Jack Lewnard, Senior Technical Advisor

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 3 I Cambridge, MA 02139 I 617-453-7040
jlewnard@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Cambridge, MA. *Senior Technical Advisor*, 2026 – Present

- Provide expert testimony and advice to clients regarding gas system safety and technology, including pipe relining, repair, and preventative maintenance; alternative fuels such as hydrogen and biogas; and compressed gas and liquid natural gas.
- Advise other Synapse staff and experts regarding the impact of existing and potential gas technologies on the work they are leading for clients.

Independent Energy Consultant, 2025 – 2026

- Supporting government, companies, and start-ups on technical, intellectual property, and commercial issues.

Department of Energy Advanced Research Projects Agency-Energy (ARPA-E), Washington, DC. *Program Director*, 2019 – 2024

- Completed 5.5-year term as Program Director, which included managing ~75 projects ranging from $0.5–$7 million. Initiated or assumed responsibility for five programs:
    - REPAIR (Rapid Encapsulation of Pipelines Avoiding Intensive Replacement), 4-year $38 million program to deploy robots to rehabilitate pipes from the inside with novel coatings and create 3D maps of pipes from the inside and the surface.
    - REUSE (Recycle Underutilized Solids to Energy), 3-year $5 million exploratory program to develop technologies to convert high-energy materials currently going to landfills into a high-energy content liquid product.
    - REMEDY (Reducing Emissions of Methane Every Day of the Year) 3-year, $42 million program targeting 99.5 percent methane destruction for oil and gas flares and coal mine ventilation air, and less than 0.5 percent methane slip from lean-burn natural gas engines.
    - Assumed responsibility for the Methane pyrolysis cohort (9 teams funded through several awards). Multi-year $25 million program investigating thermal and thermal-catalytic processes focused on producing hydrogen and/or high-value carbon, upgrading carbon, and identifying new markets for carbon products.
    - Assumed responsibility for FLECCS (FLExible Carbon Capture and Storage) 4-year, $44 million program to develop carbon capture technologies that can match the dynamics of intermittently operating natural gas combined-cycle plants.

Chesapeake Utilities Corporation, Dover, DE. *Vice President Business Development*, 2013 – 2019

- Original member of start-up Corporate Strategic Growth Initiative. Responsible for identifying and developing new business opportunities outside the geography and/or scope of current business units. The group also worked with and across business units to deliver the annual 5-year corporate strategic plan. New business development areas include natural gas midstream, compressed natural gas, liquefied natural gas, combined heat and power, distributed energy systems, renewable energy (biogas, solar, wind), and energy services

Gas Technology Institute, Des Plaines, IL. *Vice President and Chief Technology Officer*, 2007 – 2013

- Responsible for GTI's Office of Technology and Innovation, which leads development and implementation of GTI's long-term technical strategy and vision, manages corporate Internal Research and Development program, initiates new business opportunities and partnerships, and leads corporate Environmental, Health, and Safety function.
- Revamped internal research and development process, focusing investment on strategic high-growth opportunities included gas processing, energy conversion, exploration and production, and electrochemistry.
- Supported business development through partnering with domestic and international stakeholders. Reactivated participation in International Gas Union, and fostered new relationships with start-ups, clean tech accelerators, national labs, and academic institutions. More than a dozen joint development agreements signed. Significant contracts include $2 million biogas study and $1.5 million ARPA-E MOVE contract.
- Executed multi-year program to continuously improve GTI's EH&S culture. Addressed regulatory compliance issues in the first year. Sequentially rolled out formalized process hazards assessment at project execution and proposal stages, incident reporting with root cause analysis, and management of change process. Reinforced the safety culture through supervisor training and 5S program.

GreenFuel Technologies Inc, Cambridge, MA. *Vice President, Process Development*, 2005 – 2007

- Responsible for growing Research & Development (R&D), Engineering, and Operations teams for award-winning venture-capital start-up developing micro-algae production processes for CO2 mitigation and renewable energy production, including biodiesel, ethanol, and methane. Total department budget $5 million.
- Identified limitations of original technology platform and was hired to re-direct technology development program. Within the first three months developed a novel low-cost micro-algae bioreactor system suitable for integration with high-CO2 exhaust streams. Continued refinement of system design to reduce capital costs by half and operating costs by a tenth, resulting in three patent applications.
- Built team from 7 to 20 professionals in 8 months. Completely revised system design, program management plan, and testing plan for Arizona pilot facility. Responsible for managing patents, trademarks, and intellectual property for company, and multiple collaborations with external partners.

Millipore Corporation, Bedford, MA. *R&D Manager, Advanced Technology Department*, BioPharm Division, 2003 – 2005.

- Developed patented integrity test protocol for virus membrane sheets and housings, and associated hydrodynamic model for interpreting experimental results. A unique aspect of the test is that it is non-destructive and easily repeatable, resulting in the first correlated virus test suitable for pre- and post-use validation. Patent nationalized in more than 30 countries, and the test incorporated into all virus product lines, creating technical differentiation for a multi-million dollar business.

Air Products and Chemicals, Inc. Allentown, PA. 1986 – 2003

Engineering Manager Services and Solutions, 2002 – 2003

- Responsible for proposal through execution of projects in a new business area servicing membrane and adsorption systems for hydrogen production and purification. Developed and presented numerous proposals, with awards valued at $4 million. Managed multi-functional teams to close out reliability and quality issues. Successfully completed start-ups on projects with a total value of $15 million.
- Lead a multifunctional team identifying commercial opportunities related to greenhouse gas emissions reduction.

Engineering Manager, Prism Hydrocarbon Systems. 1999 – 2002

- Responsible for internationally based group of 10 process engineers building modularized membrane and adsorption systems. Duties include sales presentations; responding to preliminary and final bids; technical sign-off for process engineering deliverables; system start-ups and final acceptance; competitive analysis; and engineering liaison to R&D.
- On-time execution of approximately 20 projects/year across N. America, Europe, and Asia with total value of $15-$25 million/yr. Managed more than 50 firm bids and approximately 150 budgetary inquiries per year.

Business Development Manager, Corporate Commercial Development. 1996 – 1999

- Company's technical program manager for consortium to develop black liquor gasification. Developed intellectual property strategy (one patent granted, 14 idea disclosures documented). Led feasibility study for major client to define first-of-a-kind $76 million facility, and led successful proposal to DOE for $2.5 million Phase 1 engineering study and pilot plant program.
- Completed detailed review of separation requirements for the North American natural gas. Segmented market and developed detailed profiles that lead to several prospects for three current business areas. Pursued three technology-push opportunities for Corporate R&D programs.

R&D Manager and Lead Process Engineer Environmental Energy Systems - 1991 – 1996; *Process and R&D Engineer*, 1986 – 1991

- Company's technical program manager to four-company consortium developing the DOE Clean Coal $350 million Four Rivers project, demonstrating pressurized circulating fluidized bed combustion. Participated in operation and/or data analysis of four pilot scale units, and completed technical review and risk assessment for process.
- Process engineering and R&D on diverse energy technologies including scrubbers for power plants, landfill gas, cogeneration plants, waste-to-energy processes, and wastewater treatment facilities.

EDUCATION

University of California, Berkeley, Berkeley, MA
Ph.D. Chemical Engineering, 1986
University of Cincinnati, Cincinnati, OH
B.S Chemical Engineering, Magna Cum Laude, 1981

ADVISORY AND EXTERNAL ROLES

International Gas Research Conference Committee, *Vice Chair,* 2007-2010
International Gas Union's New Research and Innovation Committee PGC-F, *First Chair*
International Gas Research Conference, Copenhagen, *Chair,* 2014
MAAT Energy, *Senior Process, Commercialization, and Strategic Advisor*, 2025 – Present
Rise Reforming, *Scientific Advisor*, 2025 – Present
ZettaConn, *Senior Advisor*, 2025 – Present

SELECTED PUBLICATIONS AND PRESENTATIONS

Overview of ARPA-E and FLECCS Phase 2, 2024 FECM/NETL Carbon Management Research Project Review Meeting, Pittsburgh PA, August 9, 2024.

ARPA-E FLExible Carbon Capture and Storage (FLECCS), Net-Zero Flexible Power: High Capture Rate Project Review Meeting, Philadelphia PA, June 6, 2024.

Invited Panelist, PTAC Methane Leadership Summit, Banff, Alberta, April 17-18, 2024.

ARPA-E REMEDY VAM Projects (Reducing Emissions of Methane Every Day of the Year), 2024 Global Methane Forum Mobilizing Methane Action, Geneva, Switzerland, 18-21 March 2024.

Innovating for the Future Panel, World Liquid Gas Association Innovation Summit, Washington DC, February 20, 2024.

Session 7: Potential Synergies and Co-benefits of Atmospheric Methane Removal Technologies Panel Moderator, National Academies Atmospheric Methane Removal Needs, Challenges, and Opportunities—A Workshop, Washington DC, October 17-18, 2023.

ARPA-E Activities, 2023 FECM/NETL Carbon Management Research Project Review Meeting, Pittsburgh PA, August 28, 2023.

Invited Panelist Session 10: Establishing a Resilient Foundation, PTAC Methane Leadership Summit, Banff Springs Alberta, April 26-27, 2023.

Leveraging Propane to Expand Natural Gas Distribution Systems, E. Bittner, A. Socarras, R. Zola, and J. Lewnard, World Gas Conference, Washington DC, June 27, 2018.

Options for Accommodating Power Generation's Gas Infrastructure Requirements, LDC Gas Forum Northeast, Boston MA, June 6, 2017.

Regional Energy Trends Shaping Opportunities, J. Lewnard, AGC Maryland Deal Forum, Baltimore MD, May 20, 2015.

Utilities and Midstream Businesses, Jack Lewnard, Marcellus Midstream Conference, Pittsburgh PA, Feb. 28, 2015.

Unconventional Gas: Processing Challenges, 3rd Global Unconventional Gas Conference, Beijing, China November 5-7, 2012.

Natural Gas: Beyond the Facts and Figures, Jack Lewnard, 2012 World Gas Conference Youth Program, Kuala Lumpur, Malaysia, June 5, 2012.

Creating Value Through Innovation, David Carroll and Jack Lewnard, World LNG Series: Americas Summit 2012, San Antonio, Texas April 24, 2012.

GTI – Addressing Methane Emissions, Kiran Kothari and Jack Lewnard, ARPA-E SNIFFER Emerging Ideas Workshop, Washington DC, March 29, 2012.

New Natural Gas Utilization Technologies – Best Use of Abundant Supplies, Jack Lewnard, 2011 Global Unconventional Gas Conference, Beijing, China, September 14-15, 2011.

Overview of Small-Scale Gas-Fired Power Generation Technologies and Demonstrations, John Pratapas, Sam Bernstein, and Jack Lewnard, ARPA-E Workshop, Washington, DC, June 1, 2011.

2011 Pacific Energy Summit, invited panelist for "Ensuring Future Supplies: Mapping a natural gas-powered strategy" and "Potential for Unconventional Gas in the Asia-Pacific", Jakarta, Indonesia, February 21-24, 2011.

Natural Gas Applications: Technology Challenges, Current Status and Future, Jack Lewnard, Bill Liss, and Eddie Johnston, RPSEA Natural Gas Path to Clean Energy Conference, Austin, Texas, November 18, 2010.

Lessons in Clean Tech Commercialization: Tale of Two Technologies, Quinton Ford and Jack Lewnard, Midwest CleanTech 2010 Conference, Chicago Illinois, September 15, 2010.

Natural Gas: A Vision for Today and the Future, Bill Liss, Eddie Johnston, Vann Bush, and Jack Lewnard, Canadian Gas Association Natural Gas Technology Futures Workshop, Toronto, Ontario, Feb 9-10 2010.

Technology Developments Positioning Gas's Future, Bill Liss, Eddie Johnston, Vann Bush, and Jack Lewnard, Southern Gas Association Executive Conference, Scottsdale, AZ, Nov 16-18, 2009.

Energy: Challenges and Options, Northwestern University Energy Day, Evanston, IL Nov 7, 2009.

Natural Gas End Use: A Vision for Today and the Future, American Gas Association Executive Conference, Williamsburg, VA, Sep 13-14, 2009.

Natural Gas Utility in a Carbon Constrained World — A Vision of the Future, Eddie Johnston and Jack Lewnard, American Gas Association Operations Conference, Pittsburgh, PA May 19-20, 2009.

Unconventional Gas Technology: Challenges and Progress, Kent Perry, Guy Lewis and Jack Lewnard, CERA Week 2009, Houston TX, Feb. 9-13, 2009.

Natural Gas Energy Efficient Technology Developments, Consortium for Energy Efficiency Fifth Annual Industry Partners Meeting, New Orleans, LA, October 15-16, 2008.

The Role of Natural Gas in a Sustainable Energy Future, Indiana Energy Conference, Indianapolis, IN, October 2, 2008.

Biomass Gasification and Biomass to Liquid Fuel Collaborations, Vann Bush and Jack Lewnard, Second Generation Biofuels Development Summit, Baltimore MD, May 16, 2008.

Status of GTI's Coal and Biomass Programs, Vann Bush and Jack Lewnard, Ozarks-1 Energy Conference, Springfield MO, February 22, 2008.

Gas Technology Institute Transmission and Distribution R&D Programs, Interstate Natural Gas Association of America Annual Meeting, Phoenix, AZ, November 10, 2007.

Emission to Biofuel Process, Bill Kubasek and Jack Lewnard, American Oil Chemists' Society Annual Meeting, Quebec City, Quebec, MA, May 13-18, 2007.

Green energy from Geothermal Emissions, John Piechocki and Jack Lewnard, IceTec Annual R&D Meeting, Reykjavik, Iceland, May 8, 2007.

Emerging Bio-Energy Technologies – Possibilities and Challenges for a Constrained Future, Jack Lewnard, Saint Gobain Annual Innovation Conference, Northboro, MA, April 24, 2007.

Round-Table Panel Renewable Bioenergy from Marien Environment, 8th International Marine Biotechnology Conference, Eilat, Israel March 11-16, 2007.

Potential for BioFuels from Algae, Otto Pulz and Jack Lewnard, 2007 American Academy for Advancement of Sciences Annual Meeting, San Francisco, CA, February 15-19, 2007 Chapter 11, Virus Filtration Process Design and Implementation.

Michael W. Phillips, Glen Bolton, Mani Krishnan, John J. Lewnard, Bala Raghunath, in Process Scale Bioseparations for the Biopharmaceutical Industry, Abhinav Shukla, Mark Etzel, and Shishir Gadam, editors Integrity Testing of Normal Flow Parvovirus Filters using Air-Liquid based Tests, Glen Bolton, Jason Cormier, Mani Krishnan, John Lewnard, and Herbert Lutz, BioProcessing Journal, Spring 2006.

Modeling flow through microfiltration membranes using data from high-resolution 3D imaging, Karsten E. Thompson, J.T. Fredrich, Chase Duclos-Orsello, and Jack Lewnard 3, AIChE National Meeting, Cincinnati, OH, Oct. 30-Nov. 4, 2005.

3-D Imaging of Microfiltration Membranes and Application of Image Data in Pore-Scale Transport Modeling, Karsten Thompson, J. T. Fredrich, Chase Duclos-Orsello, and Jack Lewnard, North American Membrane Society 2005 Annual Meeting, Providence, RI, June11-15, 2005.

Network Modeling of Sterilizing Grade Membranes, Chase Duclos-Orsello, Jack Lewnard, Michael Phillips and Anthony DiLeo, Gordon Research Conference Flow & Transport In Permeable Media, Oxford, UK, July 11-16, 2004.

Techniques for CO2 Capture, J.M. Abrardo, R.J. Allam, J. Lewnard, Carbon Sequestration Conference, Houston, Texas, October 24-25, 2002.

Black Liquor Gasification: The Impact of Gasifier Pressure and Temperature on C-H-O-S Gas Speciation and Tar Components, Scott Sinquefield, Viboon Sricharoenchaikul, Jim Frederick, David C. Dayton, Daniel Carpenter, Richard French, Matthew Ratcliff, and Jack Lewnard, 2001.

International Recovery Conference, Whistler, British Columbia Black Liquor Gasification in a Pressurized Entrained-Flow Reactor: The Impact of Gasification Pressure on Carbon-Containing Gases and Fixed Carbon Yields, W. J. Frederick, Jr., V. Sricharoenchaikul, S.A. Sinquefield, K. Iisa, D.C. Dayton, and J.J. Lewnard, 2000.

AIChE National Meeting, Los Angeles November 2000.

Technical Challenges to Black Liquor Gasification, D.R. Ruprecht and J.J. Lewnard, 1999.

AIChE National Meeting, Dallas, TX October 1999.

The Feasibility of Recovering Energy from Paper Mill Residual Fibre by Fluidized Bed Combustion, F. Preto, E.J. Anthony, B.E. Herb, and J.J. Lewnard, in Combustion Technologies for a Clean Environment, pp. 587-598, Edited by Mariada Graça Carvalho, Woodrow A. Fiveland, F.C. Lockwood, and Christos Papadopoulos, in Samuelsen, G.S. (Series Editor) "Energy, Combustion, and the Environment," Volume 2, Gordon and Breach Publishers, 1999.

Advanced Membrane Devices, Interim Report October 1996-September 1997, Daniel V. Laciak, Michael Langsam, John J. Lewnard and Glenn C. Reichart, DOE Contract DE-FC36-94GO10004.

Natural Gas Upgrading - Tapping Underutilized Energy Sources, Daniel V. Laciak, Michael Langsam, Kenneth Jones, John J. Lewnard and P.S. Puri, 1998 Working Conf. on Gas Separation, Hershey, PA, June 1998.

Bailly Station Advanced Flue Gas Desulfurization Demonstration Program, G.B. Manavi, J.J. Lewnard, D.C. D.A. Styf, and T.A. Sarkus, 4th Annual Clean Coal Technology Conference, Denver, CO, Sept. 5-8, 1995.

The Effect of FBC Particle Characteristics on Erosion of 1020 Carbon Steel, B. Lindsley, A. Marder, and J.J. Lewnard, accepted to Wear J., 1995.

Options for Recovering Energy from Paper Mill Residual Fibre, E.J. Anthony, B.E. Herb, and J.J. Lewnard, Pulp and Paper Canada, 96 (3), p. 79, 1995.

Four Rivers Second Generation Pressurized Circulating Fluidized Bed Combustion Project, E.P. Holley, J.J. Lewnard, G. von Wedel, K.W. Richardson, and H.T. Morehead, Proc. 13th International Conf. Fluidized Bed Combustion, Kissimmee, FL, May 7-10, 1995.

An Independent Power Producer's Perspective on Pressurized Fluidized Bed Combustion, S.I. Wang, D.J. Taylor, T.P. Wendahl, and J.J. Lewnard, Proc. 1994 International Joint Power Conf, Phoenix, AZ, Oct., 1994.

Four Rivers Demonstration of the Second Generation Pressurized Circulating Fluidized Bed Combustion Process, T.P. Wendahl, J.J. Lewnard, E.P. Holley, K.W. Richardson, G. von Wedel, W.F. Domeracki, and L.K. Carpenter, Proc. 1994 International Joint Power Conf, Phoenix, AZ, Oct., 1994.

Demonstration of the Advanced Pressurized Circulating Fluid Bed Combustion Process at the Four Rivers Project, J.J. Lewnard, E.P. Holley, K.W. Richardson, G. von Wedel, and W.F. Domeracki, Pittsburgh Coal Conf., Pittsburgh, PA, Sept. 12-16, 1994.

The Four Rivers Energy Modernization Project Advanced Pressurized Circulating Fluidized Bed Combustion Process Project Overview and Status, E.P. Holley, J.J. Lewnard, D.C. Vymazal, G. von Wedel, K. Richardson, W.F. Domeracki, and L.K. Carpenter, 3rd Annual Clean Coal Technology Conference, Chicago, IL, Sept. 6-8, 1994.

The Four Rivers Energy Project in Clean Coal V, T.R. Tsao, E.P. Holley, J.J. Lewnard, G. von Wedel, K. Richardson, J.D. McClung, W.F. Domeracki, T.E. Lippert, and L.K. Carpenter, 1994 Intersociety Energy Conversion Engineering Conf., Monterey, CA, Aug 7-12, 1994.

Options to Eliminate NH4Cl Plumes from a Circulating Fluidized Bed Combustor Using Selective Non-Catalytic NOx Reduction, T. Hess, J. Lewnard, H. Pham, T. Shirley, and P. Valone, ASME 1994 Industrial Power Conf., San Francisco, March 28-29, 1994.

Project Overview and Status: Four Rivers Energy Modernization Project, E.P. Holley, J.J. Lewnard, S.I. Wang, K.W. Richardson, H.T. Morehead, and G. von Wedel, 56th Annual American Power Conf., Chicago, April 25-27, 1994.

Fluidized Bed Combustion Offers Solutions to the Problem of Paper Mill Sludge Disposal, B.E. Herb, J.J. Lewnard, K.J. Siebert, D.C. Wolfson, E.J. Anthony, and F. Preto, Progress in Paper Recycling, p. 45, Nov. 1993.

Options for Recovering Energy from Paper Mill Residual Fiber, B.E. Herb, and J.J. Lewnard, TAPPI/AIChE Pulping Conf., Atlanta, Nov. 14-18, 1993.

Commercialization of the Second Generation Pressurized Circulating Fluid Bed Combustion Process, T.R. Tsao, E.P. Holley, J.J. Lewnard, G. von Wedel, K. Richardson, J.D. McClung, W.F. Domeracki, and T.E. Lippert, 1993 Power-Gen Conference, Dallas, November 17-19, 1993.

Environmental and Economic Options for Recovering Energy from Residual Fibers, E.J. Anthony, B.E. Herb, and J.J. Lewnard, Second Research Forum on Recycling, Ste Adele, PQ, Canada, Oct. 5-7, 1993.

Deactivation of Methanol Synthesis Catalysts, G. W. Roberts, D. M. Brown, T. H. Hsiung, and J. J. Lewnard, Ind. Eng. Chem. Res., 32 (8), p. 1610, 1993.

The Erosion/Corrosion Behavior and Particle Characteristics of Several CFB Materials, B. Lindsley, A. Marder, and J.J. Lewnard, 10th Annual International Pittsburg Coal Conf., Pittsburg, PA, Sept. 20-24, 1993.

Fluidized Bed Combustion Offers Solutions to the Problem of Paper Mill Sludge Disposal, B.E. Herb, J.J. Lewnard, K.J. Siebert, D.C. Wolfson, E.J. Anthony, and F. Preto, AIChE Summer National Meeting, Seattle, Aug. 15-19, 1993.

Effect of Design and Operating Parameters on Performance of CFB Cyclones, B.E. Herb, J.J. Lewnard, T.R. Tsao, and J. Zenz, 4th International Conference on Fluidized Beds, Somerset, PA, Aug. 1-5, 1993.

Energy Recovery from Pulp and Paper Residual Fibers in a Fluidized Bed Boiler, B.E. Herb, J.J. Lewnard, K.J. Siebert, and D.C. Wolfson, New England TAPPI Conference, Cape Cod, June 11- 13, 1993.

The Effect of FBC Particle Characteristics on Erosion of a Low Alloy Steel, B. Lindsley, A. Marder, and J.J. Lewnard, Proc. 1993 Inter. Conf. Fluidized Bed Combustion, ASME, p. 803.

The Technical, Environmental, and Economic Feasibility of Recovering Energy from Paper Mill Residual Fiber, E.J. Anthony, F. Preto, B.E. Herb, and J.J. Lewnard, Proc. 1993 Inter. Conf. Fluidized Bed Combustion, ASME, p.239.

Fluidized Bed Combustion System for Energy Recovery from Paper Mill Residual Fibers, B.E. Herb, J.J. Lewnard, and E.J. Anthony, Proc. Wastepaper IV Conf., Chicago, April 13-15, 1993.

The Role of Cyclone Performance in CFB Operations, B.E. Herb, J.J. Lewnard, and T.R. Tsao, Proc. CIBO Fluid Bed IV, Pittsburg, PA, December 8-9, 1992.

The Technical and Economic Feasibility of Cogeneration Using Secondary Residual Fibers, J.J. Lewnard, B.E. Herb, K.J. Siebert, and D.C. Wolfson, AIChE/TAPPI Pulping Conference, Boston, November 5, 1992.

Cyclone Performance: The Key to Feed Utilization in Circulating Fluidized Bed Boilers, B.E. Herb, J.J. Lewnard, T.R. Tsao, and S.I. Wang, Proc. 54th Annual American Power Conference, Chicago, April 13-15, 1992.

One-Step Slurry-Phase Syngas Conversion to Hydrocarbons Using a Mixed Cu/ZnO/Al2O3-Zeolyte Catalyst System, T.A. Dahl, T.H. Hsiung, J.J. Lewnard, and R.P. Underwood, AIChE Spring National Meeting, New Orleans, March 29-April 2, 1992.

Feedstock Optimization for CFB Boilers, J.J. Lewnard, C.A. Nalesnic, T.R. Tsao, and H.F. Via, Proc. ASME Industrial Power Conf., p.111, 1992.

Coal, Limestone, and Ammonia Conversion in a CFB Boiler, J.J. Lewnard, 2nd Annual ARIPPA Technology Symposium, Aug. 8, 1991.

Effect of Residence Time on Feed Utilization in a Circulating Fluidized Bed Boiler, J. J. Lewnard, K. P. Wong, T. R. Tsao, and S. I. Wang, Proc. 53rd Annual American Power Conf., p. 1056, 1991.

Novel Technology for the Synthesis of Dimethyl Ether from Syngas, D. M. Brown, B. L. Bhatt, T. H. Hsiung, J. J. Lewnard, and F. J. Waller, Catalysis Today, 8, p.279, 1991.

Thermal Deactivation of Methanol Synthesis Catalyst in a Slurry Reactor, G. W. Roberts, D. M. Brown, T. H. Hsiung, and J. J. Lewnard, Catalyst Deactivation, 1991, C.H. Bartholomew and J.B. Butt, Ed., p. 351, 1991.

Synthesis of Dimethyl Ether from Syngas in a Slurry Reactor, T. H. Hsiung, B. L. Bhatt, J. J. Lewnard, and D. M. Brown, AIChE Summer National Meeting, San Diego, CA August 19-22, 1990.

Catalyst Poisoning During the Synthesis of Methanol in a Slurry Reactor, G.W. Roberts, D.M. Brown, T.H. Hsiung, and J. J. Lewnard, Chem. Eng. Sci., 45 (8), p. 2713, 1990.

Single-Step Synthesis of Dimethyl Ether in a Slurry Reactor, J. J. Lewnard, T. H. Hsiung, J. F. White, and D. M. Brown, Chem. Eng. Sci., 45 (8), p. 2735, 1990.

Diffusion of H+ and OH- in Porous Solids, J. J. Lewnard, E. E. Petersen, and C. J. Radke, J. Chem. Soc., Faraday Trans. 1, 84 (11), p. 3927, 1988.

Temperature Effects on Catalyst Activity in the Liquid Phase Methanol Process, J. J. Lewnard and T. H. Hsiung, Proceedings of the 10th North American Catalyst Society Meeting, May 17- 22, 1987, p. 350, 1988.

Recent Activities Towards Developing the Liquid Phase Methanol Process, J. J. Lewnard, Pradip Rao, and P. R. Stepanoff, Indirect Liquefaction Contractors' Review Meeting (PETC), December 4, 1986.

Resume updated February 2026