorphous and Nanocrystalline Mixed-Phase Si:H and SiGe:H Solar Cells \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39865.

Johnston, S.W.; Kurtz, S. **Comparison of a Dominant Electron Trap in *n*-Type and *p*-Type GaNAs using Deep-Level Transient Spectroscopy**. *Journal of Vacuum Science and Technology A, Vacuum, Surfaces and Films*. Papers from the 52nd International AVS Symposium, October 2005, Boston, Massachusetts. July/August 2006; 24(4): pp. 1252-1257.

Johnston, S.W.; Kurtz, S.R.; Crandall, R.S. **Characterization of a Dominant Electron Trap in GaNAs Using Deep-Level Transient Spectroscopy**. *Progress in Semiconductor Materials V--Novel Materials and Electronic and Optoelectronic Applications: Proceedings of the Materials Research Society Symposium, November 28-December 1, 2005, Boston, Massachusetts*. Warrendale, PA: Materials Research Society (MRS), 2006; 891: pp. 521-526.

Jorgensen, G.J.; Terwilliger, K.M.; Bingham, C.E. **Durability of Polymeric Glazing and Absorber Materials**. Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Jorgensen, G.J.; Terwilliger, K.M.; DelCueto, J.A.; Glick, S.H.; Kempe, M.D.; Pankow, J.W.; Pern, F.J.; McMahon, T.J. **Moisture Transport, Adhesion, and Corrosion Protection of PV Module Packaging Materials.** *Solar Energy Materials and Solar Cells.* 2006; 90: pp. 2739-2775.

Kempe, M. **Modeling of Rates of Moisture Ingress into Photovoltaic Modules.** *Solar Energy Materials and Solar Cells.* 2006; 90: pp. 2720-2738.

Kempe, M.D.; Jorgensen, G.J.; Terwilliger, K.M.; McMahon, T.J.; Kennedy, C.E.; Borek, T.T. [**Ethylene-Vinyl Acetate Potential Problems for Photovoltaic Packaging: Preprint.**](#) May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39915.

Kempe, M.D.; Jorgensen, G.J.; Terwilliger, K.M.; McMahon, T.J.; Kennedy, C.E.; Borek, T.T. [**Potential Problems with Ethylene-Vinyl Acetate for Photovoltaic Packaging \(Poster\).**](#) May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39977.

King, R.R.; Law, DC; Fetzer, C.M.; Sherif, R.A.; Edmondson, K.M.; Kurtz, S.; Kinsey, G.S.; Cotal, H.L.; Krut, D.D.; Ermer, J.H.; Karam, N.H. **Pathways to 40%-Efficient Concentrator Photovoltaics.** Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain.* Munich, Germany: WIP-Renewable Energies, 2005; pp. 118-123.

Levi, D.; Iwaniczko, E.; Page, M.; Branz, H.; Wang, T. [**Silicon Heterojunction Solar Cell Characterization and Optimization Using In Situ and Ex Situ Spectroscopic Ellipsometry: Preprint.**](#) May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39932.

Levi, D.H.; Teplin, C.W.; Iwaniczko, E.; Yan, Y.; Wang, T.H.; Branz, H.M. **Real Time Spectroscopic Ellipsometry Studies of the Growth of Amorphous and Epitaxial Silicon for Photovoltaic Applications.** *Journal of Vacuum Science and Technology. A, Vacuum, Surfaces, and Films.* July/August 2006; 24(4): pp. 1676-1683.

Li, X.; Asher, S.E.; Limpijumnong, S.; Zhang, S.B.; Wei, S.-H.; Barnes, T.M.; Coutts, T.J.; Noufi, R. **Unintentional Doping and Compensation Effects of Carbon in Metal-Organic Chemical-Vapor Deposition Fabricated ZnO Thin Films.** *Journal of Vacuum Science Technology. A, Vacuum, Surfaces, and Films.* September 2006; 24(5): pp. 1213-1217.

Mahan, A.H.; Ahrenkiel, S.P.; Roy, B.; Schropp, R.E.I.; Li, H.; Ginley, D.S. [On the Effect of the Film Hydrogen Content and Deposition Type on the Grain Nucleation and Grain Growth During Crystallization of a-Si:H Films: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39901.

Mahan, A.H.; Ahrenkiel, S.P.; Roy, B.; Schropp, R.E.I.; Li, H.; Ginley, D.S. [On the Effect of the Hydrogen Content and Deposition Type on the Grain Nucleation and Grain Growth during Crystallization of a-Si:H Films \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39900.

Marion, B. **Digital Camera Based Site Evaluation Tool**. Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 5 pp.

Marion, B.; Anderberg, M.; Gray-Hann, P. **Recent Upgrades and Revisions to PVWATTS**. Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp. NREL/CP-520-39567.

McConnell, R.; Symko-Davies, M. **High-Performance PV Future: III-V Multijunction Concentrators**. Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain*. Munich, Germany: WIP-Renewable Energies, 2005; pp. 26-30.

McConnell, R.; Symko-Davies, M. [Multijunction Photovoltaic Technologies for High-Performance Concentrators: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39791.

McConnell, R.D.; Lasich, J.B.; Elam, C. **Hybrid Solar Concentrator PV System for the Electrolytic Production of Hydrogen**. Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain*. Munich, Germany: WIP-Renewable Energies, 2005; pp. 167-170.

McMahon, T.J.; Jorgensen, G.J. [Adhesion and Thin-Film Module Reliability: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39732.

Metzger, W.K.; Romero, M.J.; Dippo, P.; Young, M. [Characterizing Recombination in CdTe Solar Cells with Time-Resolved Photoluminescence: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39926.

Moutinho, H.R.; Dhore, R.G.; Jiang, C.-S.; Al-Jassim, M.M.; Kazmerski, L.L. **Electrical Properties of CdTe/CdS Solar Cells Investigated with Conductive Atomic Force Microscopy**. *Thin Solid Films*. 2006; 514: pp. 150-155.

Moutinho, H.R.; Dhore, R.G.; Jiang, C.-S.; Gessert, T.A.; Duda, A.M.; Young, M.; Metzger, W.K.; Li, X.; Al-Jassim, M.M. [Cross-Sectional Conductive Atomic Force Microscopy of CdTe/CdS Solar Cells: Effects of Etching and Back-Contact Processes: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39802.

Noufi, R.; Yan, Y.; Jones, K.M.; Ramanathan, K.; Al-Jassim, M.M.; Stanbery, B.J. **Chemical-Fluctuation-Induced Nanodomains in Cu(In,Ga)Se₂ Films**. Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain*. Munich, Germany: WIP-Renewable Energies, 2005; pp. 1744-1747.

Noufi, R.; Zweibel, K. [High-Efficiency CdTe and CIGS Thin-Film Solar Cells: Highlights and Challenges: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39894.

Nowlan, M.J.; Murach, J.M.; Sutherland, S.F.; Miller, DC; Moore S. B.; Hogan, S.J. [Development of Automated Production Line Processes for Solar Brightfield Modules: Final Annual Technical Progress Report, 1 July 2004 – 15 October 2005](#). August 2006; 38 pp. Work performed by Spire Corporation, Bedford, Massachusetts NREL/SR-520-40406.

Olson, J.M.; McMahon, W.E.; Kurtz, S. [Effect of Sb on the Properties of GaInP Top Cells: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39903.

Page, M.R.; Iwaniczko, E.; Xu, Y.; Wang, Q.; Yan, Y.; Roybal, L.; Branz, H.M.; Wang, T.H. [Well-Passivated a-Si:H Back Contacts for Double-Heterojunction Silicon Solar Cells: Preprint](#). May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39911.

Pankow, J.W.; Glick, S.H. [Plasma Surface Modification of Polymer Backsheets: Origins of Future Interfacial Barrier/Backsheet Failure \(Poster\)](#). May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39954.

Posey-Eddy, F. [Renewable Energy Academic Partnerships \(REAP\) Student Summer Research Program Review Meeting, 7 August 2006, Denver, Colorado \(Program and Abstracts\)](#). August 2006; 38 pp. NREL/BK-520-40389.

Ptak, A.J.; Friedman, D.J.; Kurtz, S.; Reedy, R.C.; Young, M.; Jackrel, D.B.; Yuen, H.B.; Bank, S.R.; Wistey, M.A.; Harris Jr., J.S. **Calcium Impurities in Enhanced-Depletion-Width GaInNAs Grown by Molecular-Beam Epitaxy**. *Journal of Vacuum Science and Technology. A, Vacuum, Surfaces, and Films*. May/June 2006; 24(3): pp. 1540-1543.

Ramanathan, K.; Keane, J.C.; To, B.; Dhore, R.G.; Noufi, R. **Potential for High Performance in CIGS Solar Cells: A Laboratory Perspective**. Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain*. Munich, Germany: WIP-Renewable Energies, 2005; pp. 1695-1698.

Stradins, P.; Branz, H.M.; Hu, J.; Ward, S.; Wang, Q. **Combinatorial Studies of Switching and Solid-Phase Crystallization in Amorphous Silicon**. Paper No. 0894-LL02-01. Fasolka, M.J., et al., eds. *Combinatorial Methods and Informatics in Materials Science: Proceedings of the Materials Research Society Fall Meeting, 28 November–1 December 2005, Boston, Massachusetts*. Materials Research Society Symposium Proceedings, Vol. 894. Warrendale, PA: Materials Research Society, 2006; pp. 35-44.

Symko-Davies, M.; Noufi, R. **Future in High-Performance PV: Polycrystalline Thin-Film Tandem Cells**. Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain*. Munich, Germany: WIP-Renewable Energies, 2005; pp. 1721-1724.

Tang, Y.; TamizhMani, G.; Ji, L.; Osterwald, C. **Outdoor Energy Rating of Photovoltaic Modules: Module Temperature Prediction and Spectral Mismatch Analysis**. Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain*. Munich, Germany: WIP-Renewable Energies, 2005; pp. 2051-2054.

Tarrant, D.E.; Gay, R.R. [CIS Modules Process R&D: Final Technical Report, October 2005–June 2006](#). July 2006; 80 pp. Work performed by Shell Solar Industries, Camarillo, California NREL/SR-520-40242.

Teeter, G. **Conceptual Design of a Deposition System for Uniform and Combinatorial Synthesis of Multinary Thin-Film Materials via Open-Boat Physical-Vapor Deposition**. *Journal of Vacuum Science Technology. A, Vacuum, Surfaces, and Films*. 2006; 24(4): pp. 1119-1127.

Teeter, G. **Physical-Vapor Deposition Flux-Distribution Calculations for Static and Rotating Substrates: Derivation of the Deposition Geometry for Optimal Film-Thickness Uniformity.** *Journal of Vacuum Science Technology. A, Vacuum, Surfaces, and Films.* 2006; 24(4): pp. 1112-1118.

van de Lagemaat, J.; Barnes, T.M.; Rumbles, G.; Shaheen, S.E.; Coutts, T.J.; Weeks, C.; Levitsky, I.; Peltola, J.; Glatkowski, P. **Organic Solar Cells with Carbon Nanotubes Replacing In₂O₃:Sn as the Transparent Electrode.** Article No. 233503. *Applied Physics Letters.* 2006; 88(23): 3 pp.

van der Heide, A.; Winter, S.; Moriarty, T.; Zaaiman, W. **Comparison Between Large Reference Cells Calibrated by ESTI-JRC, NREL and PTB, Performed at ECN.** Palz, W., Ossenbrink, H., and Helm, P., eds. *Twentieth European Photovoltaic Solar Energy Conference: Proceedings of the International Conference, 6-10 June 2005, Barcelona, Spain.* Munich, Germany: WIP-Renewable Energies, 2005; pp. 2055-2058.

van Hest, M.F.A.M.; Leenheer, A.J.; Perkins, J.D.; Teplin, C.W.; Ginley, D.S. [**Texture Control in Cerium Oxide Films \(Poster\).**](#) May 2006; 1 p. Prepared for the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/PO-520-39889.

von Roedern, B.; Ullal, H.S.; Zweibel, K. [**Polycrystalline Thin Film Photovoltaics: From the Laboratory to Solar Fields; Preprint.**](#) May 2006; 6 pp. Presented at the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion (WCPEC-4), 7-12 May 2006, Waikoloa, Hawaii. NREL/CP-520-39838.

Wanlass, M.W. and Mascarenhas, A., Inventors. **Voltage-Matched, Monolithic, Multi-Band-Gap Devices.** U.S. Patent No. 7,095,050 B2. 22 August 2006; 32 pp. Assignee: Midwest Research Institute, Kansas City, Missouri NREL/PT-520-40717.

Wohlgemuth, J.; Narayanan, M. [**Large-Scale PV Module Manufacturing Using Ultra-Thin Polycrystalline Silicon Solar Cells: Final Subcontract Report, 1 April 2002–28 February 2006.**](#) July 2006; 73 pp. Work performed by BP Solar, Frederick, Maryland. NREL/SR-520-40191.

Wronski, C.R.; Collins, R.W.; Podraza, N.J.; Vlahos, V.; Pearce, J.M.; Deng, J.; Albert, M.; Ferreira, G.M.; Chen, C. [**Optimization of Phase-Engineered a-Si:H-Based Multi-Junction Solar Cells: Final Technical Report, October 2001–July 2005.**](#) August 2006; 82 pp. Work performed by Pennsylvania State University, University Park, Pennsylvania. NREL/SR-520-40400.

Yue, G.; Yan, B.; Ganguly, G.; Yang, J.; Guha, S.; Teplin, C.W. **Material Structure and Metastability of Hydrogenated Nanocrystalline Silicon Solar Cells.** Article No. 263507. *Applied Physics Letters.* 2006 ; 88(26): 3 pp.

Solar Energy—Radiation

Myers, D.R. **Cloudy Sky Version of Bird's Broadband Clear Sky Model.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Myers, D.R. **Necessity and Economics of Solar Radiation Resource Assessment.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Perez, R.; Kmiecik, M.; Wilcox, S.; Stackhouse, P.W.Jr. **Deriving Long Term High Resolution Solar Irradiances from Low Resolution Archives via Microstructure Patterning.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Reda, I.; Hickey, J.R.; Grobner, J.; Andreas, A.; Stoffel, T. **Calibrating Pyrgeometers Outdoors Independent from the Reference Value of the Atmospheric Longwave Irradiance.** *Journal of Atmospheric and Solar-Terrestrial Physics*. August 2006; 68(12): pp. 1416-1424.

Wilcox, S.; Anderberg, M.; Beckman, W.; DeGaetano, A.; George, R.; Gueymard, C.; Marion, W.; Myers, D.; Perez, R.; Lott, N.; Renne, D.; Stackhouse, P.; Vignola, F. **Towards Production of an Updated National Solar Radiation Database.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Solar Energy—Thermal

[**Cooling for Parabolic Trough Power Plants: Overview \(Presentation\).**](#) February 2006; 5 pp. Prepared for the 2006 Parabolic Trough Technology Workshop, 14-16 February 2006, Incline Village, Nevada. NREL/PR-550-40025.

[**Parabolic Trough Solar Thermal Electric Power Plants.**](#) July 2006; 2 pp. DOE/GO-102006-2339.

Canada, S.; Brosseau, D.A.; Price, H. **Design and Construction of the APS 1-MWe Parabolic Trough Power Plant.** Paper No. ISEC2006-99139. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado.* Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 8 pp.

Hurt, R.; Yim, W.; Boehm, R.; Hale, M.J.; Gee, R. **Advanced Parabolic Trough Field Testing — Real Time Data Collection, Archiving, and Analysis for the Solargenix Advanced Parabolic Trough.** Paper No. ISEC2006-99078. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado.* Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 6 pp.

Kelly, B. [**Nexant Parabolic Trough Solar Power Plant Systems Analysis; Task 1: Preferred Plant Size, 20 January 2005 – 31 December 2005.**](#) July 2006; 59 pp. Work performed by Nexant, Inc., San Francisco, California. NREL/SR-550-40162.

Kelly, B. [**Nexant Parabolic Trough Solar Power Plant Systems Analysis; Task 2: Comparison of Wet and Dry Rankine Cycle Heat Rejection, 20 January 2005–31 December 2005.**](#) July 2006; 27 pp. Work performed by Nexant, Inc., San Francisco, California. NREL/SR-550-40163.

Kelly, B. [**Nexant Parabolic Trough Solar Power Plant Systems Analysis; Task 3: Multiple Plants at a Common Location, 20 January 2005–31 December 2005.**](#) July 2006; 32 pp. Work performed by Nexant, Inc., San Francisco, California. NREL/SR-550-40164.

Kelly, B.; Kearney, D. [**Parabolic Trough Solar System Piping Model: Final Report, 13 May 2002–31 December 2004**](#). July 2006; 23 pp. Work performed by Nexant, Inc., San Francisco, California and Kearney & Associates, Vashon, Washington. NREL/SR-550-40165.

Kelly, B.; Kearney, D. [**Thermal Storage Commercial Plant Design Study for a 2-Tank Indirect Molten Salt System: Final Report, 13 May 2002–31 December 2004**](#). July 2006; 32 pp. Work performed by Nexant, Inc., San Francisco, California and Kearney & Associates, Vashon, Washington. NREL/SR-550-40166.

Kolb, G.J.; Hassani, V. **Performance Analysis of Thermocline Energy Storage Proposed for the 1 MW Saguaro Solar Trough Plant**. Paper no. ISEC2006-99005. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado*. Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 5 pp.

Kutscher, C.; Buys, A.; Gladden, C. [**Hybrid Wet/Dry Cooling for Power Plants \(Presentation\)**](#). February 2006; 44 pp. Prepared for the 2006 Parabolic Trough Technology Workshop, 14-16 February 2006, Incline Village, Nevada. NREL/PR-550-40026.

Lewandowski, A.; Feik, C.; Hansen, R.; Phillips, S.; Bingham, C.; Netter, J.; Forristal, R.; Burkholder, F.; Meglan, B.; Wolfrum, E. [**Trough Receiver Heat Loss Testing \(Presentation\)**](#). February 2006; 15 pp. Prepared for the 2006 Parabolic Trough Technology Workshop, 14-16 February 2006, Incline Village, Nevada. NREL/PR-550-40023.

Marcotte, P.; May, K.; Forristall, R. **Development of the Focal Point Power Trough (FPPT): An Advanced Parabolic Trough Concentrator for Electricity Generation**. Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 6 pp.

Price, H.; Forristall, R.; Wendelin, T.; Lewandowski, A.; Moss, T.; Gummo, C. **Field Survey of Parabolic Trough Receiver Thermal Performance.** Paper No. ISEC2006-99167. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado*. Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 8 pp. For preprint version see [NREL/CP-550-39459](#).

Stone, K.W.; Garboushian, V.; Hurt, R.; Gray, A.; Boehm, R.; Fletcher, T.; Hale, M.J. **Operation and Performance of the Amonix High Concentration Photovoltaic System at the University of Nevada, Las Vegas during the Second Year of Operation.** Paper No. ISEC2006-99076. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado*. Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 8 pp.

Wendelin, T. [**Parabolic Trough VSHOT Optical Characterization in 2005-2006 \(Presentation\)**](#). February 2006; 32 pp. Prepared for the 2006 Parabolic Trough Technology Workshop, 14-16 February 2006, Incline Village, Nevada. NREL/PR-550-40024.

Wendelin, T.; May, K.; Gee, R. **Video Scanning Hartmann Optical Testing of State-of-the-Art Parabolic Trough Concentrators.** Paper No. ISEC2006-99172. Morehouse, J.H. and Krarti, M., eds. *Solar Engineering 2006: Proceedings of the ASME 2006 International Solar Energy Conference (ISEC2006), 9-13 July 2006, Denver, Colorado*. Included as part of Solar 2006 (CD-ROM) containing Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. New York: American Society of Mechanical Engineers (ASME) and Boulder, CO: American Solar Energy Society (ASES), 2006; 9 pp. For preprint version see [NREL/CP-550-39590](#).

Transportation

[**Assessment of the O2Diesel Operational Safety Program: December 23, 2002 — June 30, 2007.**](#) June 2006; 70 pp.
Work performed by TIAX LLC, Cupertino, California for O2Diesel, Inc., Newark, Delaware. NREL/SR-540-39720.

[**Clean Cities Now, Vol. 10, No. 2.**](#) Official Publication of Clean Cities and the Alternative Fuels Data Center (Newsletter).
May 2006; 9 pp. DOE/GO-102006-2304.

[**Clean Cities Now, Vol. 10, No. 3.**](#) Official Publication of Clean Cities and the Alternative Fuels Data Center (Newsletter).
July 2006; 7 pp. DOE/GO-102006-2327.

[**EPAct and Clean Cities: What's the Connection? Fleet Requirements and Regulations \(Fact Sheet\).**](#) September 2006; 2 pp.
DOE/GO-102006-2330.

[**Handbook for Handling, Storing, and Dispensing E85.**](#) Energy Efficiency and Renewable Energy (EERE) Clean Cities (Brochure).
July 2006; 31 pp. DOE/GO-102006-2343.

[**What is Clean Cities?**](#) Clean Cities Fact Sheet. July 2006; 4 pp. DOE/GO-102006-2341.

Barnitt, R. [**Case Study: Ebus Hybrid Electric Buses and Trolleys.**](#) July 2006; 50 pp. NREL/TP-540-38749.

Havey, C.D.; McCormick, R.L.; Hayes, R.R.; Dane, A.J.; Voorhees, K.J. [**Analysis of Nitro-Polycyclic Aromatic Hydrocarbons in Conventional Diesel and Fischer-Tropsch Diesel Fuel Emissions Using Electron Monochromator-Mass Spectrometry.**](#)
Analytical Chemistry. 15 July 2006; 78(14): pp. 4894-4900.

Hayes, R.R.; Williams, A.; Ireland, J.; Walkowicz, K. [**King County Metro Transit: Allison Hybrid Electric Transit Bus Laboratory Testing.**](#) September 2006; 29 pp. NREL/TP-540-39996.

Lough, G.C.; Schauer, J.J.; Lawson, D.R. [**Day-of-Week Trends in Carbonaceous Aerosol Composition in the Urban Atmosphere.**](#)
Atmospheric Environment. 2006; 40: pp. 4137-4149.

Markel, T. [**Plug-In Hybrid Electric Vehicles \(Presentation\).**](#) May 2006; 19 pp. Prepared for the Clean Cities Congress and Expo,
7-10 May 2006, Phoenix, Arizona. NREL/PR-540-40239.

Markel, T.; Simpson, A. [**Plug-in Hybrid Electric Vehicle Energy Storage System Design \(Presentation\)**](#). May 2006; 13 pp.
Prepared for the Advanced Automotive Battery Conference, 17-19 May 2006, Baltimore, Maryland. NREL/PR-540-40237.

McCormick, R.L.; Alleman, T.L.; Westbrook, S.; Waynick, J.A.; Porter, S. [**Oxidation Stability of Biodiesel and Biodiesel Blends \(Presentation\)**](#). June 2006; 27 pp. Prepared for the ASTM, June 2006, Toronto, Canada. NREL/PR-540-40356.

Putsche, V. [**Strategies for Decreasing Petroleum Consumption in the Federal Fleet \(Presentation\)**](#). June 2006; 23 pp.
Prepared for the Fed Fleet 2006 Conference, 19-22 June 2006, Los Angeles, California. NREL/PR-540-40157.

Wind Energy

Low Wind Speed Technology Phase II: Design and Demonstration of On-Site Fabrication of Fluted-Steel Towers Using LITS-Form™ Process. Wind Energy Program Technology Portfolio (Fact Sheet). June 2006; 1 p. DOE/GO-102006-2300.

Low Wind Speed Technology Phase II: LIDAR for Turbine Control. Wind Energy Program Technology Portfolio (Fact Sheet). June 2006; 1 p. DOE/GO-102006-2305.

Low Wind Speed Technology Phase II: Sweep-Twist Blade Design and Fabrication with Atmospheric Test Verification. Wind Energy Program Technology Portfolio (Fact Sheet). June 2006; 1 p. DOE/GO-102006-2323.

NAWIG News: The Quarterly Newsletter of the Native American Wind Interest Group; Summer 2006. June 2006; 4 pp. DOE/GO-102006-2289.

Bluestein, J.; Salerno, E.; Bird, L.; Vimmerstedt, L. **Incorporating Wind Generation in Cap and Trade Programs.** July 2006; 52 pp. NREL/TP-500-40006.

Elliott, D.; Schwartz, M. **Wind Resource Mapping for United States Offshore Areas.** June 2006; 1 p. Prepared for the Windpower 2006 Conference & Exhibition, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/PO-500-39971.

Elwasia, N.; Sundaresan, M.J.; Schulz, M.J.; Ghoshal, A.; Pai, P.F.; Tu, P.K.C. **Damage Bounding Structural Health Monitoring.** *Journal of Intelligent Material Systems and Structures*. July 2006; 17: pp. 629-648.

Flowers, L. **The Wind/Water Nexus (Poster).** June 2006; 1 p. Prepared for AWEA Windpower 2006, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/PO-500-39213. <http://www.nrel.gov/docs/fy06osti/39213.pdf>.

Forsyth, T.; Tombari, C.; Nelson, M. **Lessons Learned from the U.S. Photovoltaic Industry and Implications for Development of Distributed Small Wind: Preprint.** June 2006; 10 pp. To be presented at WindPower 2006, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/CP-500-40172.

Green, J. **225-kW Dynamometer for Testing Small Wind Turbine Components: Preprint.** June 2006; 10 pp. To be presented at the American Wind Energy Association's WindPower 2006 Conference, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/CP-500-40070.

Green, J. [Installer Issues: Integrating Distributed Wind into Local Communities \(Presentation\)](#). June 2006; 41 pp.
Prepared for the WindPower 2006 Conference & Exhibition, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/PR-500-40096.

Hand, M.M.; Robinson, M.C.; Balas, M.J. **Wind Turbine Response to Parameter Variation of Analytic Inflow Vortices**.
Wind Energy. 2006; 9: pp. 267-280.

Huskey, A. [International Electrotechnical Commission Standard IEC 61400-11 and Other Procedures: Acoustic Noise Measurement Techniques \(Presentation\)](#). June 2006; 13 pp. Prepared for the WindPower 2006 Conference & Exhibition, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/PR-500-39978.

Jonkman, B.J.; Buhl, M.L.Jr. [TurbSim User's Guide](#). September 2006; 32 pp. NREL/TP-500-39797.

Kelley, N.D.; Jonkman, B.J. [Overview of the TurbSim Stochastic Inflow Turbulence Simulator: Version 1.10](#). September 2006; 15 pp. NREL/TP-500-39796.

Lipo, T.A.; Tenca, P. [Design and Test of a Variable Speed Wind Turbine System Employing a Direct Drive Axial Flux Synchronization Generator: 29 October 2002–31 December 2005](#). July 2006; 56 pp. Work performed by University of Wisconsin, Madison, Wisconsin. NREL/SR-500-39715.

Milligan, M. [Tackling Climate Change in the United States: The Potential Contribution from Wind Power; Preprint](#). 2006; 9 pp.
To be presented at Solar 2006 Conference, 7-13 July 2006, Denver, Colorado. NREL/CP-500-40230.

Milligan, M.; Shiu, H.; Kirby, B.; Jackson, K. [Multi-Year Analysis of Renewable Energy Impacts in California: Results from the Renewable Portfolio Standards Integration Cost Analysis; Preprint](#). August 2006; 40 pp. Presented at WindPower 2006, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/CP-500-40058.

Parsons, B.; Milligan, M.; Smith, J.C.; DeMeo, E.; Oakleaf, B.; Wolf, K.; Schuerger, M.; Zavadil, R.; Ahlstrom, M.; Nakafuji, D.Y. [Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States; Preprint](#). July 2006; 16 pp. Presented at the European Wind Energy Conference (EWEC 2006), February 27–March 2, 2006, Athens, Greece. NREL/CP-500-39955.

Rhoads-Weaver, H.; Forsyth, T. [Overcoming Technical and Market Barriers for Distributed Wind Applications: Reaching the Mainstream; Preprint](#). July 2006; 9 pp. To be presented at the Solar 2006 Conference, 7-13 July 2006, Denver, Colorado. NREL/CP-500-39858.

Rhoads-Weaver, H.; Forsyth, T. **Overcoming Technical and Market Barriers for Distributed Wind Applications: Reaching the Mainstream.** Campbell-Howe, R., ed. *Proceedings of the Solar 2006 Conference, 9-13 July 2006, Denver, Colorado (CD-ROM)*. Including Proceedings of 35th ASES Annual Conference, Proceedings of 31st National Passive Solar Conference, Proceedings of the 1st Renewable Energy Policy and Marketing Conference, and Proceedings of the ASME 2006 International Solar Energy Conference. Boulder, CO: American Solar Energy Society (ASES) and New York: American Society of Mechanical Engineers (ASME), 2006; 7 pp. For preprint version see [NREL/CP-500-39858](#).

Schulz, M.J.; Sundaresan, M.J. [Smart Sensor System for Structural Condition Monitoring of Wind Turbines: 30 May 2002 – 30 April 2006](#), August 2006; 53 pp. Work performed by University of Cincinnati, Cincinnati, Ohio and North Carolina A&T State University, Greensboro, North Carolina. NREL/SR-500-40089.

Thresher, R. [Vision for High Volume Wind Energy Markets \(Presentation\)](#), June 2006; 7 pp. Prepared for the WindPower 2006 Conference & Exhibition, 4-7 June 2006, Pittsburgh, Pennsylvania. NREL/PR-500-40101.