MICHAEL D. MANN
Distinguished Professor of Chemical Engineering
Executive Director, Institute for Energy Studies
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EDUCATION AND PROFESSIONAL EXPERIENCE

Education

1997 Ph.D., Energy Engineering, University of North Dakota
1988 M.B.A., University of North Dakota
1981 M.S., Chemical Engineering, University of North Dakota
1979 B.A., Chemistry and Mathematics, Mayville State College

Professional Experience

2014-Present Executive Director, Institute for Energy Studies, UND
2013-2014 Associate Dean, College of Engineering and Mines, UND
2009-2013 Associate Dean for Research, School of Engineering and Mines, UND
2008 Interim Dean, School of Engineering and Mines, UND (Apr – Aug)
2006-Present Distinguished Professor, Chemical Engineering, UND
2005-2013 Chair, Chemical Engineering, UND
1991-2006 Associate Professor, Chemical Engineering
2000-2005 Director, Engineering Doctoral Program
1999 Lecturer, Chemical Engineering, UND
1999-2005 Senior Research Advisor, Energy & Environmental Research Center
1994-1999 Senior Research Manager, Advanced Processes and Technologies
1985-1994 Research Manager, Combustion Systems, EERC, UND, 1985 – 1994.
1982-1985 Research Engineer, Wastewater Treatment and Reuse, EERC, UND
1981-1982 Operating Contractor, EG&G, Grand Forks Energy Technology Center (GFETC)

Executive Director, Institute for Energy Studies: The goal of the Institute for Energy Studies is for UND to become a premier "Energy University" that "inspires the creation of new knowledge that enables the development of revolutionary energy technologies, trains the next generation of energy experts, and establishes advanced industries required to make affordable emissions free energy technologies a reality". As the executive director of the Institute, in addition his overall management duties, Dr. Mann's responsibilities include identifying key technical and economic barriers to the development of secure, affordable, and reliable energy production technologies; identifies proposal opportunities and develops new relationships with potential partners; and draws from resources across the UND campus building teams to deliver the research, education, and/or public outreach required to meet the needs of these public and private partners.

Associate Dean, College of Engineering and Mines: The Associate Dean provides advice and support to the Dean in issues related to academic affairs. In this role, Dr. Mann is expected to help the Dean monitor the academic procedures and policies of the college, participate in curricular matters including the development of new programs of study, and provide support to the academic units for accreditation processes and reports. The Associate Dean also provides advice and support in issue related to research and development. Dr. Mann is expected to help

the Dean implement the college's major research goals and initiatives stated in Vision Building Block 3 in the strategic plan, promote a culture of research in the college, enhance research opportunities for faculty and students, and provide administrative oversight for proposal submittal and grant accounting.

Associate Dean for Research, School of Engineering and Mines: The School of Engineering and Mines (SEM) established a new vision for research during its 2008 strategic planning: "*We will be internationally recognized for excellence in research fostering discovery, serving societal needs, and stimulating technology transfer".* A major cornerstone of this plan is the expansion of SEM's current energy research portfolio into an internationally recognized signature program. As Associate Dean for Research, Michael Mann is responsible for implementing this research agenda.

Interim Dean, School of Engineering and Mines: As Interim Dean, Michael Mann was responsible for all academic and research activities within SEM. In this role he expanded his leadership experience and broadened his overview of the campus wide talents and opportunities for enhancing UND's reputation as a leader in energy research and education.

Department of Chemical Engineering: Michael Mann has quickly developed a reputation as a engaging teacher, excellent researcher, and inspirational leader. He has been awarded UND's highest honor, the Chester Fritz Distinguished Professorship in 2009 in recognition for his accomplishments in research, teaching, and service. He has also been awarded UND's highest award for Excellence in Research in 2006, and has led the Department of Chemical Engineering to UND's top departmental awards for Excellence in Research in 2005 and 2011 and Excellence in Teaching in 2007. He is a co-founder of the SUstainable eNergy Research, Infrastructure, and Supporting Education (SUNRISE) group in 2004. SUNRISE now has over 30 faculty participants from 12 different departments and 4 North Dakota Universities with over $20 million in research grants. His current research specialties include performance and system integration issues in advanced energy systems; renewable and sustainable energy systems with a focus on integration of fuel cells with renewable resources; production of fuel and specialty chemicals from crop oils; and development of energy strategies coupling thermodynamics with political, social, and economic factors.

Energy & Environmental Research Center: Michael Mann's activities evolved from hands on research to the development and marketing of ideas and technology. He has been involved in a wide range of technology development, including energy production from combustion and gaisficaiton, wind, and geothermal resources. Much of his activity was focused on system integration and life-cycle effects. Highlights of his career at EERC include management of over $15 million in research projects; design, installation, and operation of a 1 MW_{th} CFBC; design, installation, and operation of a 250 lb/hr gasifier; manager for project for the development of small power systems for Alaskan villages; and the development of a small-modular fluid-bed combustion system (0.5 to 5 MW)

COURSES DEVELOPED AND TAUGHT

Undergraduate Level

ChE 102 Intro to Chemical Engineering
ChE 332 Chemical Eng. Laboratory III
ChE 301 Intro to Transport Phenomena
ChE 397 Chemical Engineering Cooperative Education
ChE 411 Chemical Eng. Plant Design (assisted)

ChE 412 Chemical Eng. Plant Design (assisted)
ChE 403 Chemical Engineering Thermodynamics
ChE 404 Air Emissions and Regulation
ChE 431 Chemical Engineering Lab IV (assisted)
ChE 493A DEDP Lab II
Engr 460 Engineering Economy

Graduate Level

ChE 562 Chemical Engineering Seminar
ChE 503 Fuels Technology
ChE 504 Air Pollution Control
ChE 509 Adv. Chemical Engr. Thermodynamics
EnE 501 Energy Resources and Policy
Engr 502 Alternative Energy Systems
EnE 562 Energy Engineering Seminar
EnE 590 Special Topics: Energy Systems Design

RESEARCH AND PUBLICAITONS

Specialty

Multidisciplinary and integrated energy and environmental projects including the development of energy strategies and the selection of optimum utilization processes emphasizing renewable energy and clean coal technologies. He is involved in the development of multidisciplinary and integrated energy and environmental projects emphasizing a cradle-to-grave approach, i.e., development of energy strategies based on thermodynamics and economics; selection of optimum utilization processes emphasizing renewable energy and clean coal technologies, integration of effluent treatment, and emission controls.

Research Advisees

Ph.D. Students

- Eduardo Hernandez Pacheo, “Electro-Thermal Model for a Solid Oxide Fuel Cell”, 2004, Intel
- Yongxin Zhao , “Oxidation of Mercury for Control in a Wet Scrubber” 2005, ARCADIS
- Shankar Karki, “Impact of Electric Utility Deregulation in Developing Countries”, 2006, Electric Power Research Institute
- Kevin Harrison, “Modelling, Integration and Control of Proton Exchange Membrane Electrolyzer for Wind Based Renewable Energy Applications” 2006 (co-advised with Hossein Salehfar), National Renewable Energy Laboratory
- Rhonda Hill, “A Dynamic Model of a Fixed Speed Stall Control Wind Turbine Connected to a Weak Distribution Grid” 2007 (co-advised with Hossein Salehfar), Clipper Wind Energy
- Gopal Bandyopdahyay, “Development of Optimization Models of Renewable Energy Based Space Conditioning Systems”, 2008, Pacific Northwest National Laboratory
- Nilesh Dale, “Characterization of PEM Electrolyzer and PEM Fuel Cell Stacks using Electrochemical Impedance Spectroscopy”, May 2009, Nissan Technical Center
- Christian Biaku, “Large Scale Integration of Electrochemical Devices with Electrical Distribution Networks”, 2009, Nucor Steel Birmingham (co-advise with Hossein Salehfar)
- Phillip Hutton, “Modeling Competitive Adsorption of SO_3 from Flue Gas for In-Duct Injection of Hydrated Lime”, 2009, Energy & Environmental Research Center

- TaeHee Han, “Simulation, Design, and Control of Stand Alone Integrated Wind-Hydrogen Power Systems in Residential Applications” December 2010. (co-advise with Hossein Salehfar), Nissan Technical Center
- Bhanuaben Patel, “Development of Two-Wheeled Fuel Cell Vehicles”, May 2011
- Ryan Knutson, “CFD Modeling of Hydrogen Production from Coal via Ultra Superheated Steam (USS) Fluidized Bed Gasification” August 2011, Uhde Corporation of America
- Kirtipal Barse, “Modeling of Organic Rankine Cycle Engines for Low Temperature Geothermal Applications”, May 2014, UND Institute for Energy Studies
- Samir Dahal, “Optimal Allocation of Distributed Renewable Energy Sources in Power Distribution Networks”, August 2014. (co-advise with Hossein Salehfar), Mitsubishi Electric Power Products.
- Bjorgaard, Stacy, “Characterization and Catalytic Cracking of Tar Obtained in Coal / Biomass / Municipal Solid Waste Gasification: The Use Of Basic Mineral Catalysts and Miscibility, Properties, and Corrosivity of Petroleum-Biofuel Oils and Blends for Application in Oil-Fired Power Stations, August 2015, UND College of Engineering and Mines
- Jivan Thakare, “Development of Fuel Cell Membranes” August 2016.
- Daniel Laudal, “Evaluation of Rare Earth Element Extraction from North Dakota Coal-Related Feedstocks:
- Hannes van der Watt, “Development of Sorbent Materials for CO_2 Capture”, expected May 2019.
- Feilen, Harry, “Attrition Evaluation of Oxygen Carriers in Chemical Looping Systems” expected May 2019

Other PhD Committees (not chair) - 3 Chemical Engineering students, three Engineering, one Chemistry, one Education, and one Atmospheric Science student.

<u>Masters of Science:</u>

Jeremie Moberg, 2001, Intel; Jason Jacobson, 2001, Trane; Muhammad Amanullah, 2003, University of Minnesota-Duluth; Biplab Mukerjee, 2004, Washington University, St. Louis, Ph.D. program; Kyle Martin, 2004, EERC; Devinder Singh, 2005, Kansas State University, Ph. D. program; Devdutt Shukla, 2005, University of Missouri-Rolla, Ph.D. program; Srinivas Koli, 2005, University of Kentucky, Ph.D program; Joshua Strege, 2005, EERC; Carol Horabik, 2006, University of Minnesota-Duluth; Xi Hong, 2006, Michigan Tech, Ph.D. program; Prasana Sardenia, 2006, Microbeam Technologies; Christopher Kinchin, 2006, National Renewable Energy Laboratory, Prasad Chavan, 2007, Hutchinson Technologies; Taskin Karim, 2007, University of Texas; Marika Nel, 2007, Northwest University, South Africa; Mohammed Hussain, 2007, Kansas State University PhD program; Jason Hrdlicka, 2007, National Renewable Energy Laboratory; Rahul Pandry, 2008, private company in India; Taskin Karim, 2010, University of Houston; Shankar Lande, 2011; Sam Cowart, 2012, West Point Military Academy; Kirt Leadbetter, May 2014; Chris Haugen, 2015, Hess Corporation.

Current Students: Kristopher Keller, Zach Young, Grace Ricker, Adam Svercl, Irina Tsiyapkina, and Shabaz Kahn

Other Graduate Committees (not chair) - over 25 MS Chemical/Environmental Engineering students, four Mechanical Engineering, one Chemistry, and one Earth Systems and Policy student.

External Examiner:

Mohammad Reza Parsa, “Investigation of Spontaneous Combustion Behavior of Brown Coal and the Effect of Densification Process”, PhD candidate at Monash Research Graduate School, Clayton, Victoria, Australia, 2016.

Vindor Kumar Yadav, “Simulation of Single Char Particle Gasification in Conditions of a Coal Gasifier”, PhD candidate at the Indian Institute of Technology Roorkee, Roorkee, India, April 2016.

Marika Nel, “The Influence of Coal-Associated Trace Elements on Sintering and Agglomeration of a Model Coal Mineral Mixture”, PhD candidate at North-West University, South Africa. January, 2010.

Emma Qi, “Dewatering Australian Lignite Using Mechanical Thermal Expression”, PhD candidate at Monash Research Graduate School, Clayton, Victoria, Australia. 2004.

Xuantian Li, “Biomass Gasification in a Circulating Fluidized Bed”, PhD candidate at the University of British Columbia, Vancouver, Canada. Defended September 11, 2002.

George Favis, “Hydrothermal Dewatering - Evaluation of a Non-Evaporative Drying Technique for the Lignite Power Industry”, PhD candidate at Monash Research Graduate School, Clayton, Victoria, Australia. Defended February 15, 2001.

Undergraduate Research: Sponsored 28 undergraduate students in a variety of research programs

Peer Reviewed Journal Articles – since 2005

- Chenguri Qu, Mo Zhang, and Michael Mann were co-authors on a paper entitled “Effect of Combustion Temperature on the Emission of Trace Elements under O_2/CO_2 Atmosphere during Coal Combustion”, IOP Conference Series Earth and Environmental Science, 2018.
- Feng Xiao, Alemayehu Bedane, Julia Zhao, Michael Mann, and Joseph Pignatello were co-authors on a paper entitled “Thermal Air Oxidation Changes Surface and Adsorptive Properties of Black Carbon (Char/Biochar)”, Science of the Total Environment, 2018.
- Johannes van der Watt, Daniel Laudal, Gautham Krishnamoorthy, Harry Feilen, Junior Nasah, Michael Mann, Ryder Shalbetter, Teagan Nelson, and Srivats Srinivasachar were co-authors on a paper entitled “Development of a Spouted Bed Reactor for Chemical Looping Combustion”, Journal of Energy Resources Technology, 2018.
- Will Gosnold, Michael Mann, and Hossein Salehfar were co-authors on a paper entitled “The UND-CLR Binary Geothermal Power Plant”, Transactions-Geothermal Research Council, 2017.
- K. Barse, M. D. Mann, “Maximizing ORC Performance with Optimal Match of Working Fluid with System Design””, *Applied Thermal Energy*, 2016.
- W. Gosnold, A. Crowell, S. Nordeng, M. Mann, “Co-Produced and Low-Temperature Geothermal Resources in the Williston Basin”, *Transactions-Geothermal Resources Council”* 2015.
- Gosnold, W., R. Lefever, M. Mann, R. Klenner, H. Salehfar, "EGS Potential in the Northern Midcontinent of North America," Transactions of the Geothermal Resources Council, 6 pp. Oct. 2010.
- Gosnold, Will; Mann, Michael; Salehfar, Hossein; Geothermal Power from Coproduced Fluids in the Williston Basin, Transactions of the Geothermal Resources Council, 6 pp. Oct. 2010.

- Fix, G; Seames, W.; Sisk, D.; Miller, D.; Benson, S.; Mann, M.; "Studies of Coal-Ash Fine Fragmentation Mode Formation Mechanisms During Combustion"; Fuel Processing and Technology, 2010
- Dale, N.N.; Mann, M.D.; Salehfar, H.; Dhirde, A.M.; Han, T.; "ac Impedance Study of a Proton Exchange Membrane Fuel Cell Under Various Loading Conditions", Journal of Fuel Cell Science and Technology, 7 (2010) 031010.
- Peters, R.R.; Muthumuni, D; Bartel, T.; Salehfar, H.; Mann, M.D.; „Static VAR Compensation of a Fixed Speed Stall Control Wind Turbine during Start-up" Electric Power Systems Research, 80 (2010), 400-405.
- C.Y. Biaku, N.V. Dale, M.D. Mann, H. Salehfar, A.J. Peters, T. Han; "A semiempirical study of the temperature dependence of the anode charge transfer coefficient of a 6 kW PEM electrolyzer" International Journal of Hydrogen, 22 (2008) 4247-4254
- A. M. Dhirde; N. V. Dale; H. Salehfar; M. D. Mann; T. Han; "Equivalent Electric Circuit Modeling and Performance Analysis of a PEM Fuel Cell Stack Using Impedance Spectroscopy" IEEE PES Transactions on Energy Conversion, TEC-00258-2009.
- Dale, N.V.; Mann, M.D.; Salehfar, H.; "Semiemperical model based on thermodynamic principles for determining 6 kw proton exchange membrane electrolyzer characteristics" *Journal of Power Sources*, 2008, 185, pp. 1348-1353.
- Hrdlicka, J.A., Seames, W.S., Mann, M.D., Muggli, D.S., and Horabik, C.A., "Mercury oxidation in flue gas using gold and palladium catalysts on fabric filters", *Engineering Science and Technology*, (2008), 42 (17), pp. 6677-6682.
- Biaku, C.Y.; Dale, N.V.; Mann, M.D.; Salehfar, H.; Peters, A.J.; Han, T.; "A semi-empirical study of the temperature dependence of the anode charge transfer coefficient of a 6 kw PEM electrolyzer", *International Journal of Hydrogen Energy*, 2008, 33 (16), pp. 4247-4254.
- Sadrameli, S.M.; Seames, W.; Mann, M.; "Prediction of higher heating values for saturated fatty acids from their physical properties", *Fuel* (2008), 87 (10-11), pp. 1776-1780.
- Peters, R.R.; Muthumumi, D.; Bartel, T.; Salehfar, H.; Mann, M.D.; "Static VAR Compensation of a Fixed-Speed Stall Control Wind Turbine at Start-UP, IEEE Transactions, PES #1709603.
- Harrison, K., Pacheco, E.H., Mann, M.D., and Salehfar, H.; "Semi-Empirical Model for Determining PEM Electrolyzer Stack Characteristics", *Journal of Fuel Cell Science and Technology*, 2006, 3(2) 220-223.
- Karki, S., Mann, M.; Salehfar, H.; "Substitution and Price Effects of Carbon Tax on CO_2 Emission Reduction from Distributed Energy Sources", *Asian Journal of Energy & Environment"*
- Karki, S; Kulkarni, M.; Mann, M.D.; Salehfar, H.; "Efficiency Improvements through Combined Heat and Power for On-Site Distributed Generation Technologies", *Cogeneration and Distributed Generation Journal*, Vol 22, No 3, 2007, pp 19-34.
- Bandapodyay, G.; Mann, M.D., Kulkarni, M.; "A New Approach to the Modeling of the Ground Heat Exchangers in the Initial Phase of Heat Flux Build-up" – ASHRAE TRNS-00124, 2007.
- Bandyopahdyay, G.; Bagheri, F.M.; Mann, M.D.; "Reduction of Fossil Fuel Emission in US: A Holistic Approach Towards Policy Formulation" , *Energy Policy*; 2007, 35 (2) 950-965.
- Bandapodyay, G.; Gosnold, W.; Mann, M.D., "Analytical and Semi-Analytical Solutions for Short Time Temperature Response of Ground Heat Exchangers", *Energy & Buildings*, 2008; 40: 1816-1824.
- Dale, N.V.; Harrison, K.W.; Han, T.; Mann, M.D.; Salehfar, H.; Dhirde, A.M.; "Hydrogen Dew Point Control in Renewable Energy Systems using Thermoelectric Coolers", 2008 IEEE Transactions #4596026
- Hernandez-Pacheco, E.; Mann, M.; "A computer model for a high temperature fuel cell", *Revista Mexicana de Fisica E*, 2006, 52 (2), pp. 119-125.

- Peters, R.R.; Stevens, B.; Mann, M.D.; Salehfar, H.; Peters, A.J.; Han, T.: "Dynamic Scheduling of Wind Energy for Hydrogen Production by Electrolysis", 2006, IEEE Transactions #1709552.
- Hernandez-Pacheco, E; Singh, D; Hutton, P.N.; Patel, N; Mann, M.D.; "A macro-level model for determining the performance characteristics of solid oxide fuel cells", *Journal of Power Sources*, 2004, 138: 174-186.
- Zhao, Y., Mann, M.D, Pavlish, J.P., Mibeck, B.A.F.; Dunham, G.E.; Olson, E.W.; "Application of Gold Catalyst for Mercury Oxidation by Chlorine", *Environmental Science and Technology*; 2006 40: 1603.

Patents

- Patent 60/642,678 with Seames and D.S. Muggli, "Mercury Oxidation of Flue Gas using Catalytic Barrier Filters", 2009.

National/International Presentations with Papers –since 2005

- Michael Mann, Daniel Laudal, and Steve Benson, "Maintaining Coal's Prominence in a Carbon Constrained World", Keynote presentation at the 2017 International Conference of Coal Science & Technology, Sept 2017.
- Abdullah Al Hadi, Nayeem Chowdhury, and Michael Mann,"Design and Analysis of a Standalone DC Microgrid with Battery and Fuel Cell Energy Storage Penetration for Different Load Characteristic", 2018 IEEE International Conference on Power Energy, Environment and Intelligent Control, April 2018.
- Johannes van der Watt, Ben Jensen, Daniel Laudal, Harry Feilen, Junior Nasah, Michael Mann, Ryder Shalbetter, Gautham Krishnamoorthy, and Srivats Srinivasachar, "Evaluation of a Spouted Bed Reactor for Chemical-Looping-Combustion of Solid Fuels"; 43rd International Technical Conference on Clean Energy, May 2018.
- Johannes van der Watt, Daniel Laudal, Harry Feilen, Michael Mann, Srivats Srinivasachar, Teagan Nelson and Steve Benson, "Reactive Jet Attrition Analysis of Oxygen Carriers in Chemical-Looping-Combustion Systems", 43rd International Technical Conference on Clean Energy, May 2018.
- Johannes van der Watt, Daniel Laudal, Harry Feilen, Michael Mann, Srivats Srinivasachar, Teagan Nelson, "Attrition and Reactivity Analysis of Oxygen Carrier Materials under High Temperature Conditions", 2017 International Pittsburgh Coal Conference, Sept 2017.
- Daniel Laudal, Brittany Rew, Steve Benson and Michael Mann, "Technical and Economic Feasibility Analysis of Integrating Activated Carbon with Heating Plant", 2017 International Pittsburgh Coal Conference, Sept 2017
- Will Gosnold, Hossein Salehfar and Michael Mann,"Challenges in Implementing a Multi-Partnership Geothermal Power Plant" SEDHeat Workshop, Oct 2016.
- Will Gosnold, Michael Mann and Hossein Salehfar, "The UND-CLR Binary Geothermal Power Plant", AAPC Pacific and Rocky Mountain Joint Meeting, Oct 2016.
- Gosnold, W.; Lefever, R.; Mann, M.; *Klenner, R*.; Salehfar, H.; " EGS Potential in the Northern Midcontinent of North America" Geothermal Research Council Annual Mtg. Oct. 2010 [*Received a best paper award*]
- Blekhman, D., J. Keith, A. Sleiti, E. Cashman, P. Lehman, R. Engel, M. Mann, and H. Salehfar, 2010, "National Hydrogen and Fuel Cell Education Program Part I: Curriculum," ASEE Annual Conference & Exposition, Louisville, KY. [*Received a best paper award*]
- Blekhman, D., J. Keith, A. Sleiti, E. Cashman, P. Lehman, R. Engel, M. Mann, and H. Salehfar, 2010, "National Hydrogen and Fuel Cell Education Program Part II: Laboratory Practicum," ASEE Annual Conference & Exposition, Louisville, KY.
- *Goldade, J., T. Haagenson*, H. Salehfar, and M. Mann, 2010, "Design of A Laboratory

Experiment to Measure Fuel Cell Stack Efficiency and Load Response," ASEE Annual Conference & Exposition, Louisville, KY.

- *Barse, K.,* Mann, M., Gosnold, W., Salehfar, H., "Evaluation of technical and economic feasibility of ORC to generate electricity using low geothermal resource", ND EPSCoR Conference, Grand Forks, September 29, 2010
- *Dahal, S.;* Salehfar, H.; Gosnold, W.; Mann, M.; "Modeling and Simulation of the Interface between Geothermal Power Plant Based on Organic Rankine Cycle and the Electric Grid," GRC Ann Mtg. Oct. 2010
- Gosnold, W.; Mann, M.; Salehfar, H.; "Geothermal Power From Coproduced Fluids in the Williston Basin", GRC Ann Mtg. Oct. 2010
- W. Gosnold, R. Lefever, M. Mann, *R. Klenner, M. McDonald*, and H. Salehfar, "EGS Potential in the Northern Midcontinent of North America", AAPG/SPE/SEG Hedberg Conference: Enhanced Geothermal Systems; March 14-18, 2011 – Napa, California
- *K. A. Barse;* M. D. Mann; W.D. Gosnold; H. Salehfar, "Feasibility of geothermal power from low temperature resources including the effect of working fluid on Organic Rankine Cycle efficiency" presented at the 2011 Energy, Utility & Environment Conference, Jan 31-Feb 2, 2011, Phoenix, AZ.
- *R. Knutson*, M. Mann, D. Bayless, F. M. Lewis, *T. Karim*, "CFD Modeling of Hydrogen Production from Coal via Lewis Ultra-Superheated Steam (USS) Fluidized Bed Gasification" presented at the 2011 Clearwater Clean Coal Conference, Clearwater, Florida, June 6-8, 2011.
- Hussain, M.; Mann, M.D.; Swanson, M.L.; Musich, M.; "Testing of Lithium Silicate and Hydrotalcite as Sorbents for CO_2 Removal from Coal Gasifiction", *in* Proceedings of the 24th Annual International Pittsburgh Coal Conference, Johannesburg, South Africa, September, 2007.
- Seames, W.S.; Hrdlicak, J.; Mann, M.D.; Horabik, C.; Muggli, D.; "Bench-Scale Testing of Mercury Oxidation Catalysis on Barrier Filters", *in* Proceedings of the 24th Annual International Pittsburgh Coal Conference, Johannesburg, South Africa, September, 2007.
- Nel, M.V.; Mann, M.D.; Folkedahl, B.; Timpe, R.; "Comparison of Sodium Chloride Removal Abilities of Kaolin Clay and Calcined Bauxite as Possible Sorbents for Gasification", *in* Proceedings of the 24th Annual International Pittsburgh Coal Conference, Johannesburg, South Africa, September, 2007.
- Nel, M.V.; Mann, M.D.; Swanson, M.L.; Folkedahl, B.C., Henderson, A.K.; "Initial Speciation and in-bed Capturing of Alkali Species during Lignite Gasification", 2007 International Conference on Coal Science and Technology, Nottingham, England, to be presented August 2007.
- Peters, R.R.; Muthumuni, D.; Bartel, T.; Salehfar, H.; Mann, M.; "Dynamic Model Development of a Fixed Stall control Wind Turbine as Start-Up", Published in Proceedings of 2006 Power Engineering Society General Meeting, June 18-22, 2006, Montreal, Canada.
- A. J. Peters, N.V.Dale, C.Y. Biaku, K.W. Harrison, Dr. M.D.Mann and Dr. H. Salehfar, "Addressing System Integration Issues Required For the Development of a Distributed Wind-Hydrogen Energy System" , AWEA WINDPOWER Conference, Pittsburg, PA. May 2006 (Poster also)
- N.V.Dale, C.Y. Biaku, M.D. Mann, H.Salehfar, A.J. Peters, "Electrochemical Compression Of Product Hydrogen From PEM Electrolyzer Stack", NHA Annual Hydrogen Conference, San Antonio, March 2007 (Poster also)
- N.V.Dale, C.Y. Biaku, M.D. Mann, H.Salehfar, A.J. Peters, "PEM Electrolysis Hydrogen Production System Design For Improved Testing And Optimization", NHA Annual Hydrogen Conference, San Antonio, March 2007 (Poster also)

- C.Y. Biaku, N.V.Dale, M.D. Mann, H.Salehfar, A.J. Peters, “Analysis of Impedance Data of a Partially Loaded 1.2 kW PEM Fuel Cell Stack”, NHA Annual Hydrogen Conference, San Antonio, March 2007
- N.V.Dale, C.Y. Biaku, M.D. Mann, H.Salehfar, A.J. Peters, T.Han. “Electrochemical compression of hydrogen from renewable wind-PEM electrolysis generation systems”, AWEA WINDPOWER Conference, Los Angeles, June 2007 (Poster also)
- T.Han, C.Y.Biaku, N.V.Dale, H.Salehfar, M.D.Mann, “A Study of Low Pressure Fuzzy Logic Wind Hydrogen System for Off-Grid Applications” , AWEA WINDPOWER Conference, Los Angeles, June 2007 (Poster also)
- A.J. Peters, C.Y. Biaku, N.V.Dale, H.Salehfar, M.D.Mann, “Power Electronics for Interfacing of Wind Turbine and Electrolyzer for Hydrogen Generation” , AWEA WINDPOWER Conference, Los Angeles, June 2007 (Poster also)
- N.V.Dale, M.D.Mann, H.Salehfar, T.Han, A.M. Dhirde, “Modeling and Analysis of Electrochemical Hydrogen Compression”, NHA Annual Hydrogen Conference, Sacramento, CA, March 2008.(Poster also)
- A.M. Dhirde, H.Salehfar, M.D.Mann, N.V.Dale, T.Han, “ Developing circuit models of commercial PEM fuel cell using electrochemical impedance spectroscopy”, AWEA WINDPOWER Conference, Huston, TX, June 2008 (Poster also)
- T.Han, N.V.Dale, H.Salehfar. M.D.Mann, A.M. Dhirde, “Optimal Sizing of ultra-capacitors in integrated wind-hydrogen system using Fuzzy logic.”, AWEA WINDPOWER Conference, Huston, TX, June 2008 (Poster also)
- N.V.Dale, K.W. Harrison, T.Han, M.D. Mann, H.Salehfar, A.M. Dhirde, “ Hydrogen Dew Point Control in Renewable Energy Systems using Thermoelectric coolers”, IEEE PES Conference, Pittsburg, PA. July 2008

HONORS/AWARDS

- NSF Career Grant, 2001
- Olson Professorship for Excellence in Research, 2003
- Three papers selected as best papers in international conferences
- The Department of Chemical Engineering was the recipient of the 2005 and 2011 Fellows of the University Award of Excellence in Research
- UND Foundation Thomas J. Clifford Faculty Achievement Award for Individual Excellence in Research, 2006
- Who’s Who of Engineering Educators
- The Department of Chemical Engineering was the recipient of the 2007 and 2016 Fellows of the University Award of Excellence in Teaching
- Distinguished Alumni Award, Mayville State University, 2007
- Chester Fritz Distinguished Professor, University of North Dakota, 2009
- College of Engineering Outstanding Faculty Award, 2013
- Excellence in Undergraduate Recruitment and Advising, University of North Dakota. 2013