



CLEAN COAL TODAY

A NEWSLETTER ABOUT INNOVATIVE TECHNOLOGIES FOR COAL UTILIZATION

ANNUAL INDEX OF ARTICLES

Clean Coal Today is a quarterly newsletter of the U.S. Department of Energy (DOE) Office of Clean Coal (OCC). Its primary objective is to inform OCC stakeholders of the progress and status of a wide range of OCC R&D activities. *Clean Coal Today* features news of the latest coal-related R&D advances, and reports on timely policy and environmental topics. Progress of various demonstration programs is reported, including the Clean Coal Power Initiative (CCPI), Power Plant Improvement Initiative (PPII), and the original Clean Coal Technology (CCT) Demonstration Program. A News Bytes column appears in every issue, and recurring columns include R&D Milestones achieved by in-house and contractor researchers, International Initiatives, State and Regional activities, and guest stakeholder articles.

Clean Coal Today is mailed to some 3,500 domestic and international readers, and also may be found on the Internet as part of the Clean Coal Technology Compendium (www.netl.doe.gov/technologies/coalpower/cctc/newsletter/newsletter.html). The newsletter reaches a broad customer/stakeholder audience including users and vendors of clean coal technologies, the coal R&D community, regulators and public policy makers, environmental organizations, financiers, exporters, public interest groups, and interested members of the public in general.

Some of the key actions reported in *Clean Coal Today* during the past year included progress in two major CCPI projects, membrane separation advances in FE's Hydrogen program, the creation of a Turbine Consortium, and important international activities including Capacity Building Workshops as part of the Carbon Sequestration Leadership Forum. There were well-attended conferences on carbon sequestration, air quality, and mercury control technology. And there was significant activity on various fronts of the carbon sequestration program.

Beginning with Issue No. 1, published in 1990, this *Index of Articles* for issues 1-73 of *Clean Coal Today* will assist readers in identifying articles of interest. Pages 2-9 present articles on CCT, CCPI, and PPII projects organized by technology category. Pages 10-25 present all other articles arranged by subject area.

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- DOE and State Department Hold First Sequestration Forum Summer 2003: 1
- U.S. DOE is Carbon Sequestration Leadership Forum Secretariat Fall/Winter 2003: 10
- CSLF Meets in Rome Spring 2004: 8
- Sequestration Leadership Forum Meets in Australia Winter 2004: 1
- CSLF Expands Participation, Meets in Berlin Winter 2005: 8
- CSLF Capacity Building Workshop Summer 2007: 8

— CLEAN COAL TECHNOLOGY PROGRAM ACTIVITIES —

– CCT Conferences –

- Notable First Annual Clean Coal Conference: Technology Developers Linked with Wide Range of Users Fall 1992: 1
- Second Annual CCT Conference Examines Technology Markets; CCT Markets Session Examines Market Opportunities at Home and Abroad; Deployment/Outreach Panel Addresses Opportunities for Commercial Success Fall 1993: 1, 5, 6
- Third Annual CCT Conference Highlights Program Successes; CCT International/Domestic Markets Explored by International and Industry Analysts Winter 1994: 1, 6
- The Global Opportunity: A Message from Pat Godley, Assistant Secretary for Fossil Energy (Special Fourth Annual CCT Conference Edition) Fall 1995: 1
- Welcome — From Our Sponsors (Special Fourth Annual CCT Conference Edition) Fall 1995: 1
- A Message from the Editor (Fourth Annual CCT Conference) Winter 1995: 3
- CCT Conference Preview (Fifth Annual CCT Conference) Winter 1996: 12
- Fifth Annual CCT Conference Addresses CCT's Future Spring 1997: 1
- Thanks to CCT Conference Sponsors (Fifth Annual CCT Conference) Spring 1997: 3
- Sixth Clean Coal Technology Conference Preview Spring 1998: 12
- CCTs Technical Progress Update (Sixth Annual CCT Conference) Summer 1998: 4
- Seventh Clean Coal Technology Conference Preview Summer 1999: 15
- DOE Clean Coal and Power Conference Fall 2001: 2
- Clean Coal and Power Conference Explores Coal's Future Winter 2001: 1
- DOE and U.S.-China Conferences Focus on Coal Fall/Winter 2003: 1
- Clean Coal Conference Highlights Technology Promise Winter 2005: 1

– CCT Program Direction –

- Fourth PON Release Near Winter 1990: 5
- Comprehensive Reports to Congress for Clean Coal Technology Projects Winter 1990: 11
- Round IV Update Spring/Summer 1991: 7; Winter 1991: 3;
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• Completed Projects — Participants' Final Reports		Spring 1998: 11; Summer 1998: 16
• Completed CCT Projects Summarized in New Publications		Fall 1999: 5
• Timeline of Active CCT Projects		Summer 2000: 15
• New Clean Coal Efforts Gain Momentum		Summer 2001: 1
• Progress Under Two Clean Coal Funding Vehicles		Winter 2001: 7
– CCT Program Outreach –		
• Debut of <i>Clean Coal Today</i>		Winter 1990: 1
• Clean Coal Outreach		Spring 1991: 1; Spring 1996: 18
• Exhibits Accent Reducing Greenhouse Gas Emissions (Clean Coal Celebrates Earth Day 1994)		Spring 1994: 1
• DOE Launches New Clean Coal Technology Web site (CCT Compendium)		Spring 1998: 9; Fall 1999: 13
– CCT Successes and Commercialization –		
• Introducing the Global CCT Opportunity (Fourth Annual CCT Conference)		Winter 1995: 1
• O'Leary Heralds Wabash Startup (Fourth Annual CCT Conference)		Winter 1995: 1
• CCT Commercialization Challenges (Fourth Annual CCT Conference)		Winter 1995: 4
• International CCT Deployment Needs Strong U.S. Support (Fourth Annual CCT Conference)		Winter 1995: 5
• Improving the "Enabling Environment" for CCTs (Fourth Annual CCT Conference)		Winter 1995: 8
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• DOE/Industry Seminars Identify CCT Opportunities and Challenges		Winter 1997: 4
• Challenges and Opportunities for Clean Coal Technology (Sixth Annual CCT Conference)		Summer 1998: 1
• Carbon Offsets Create Business Opportunities for CCTs (Sixth Annual CCT Conference)		Summer 1998: 10
• CCT Program Successes		Summer 1999: 11
• Clean Coal Technology in the Next Millennium (Seventh Annual CCT Conference)		Fall 1999: 3
• Successful Demonstration of SNCR at AEP's 600-MWe Cardinal Plant		Summer 2000: 6
• Powerplant Award, Multiple Visits Precede JEA Dedication		Fall/Winter 2002: 1
• FE Encourages Small Business Research		Fall/Winter 2007: 6
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• Computer Code Can Help Build Better Fluidized Beds		Spring 2004: 12
• Virtual Reality to Improve New Power Plant Designs, Lower Costs		Summer 2004: 4
• Computational Methods for Hydrogen Membranes		Spring 2005: 8
• Technology Development through High-Performance Computing		Summer 2005: 10
• High-Fidelity Process Co-Simulation of Advanced Power Generation Systems		Fall 2006: 6

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• Clean Coal Technology Workshop in India		Winter 1996: 5
• DOE Sponsors CCT and Coal Utilization Workshop		Winter 1997: 9
• Ukraine Conference Highlights Financial Recovery, Obstacles to Power Sector Development		Summer 1998: 12
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• Pittsburgh Coal Conference – Panel Highlights Asia Energy Picture		Winter 1998: 5
• First Annual Meeting of U.S.–China Energy and Environmental Technology Center		Summer 1999: 9
• U.S./Japan Workshop Highlights R&D Cooperation		Summer 1999: 9
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• Kyoto Update: COP 5		Winter 1999: 9
• CoalTech '99 Conference in Jakarta, Indonesia		Winter 1999: 12
• DOE Participates in International Conference in India		Spring 2000: 10
• FE Hosts Annual NO _x Specialty Conferences		Fall 2000: 6
• Two Major Conferences in China Under DOE–MOST Protocol		Spring 2001: 8
• Gasification Technologies Workshop for Environmental Regulators		Summer 2001: 8
• NETL Hosts Sensors and Controls Workshop		Summer 2001: 9
• First National Conference on Carbon Sequestration		Fall 2001: 3
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• Combustion Workshop Solicits Stakeholder Input		Spring 2002: 11
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• First National Conference on Carbon Sequestration to be Held		Winter 2000: 8
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• NETL Conference on PM _{2.5} and Electric Power		Summer 2002: 9
• Mercury/PM _{2.5} Conference Addresses Regulatory and Technology Issues		Fall/Winter 2002: 13
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• Regional Partnerships Lead U.S. Carbon Sequestration		Summer 2007: 1
• CSLF Capacity Building Workshop		Summer 2007: 1
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• Novel Concepts Awards		Summer 1998: 14
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• Energy Secretary Issues Carbon Sequestration Challenge (Seventh Annual CCT Conference)		Fall 1999: 1
• Carbon Sequestration Workshop Focuses on R&D		Winter 1999: 8
• Kyoto Update: COP 5		Winter 1999: 9
• Carbon Products Consortium Reviews Accomplishments and Future Research (guest article)		Winter 2000: 4
• Fossil Energy's CO ₂ Sequestration Program Gains Momentum		Winter 2000: 6
• First National Conference on Carbon Sequestration to be Held		Winter 2000: 8
• CO ₂ Capture RD&D Test Network Created		Winter 2000: 9
• International CO ₂ Ocean Sequestration Field Experiment: 2000 Oceanographic Research Cruise		Winter 2000: 10
• First National Conference on Carbon Sequestration		Fall 2001: 3
• TVA Mined Land Becomes Carbon Sink		Fall 2001: 8
• New APEC Report on CO ₂ Reduction Options		Winter 2001: 8
• Coalbed Methane — Enhancing Production and Sequestering CO ₂		Summer 2002: 7
• Brine Aquifers for CO ₂ Sequestration		Summer 2002: 10
• Weyburn Demonstrating New CO ₂ Storage, Monitoring, and Verification Techniques		Fall/Winter 2002: 12
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• DOE Hosts First Meeting of Regional Sequestration Partnerships		Fall/Winter 2003: 4
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• Carbon Sequestration Program Explores Options		Spring 2004: 6
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• Update — Clean Coal Air Toxics Testing Programs		Winter 1993: 3
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• CCT NO _x Controls Realize Commercial Acceptance		Winter 1997: 5
• Monitoring Effort Initiated Under PM _{2.5} Program		Summer 1998: 8
• FE's Mercury Program – Quality Measurements and Cost-Effective Controls		Summer 2000: 8
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• Environmental Benefits Topical Report Published		Summer 2001: 6
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• 2007 Budget Emphasizes Clean Coal	Spring 2007: 7

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| • Results Successful from Treated-Wood/Coal Cofiring Tests | Spring 2000: 8 |
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| • By-Products Consortium Funds R&D Proposals | Winter 1999: 4 |
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| • International CCT Finance Seminar | Fall 1996: 7 |
| • World Bank’s Clean Coal Initiative | Spring 1997: 4 |
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• TDA Joins DOE in Supporting Brazil's Quest For Clean Energy		Summer 1998: 12
• Mexico FBC Options		Spring 1999: 8
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• U.S. and Canadian Cooperation on Carbon Sequestration Research		Fall 2001: 12
• U.S.–U.K. Workshop on Advanced Materials		Summer 2005: 12
• U.S. and Canada Cooperate on Oxy-Combustion		Fall 2005: 9
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• Membrane Improvements Support Gas Separation		Winter 2001: 4
• High-Temperature Materials Testing Record at CERF		Spring 2002: 10
• Consortium Makes Progress on Materials Development		Spring 2004: 11
• Advances in Membrane Technology for Air Separation		Fall 2004: 7
• Materials Research at Albany Research Center		Spring 2005: 4
• U.S.–UK Workshop on Advanced Materials		Summer 2005: 12

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• Innovative Oxygen Separation Membrane Prototype		Fall 2006: 1
• Advanced Separation Consortium		Winter 2006: 4

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• Power Systems Development Facility: The Focus of DOE		Summer/Fall 1997: 8
• Advanced Coal-Based Power and Environmental Systems '98 Conference		Fall 1998: 7
• Role of Gasification for the 21 st Century (Institute of Gas Technology)		Spring 1999: 6
• Power Systems Development Facility – Ensuring Clean Affordable Power for the 21 st Century		Fall 2000: 1
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• Laser Technology Has Potential to Enhance Gasifier Reliability		Fall 2001: 11
• DOE Developing Trapped Vortex Combustor Concept		Spring 2002: 6
• Gasifier Testing at PSDF		Summer 2002: 1
• Ramgen Demonstrating New Turbine Concept		Fall/Winter 2002: 3
• Gasification Markets and Technologies Report		Fall/Winter 2002: 11
• Interagency Group Fosters Turbine Technology		Fall/Winter 2002: 16
• Illinois Grants Permit to DOE-Funded LEBS Project		Spring 2003: 9
• Clean Energy Systems Meets Near-Zero Emissions Levels		Summer 2003: 6
• Zero Emissions Technologies: A New Initiative		Spring 2004: 1
• Virtual Reality to Improve New Power Plant Designs, Lower Costs		Summer 2004: 4
• Advances in Membrane Technology for Air Separation		Fall 2004: 7
• Development of Transport Reactor Gasification at the PSDF		Winter 2004: 5
• DOE-Stamet, Inc. High-Pressure Feeder Research Program		Summer 2005: 7
• Technology Development Through High-Performance Computing		Summer 2005: 10
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• U.S. and Canada Cooperate on Oxy-Combustion		Fall 2005: 9
• Laser Ignition Plus Hydrogen Sparks Cleaner Combustion		Spring/Summer 2006: 12
• Demonstration of a 285-MW Coal-Based Transport Gasifier		Spring/Summer 2006: 14
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• Kentucky Pioneer IGCC/Fuel Cell Project Underway		Spring 2003: 5
• SECA Core Technology Program Review Meeting		Fall/Winter 2003: 3
• World’s Largest Clean Coal-Powered Fuel Cell		Fall 2004: 1
• New DOE Program to Advance Fuel Cell Central Power Stations		Fall 2005: 1
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• Materials Research at Albany Research Center: Sensing Corrosion Present Under Ash Deposits, Improving Refractories for Coal Gasifiers		Spring 2005: 4
• New DOE Program to Advance Fuel Cell Central Power Stations		Fall 2005: 1
• FutureGen Project Takes Shape		Winter 2005: 4
• FutureGen Update		Spring/Summer 2006: 3
• Hydrogen Turbines for Coal-Based IGCC and FutureGen		Spring/Summer 2006: 10
– Gasification –		
• Opportunities for IGCC		Winter 1996: 9
• Role of Gasification for the 21 st Century (Institute of Gas Technology)		Spring 1999: 6
• FE Shares Gasification Technology Options with Japan		Spring 2000: 10
• IGCC Protocol with India Signed		Winter 2000: 10
• Sulfur Removal From Gasification-Derived Syngas		Summer 2001: 4
• Gasification Technologies Workshop for Environmental Regulators		Summer 2001: 8
• Laser Technology Has Potential to Enhance Gasifier Reliability		Fall 2001: 11
• Gasifier Testing at PSDF		Summer 2002: 1
• IGCC Briefings Completed Under U.S.–China Protocol		Fall/Winter 2002: 10
• Gasification Markets and Technologies Report		Fall/Winter 2002: 11
• NETL Completes a Successful PDU Test		Fall/Winter 2003: 11
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• Development of Transport Reactor Gasification at the PSDF		Winter 2004: 5
• Materials Research at Albany Research Center: Sensing Corrosion Present Under Ash Deposits, Improving Refractories for Coal Gasifiers		Spring 2005: 4
• Hydrogen Turbines for Coal-Based IGCC and FutureGen		Spring/Summer 2006: 10
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• China Gasification and Liquefaction Workshop		Fall 2006: 11

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• Interagency Group Fosters Turbine Technology		Fall/Winter 2002: 16
• Low NO _x from IGCC Turbines		Spring 2005: 9
• Hydrogen Turbines for Coal-Based IGCC and FutureGen		Spring/Summer 2006: 10
• DOE FE Turbine Program Accomplishments		Spring/Summer 2006: 11
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• FE Organizes Separations Workshop for Vision 21 System		Fall 1998: 12
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• NETL Hosts Virtual Simulation Workshop		Winter 2001: 10
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• FETC’s “In-House” R&D		Winter 1998: 1
• New National Laboratory Established		Spring 2000: 5
• Albany Research Center Supports FE Mission		Summer 2000: 4
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• Climate Technology Award Goes to NETL Partner		Fall/Winter 2002: 9
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• NETL Hosts Foreign Service Officer Coal and Power Training		Fall 2004: 11
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• Role of Gasification for the 21st Century – Institute of Gas Technology		Spring 1999: 6
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• Energy & Environmental Research Center – EERC		Spring 2003: 10
• Coal-Based Hydrogen Coproduction with CO ₂ Capture – National Fuel Cell Research Center/Advanced Power and Energy Program (NFCRC), University of California, Irvine		Fall/Winter 2003: 7
• Japan’s Clean Coal Cycle (3C) Initiative		Winter 2004: 3
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• Clean Coal Centre Case Studies on Recent Fossil-Fired Plants		Fall/Winter 2007: 9
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• Power Plant Hall of Fame		Summer 2000: 3
– Internet/Information Services –		
• DOE TechLine Automated Fax Service		Winter 1991: 6
• FE International On-Line		Fall 1996: 6; Winter 1996: 5; Spring 1997: 6; Summer 1998: 9
• DOE Launches New Clean Coal Technology Web Site (CCT Compendium)		Spring 1998: 9; Fall 1999: 13
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• Power Generation Competition Threatens Clean Coal (Fourth Annual CCT Conference)		Winter 1995: 9
• Domestic Regulatory Challenges (Fourth Annual CCT Conference)		Winter 1995: 11
• Fossil Energy Role in Deregulation		Fall 1999: 10
• National Energy Policy Highlights		Summer 2001: 2
• Gasification Technologies Workshop for Environmental Regulators		Summer 2001: 8
• Mercury/PM _{2.5} Conference Addresses Regulatory and Technology Issues		Fall/Winter 2002: 13
• India Regulatory Workshop		Summer 2005: 12
• Energy Bill Supports Coal		Fall 2005: 8
• New U.S. Department of Energy Assistant Secretary (Jeffrey D. Jarrett) on Board		Winter 2005: 3
• 2007 Budget Emphasizes Clean Coal		Spring 2007: 7
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• Wisconsin Plan Emphasizes Fuel Diversity		Winter 2001: 12
• Ohio, A Partner in Clean Coal		Fall/Winter 2002: 6
• Coalbed Methane Forum Discusses DOE Resource Assessment		Spring 2005: 11

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| • Progress Under Two Clean Coal Funding Vehicles | | Winter 2001: 7 |
| • DOE Issued Solicitation for Clean Coal Power Initiative | | Spring 2002: 1 |
| • NETL Holds Clean Coal Power Initiative Preaward Meeting | | Spring 2003: 4 |
| • Clean Coal Power Initiative Workshop | | Fall/Winter 2003: 15 |
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| • New Projects Join CCPI | | Spring 2005: 6 |
| • Ribbon Cutting Milestone for the CCPI Lignite Fuel Enhancement Project | | Fall 2005: 13 |
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| • Progress Under Two Clean Coal Funding Vehicles | | Winter 2001: 7 |
| • First PPII Projects Successfully Negotiated | | Fall/Winter 2002: 4 |
| • Two New PPII Projects Move Forward | | Summer 2003: 8 |

— CLEAN COAL TECHNOLOGY DEMONSTRATION PROGRAM —**– Advanced Electric Power Generation – Advanced Combustion/Heat Engines –****Coal-Fueled Diesel Engine Demonstration Project***TIAX (formerly Arthur D. Little, Inc.)*

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| • Five New Clean Coal Projects: Demonstration of Clean Coal Diesel Technology at Easton Utilities | | Spring 1993: 3 |
| • Coal-Fueled Diesel Demonstration Project Re-Sited to Alaska | | Fall 1996: 14 |
| • Coal-Fueled Diesel Engine Demonstration Given Go-Ahead for Alaska | | Winter 1997: 1 |
| • Coal-Fueled Diesel on Schedule for January 1999 Delivery to Fairbanks, Alaska | | Winter 1998: 6 |

Healy Clean Coal Project*Alaska Industrial Development and Export Authority*

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| • Healy Celebrates a Successful Groundbreaking | | Summer 1995: 1 |
| • Progress and Achievements | | Fall 1995: 4 |
| • Healy Clean Coal Project Provides Power & Environmental Benefits | | Fall 1998: 1 |

Warren Station Externally Fired Combined-Cycle Demonstration Project*Pennsylvania Electric Company*

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| • Five New Clean Coal Projects: Warren Station EFCC Demonstration Project | | Spring 1993: 3 |
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– Advanced Electric Power Generation – Fluidized-Bed Combustion –**ACFB Demonstration Project***JEA*

- Large-Scale Atmospheric Circulating Fluidized-Bed Combustion Technology Winter 1997: 2
- JEA's Large-Scale CFB Demonstration Project Near Construction Peak Spring 2001: 1
- Powerplant Award, Multiple Visits Precede JEA Dedication Fall/Winter 2002: 1
- JEA Successfully Completes World's Largest CFB Demonstration Fall 2005: 4

Circulating Fluidized-Bed (CFB) Project*Colorado-Ute Electric Association*

- Colorado Fluid Bed Project Yields Both Power and Data Winter 1990: 1

McIntosh Unit 4A PCFB Demonstration Project*Lakeland Electric*

- Two PCFB Projects Re-Sited to Lakeland, Florida Winter 1996: 3

Four Rivers Energy Modernization Project [Novated to McIntosh Unit 4A PCFB Demonstration Project]*Four Rivers Energy Partners, L.P.*

- Five New Clean Coal Projects: Calvert City Advanced Energy Project Spring 1993: 2
- Two PCFB Projects Re-Sited to Lakeland, Florida Winter 1996: 3

McIntosh Unit 4B Topped PCFB Demonstration Project*Lakeland Electric*

- Two PCFB Projects Re-Sited to Lakeland, Florida Winter 1996: 3

Nucla CFB Demonstration Project*Tri-State Generation and Transmission Association, Inc.*

- Progress and Achievements Fall 1995: 4

PCFB Demonstration Project [Novated to McIntosh Unit 4B Topped PCFB Demonstration Project]*DMEC-1 Limited Partnership*

- Des Moines, Iowa Greets New Clean Coal Plant Fall 1991: 5
- Two PCFB Projects Re-Sited to Lakeland, Florida Winter 1996: 3

Tidd PFBC Demonstration Project*The Ohio Power Company*

- Tidd Plant Produces Power: Operations Planned Early 1991 Winter 1990: 5
- Tidd Receives 1991 Power Plant Award Spring 1991: 7
- Tidd Plant Resumes Operation Winter 1991: 3
- Tidd Plant Sets New Technical Operations and Environmental Performance Records Summer 1992: 4
- Tidd Extended Runs Verify Design Basis Fall 1992: 5
- Tidd Sets Mark with Continuous 45-Day Run Summer 1994: 4
- Tidd Concludes Four-Year PFBC Test Program Summer 1995: 5
- Progress and Achievements Fall 1995: 4

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– Advanced Electric Power Generation – Integrated Gasification Combined-Cycle –**Combustion Engineering IGCC Repowering Project***ABB Combustion Engineering, Inc.*

- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:
Six Major Projects in DOE's CCT Program Spring 1992: 1

Kentucky Pioneer Energy IGCC Demonstration Project (formerly Clean Energy Demonstration Project)*Kentucky Pioneer Energy, LLC*

- Five New Clean Coal Projects: Camden Clean Energy Project Spring 1993: 2
- Clean Energy Demonstration IGCC Project Progression Spring 1999: 1
- Kentucky Pioneer IGCC/Fuel Cell Project Underway Spring 2003: 5

Piñon Pine IGCC Power Project*Sierra Pacific Power Company*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition Fall 1991: 3
- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:
Six Major Projects in DOE's CCT Program Spring 1992: 3
- Progress and Achievements Fall 1995: 4
- Piñon Pine IGCC Plant Construction on Schedule Summer 1996: 1
- Second Generation Coal Gasification Technology: Startup and Operations Phase in Piñon
Pine IGCC Project Summer/Fall 1997: 5
- IGCC – A Glimpse Into the Future Spring 1998: 1

Tampa Electric Integrated Gasification Combined-Cycle Project*Tampa Electric Company*

- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:
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- Florida Project Demonstrates Key Technologies Spring 1993: 4
- Tampa Electric's Greenfield IGCC Ready for Demonstration Winter 1996: 1
- Two CCT Technologies Win Industry Awards Summer/Fall 1997: 16
- IGCC – A Glimpse Into the Future Spring 1998: 1

Toms Creek IGCC Demonstration Project*TAMCO Power Partners*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition Fall 1991: 3
- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:
Six Major Projects in DOE's CCT Program Spring 1992: 3

Wabash River Coal Gasification Repowering Project*Wabash River Coal Gasification Repowering Project Joint Venture*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition Fall 1991: 3
- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:
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- Promise of Coal Gasification Power Draws 400 Representatives to Wabash River Site Summer 1993: 4

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• Wabash Plant Begins Operating		Spring 1996: 1
• Wabash Wins Powerplant Award		Spring 1997: 7
• IGCC – A Glimpse Into the Future		Spring 1998: 1
• Wabash Completes Fourth Year of Commercial Operation		Spring 2000: 1

– Coal Processing for Clean Fuels –**Advanced Coal Conversion Process Demonstration***Western SynCoal LLP*

• Montana Plant to Open New Markets for Plentiful Low-Rank Coals		Fall 1991: 4
• Birth of a New Industry: SynCoal® Burn Tests Spawn Commercial Studies		Winter 1993: 1
• Progress and Achievements		Fall 1995: 4
• Rosebud Recruits Customers for Upgraded Coals		Fall 1999: 8

Commercial-Scale Demonstration of the Liquid-Phase Methanol (LPMEOH™) Process*Air Products Liquid Phase Conversion Company, L.P.*

• Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle: Six Major Projects in DOE's CCT Program		Spring 1992: 3
• Site Chosen for Coal to Methanol Energy Project		Winter 1993: 5
• LPMEOH™ Demonstration to Start Up in the Fall		Spring 1996: 10
• LPMEOH™ Demonstration Produces First Methanol From Coal		Summer/Fall 1997: 1
• LPMEOH™ Demonstration Project Completes First Year of Operation		Summer 1998: 6
• LPMEOH™ Project Performs Well During Second Year of Operation		Summer 1999: 1
• LPMEOH™ Demonstration Project Conducts Product-Use Study		Summer 2000: 1
• Clean Coal Technology Commercially Producing Methanol from Coal		Summer 2003: 12

Cordero Coal Upgrading Demonstration Project*Cordero Mining Company*

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Development of the Coal Quality Expert*ABB Combustion Engineering, Inc., and CQ Inc.*

• Clean Coal Project Will Develop Expert Computer Software Program		Winter 1991: 6
• CQ Inc. Software Tool Eases Utility Decision-Making		Fall 1996: 1

ENCOAL® Mild Gasification Project*ENCOAL® Corporation*

• ENCOAL® Mild Gasification Project Breaks Ground in Many Ways		Spring 1991: 6
• ENCOAL® Project Continues Rapid Pace: Spring 1992 Plant Startup Expected		Winter 1991: 1
• ENCOAL® Plant Starting Up		Summer 1992: 4

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- ENCOAL® Project Resumes Operation **Winter 1993: 8**
- ENCOAL® Plant Enters Production Mode **Summer 1994: 7**
- Progress and Achievements **Fall 1995: 4**
- ENCOAL® Mild Coal Gasification Project Completes Final Reports **Spring 1998: 5**

Self-Scrubbing Coal™: An Integrated Approach to Clean Air*Custom Coals International*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**
- Custom Coals Nears Completion **Summer 1995: 4**
- Progress and Achievements **Fall 1995: 4**
- Materials Technology for Ultra-Supercritical Plants **Spring 2002: 3**

– Environmental Control Devices – SO₂ Control Technologies –**10-MWe Demonstration of Gas Suspension Absorption***AirPol, Inc.*

- AirPol Plant Runs Smoothly: Early Tests Show High SO₂ Removals **Winter 1992: 1**

Advanced Flue Gas Desulfurization Demonstration Project*Pure Air on the Lake, L.P.*

- Pure Air Flue Gas Project Construction Well Advanced **Spring 1991: 1**
- Pure Air FGD Scrubber Begins Operations: Indiana Utility Leads Nation in Clean Air Act Compliance **Summer 1992: 5**
- Clean Coal Project Wins Outstanding Achievement Award **Winter 1992: 3**
- Pure Air Project Helps Hurricane Relief Efforts **Winter 1992: 3**
- Continued Success with Landmark Pure Air Project **Summer 1994: 1**
- Progress and Achievements **Fall 1995: 4**
- Pure Air Project Completed **Fall 1996: 8**

Demonstration of Innovative Applications of Technology for the CT-121 FGD Process*Southern Company Services, Inc.*

- Fiberglass Reinforced Plastic Highlights CT-121 “Second Generation” Wet Scrubber **Summer 1991: 2**
- Outperforming Conventional Systems: CT-121 Advanced Scrubber Moves Ahead at Georgia Site **Summer 1993: 1**

Demonstration of the Union Carbide CANSOLV System at the ALCOA Generating Corporation Warrick Power Plant*Union Carbide Chemicals and Plastics Company, Inc.*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**

LIFAC Sorbent Injection Desulfurization Demonstration Project*LIFAC–North America*

- LIFAC Process Tests Now Underway **Winter 1992: 4**
- LIFAC Nearing Marketability **Spring 1996: 7**

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– Environmental Control Devices – NO_x Control Technologies –**Demonstration of Advanced Combustion Techniques for a Wall-Fired Boiler***Southern Company Services, Inc.*

- Wall-Fired Boiler Low NO_x Overfire Air Tests Complete Spring 1991: 3
- Georgia Power's Plant Hammond Previews Clean Air Act's NO_x Challenges Winter 1991: 4
- Progress and Achievements Fall 1995: 4
- GNOCIS Software Commercializing Globally Summer/Fall 1997: 3

Demonstration of Coal Reburning for Cyclone Boiler NO_x Control*The Babcock & Wilcox Company*

- Cyclone Boiler Coal Reburn Technology Cuts NO_x by More Than 50 Percent Spring 1992: 6
- Coal Reburn Exceeds Expected NO_x Reductions: Control Option for High NO_x Emitting Cyclone Boilers Demonstrated Spring 1993: 6

Demonstration of Selective Catalytic Reduction Technology for the Control of NO_x Emissions from High-Sulfur-Coal-Fired Boilers*Southern Company Services, Inc.*

- Catalyst Suppliers Selected in Southern Company's SCR Project Summer 1991: 7
- SCR Holds Promise for Effective NO_x Control: CCT Projects Address Higher Costs, Limited U.S. Experience Summer 1992: 2
- SCR Tests Progress at Gulf's Plant Crist Summer 1993: 7
- Progress and Achievements Fall 1995: 4
- SCR Successes: Catalyst Performance & NO_x Reduction Fall 1996: 10

Evaluation of Gas Reburning and Low-NO_x Burners on a Wall-Fired Boiler*General Electric Energy and Environmental Research Corporation*

- EER's Gas Reburning: Low-NO_x Burner Technologies Reducing NO_x Emissions Winter 1992: 6
- EER Completes Three Demonstration Tests (Cherokee Station Unit 3) Summer 1995: 6
- Site Tour: Cherokee Station Unit 3 Fall 1995: 3
- Two CCT Technologies Win Industry Awards Summer/Fall 1997: 16

Full-Scale Demonstration of Low-NO_x Cell Burner Retrofit*The Babcock & Wilcox Company*

- B&W Low-NO_x Cell Burners Fabricated Spring 1991: 7
- B&W Low-NO_x Cell Burner Tests Under Way Summer 1992: 6
- Two CCT Projects "Get the Word Out:" Low-NO_x Cell Burner Project and NOXSO SO₂/NO_x Removal Project Spring 1993: 8
- Clean Coal Program Marks First Commercial Success with Sale of Low-NO_x Technology Summer 1993: 6

Micronized Coal Reburning Demonstration for NO_x Control on a 175-MWe Wall-Fired Unit*New York State Electric and Gas Corp.*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition Fall 1991: 3

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Selective Catalytic Reduction Project (Plant Crist, Pensacola, FL)*Southern Company Services Inc.*

- SCR Holds Promise for Effective NO_x Control: CCT Projects Address Higher Costs, Limited U.S. Experience Summer 1992: 1
- Gulf Power's SCR Test Facility in Operation (Defining SCR Catalysts for U.S. High Sulfur Coals) Spring 1994: 4

– Environmental Control Devices – Combined SO₂/NO_x Control Technologies –**Commercial Demonstration of the NOXSO SO₂/NO_x Removal Flue Gas Cleanup System***NOXSO Corporation*

- Two CCT Projects “Get the Word Out:” Low-NO_x Cell Burner Project and NOXSO SO₂/NO_x Removal Project Spring 1993: 8
- Financing and Opt-In Regulations Assist NOXSO Spring 1996: 5

Enhancing the Use of Coals by Gas Reburning and Sorbent Injection*General Electric Energy and Environmental Research Corporation*

- Gas Reburning Tests Begin at Illinois Power Plant: Early Tests Exceed Expectations Summer 1991: 1
- Gas Reburning Emerging as Cost-Effective Nitrogen Oxide Reduction Technique Spring 1992: 4
- EER Completes Three Demonstration Tests (Hennepin Station Unit 1 and Lakeside Station Unit 7) Summer 1995: 6
- Two CCT Technologies Win Industry Awards Summer/Fall 1997: 16

Integrated Dry NO_x/SO₂ Emissions Control System*Public Service Company of Colorado*

- Second Colorado Project Also Opening: PSCC Tests Integrated NO_x/SO₂ Emissions Control System Winter 1992: 7
- Site Tour: Arapahoe Station Unit 4 Fall 1995: 3

LIMB Demonstration Project Extension and Coolside Demonstration*The Babcock & Wilcox Company*

- B&W's LIMB Operating; Coolside Tests Complete Winter 1990: 3

Milliken Clean Coal Technology Demonstration Project*New York State Electric & Gas Corporation*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition Fall 1991: 3
- Total Environmental and Energy Management: Milliken Project in Final Construction Stage Summer 1994: 6
- Progress and Achievements Fall 1995: 4
- Milliken Clean Coal Project Under Way Summer 1996: 4
- Milliken CCT Demonstration Project Nears Completion Summer 1999: 5

SNOX™ Flue Gas Cleaning Demonstration Project (Formerly Ohio Edison, Niles Station)*ABB Environmental Systems*

- WSA-SNOX™ Offers Multiple Pollutant Capture, Efficiency, Salable By-Products Fall 1991: 6
- SNOX™ Demonstration on Line Winter 1991: 3
- SCR Holds Promise for Effective NO_x Control: CCT Projects Address Higher Costs, Limited U.S. Experience (SNOX™) Summer 1992: 1

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SO_x-NO_x-Rox Box™ Flue Gas Cleanup Demonstration Project*The Babcock & Wilcox Company*

- Success is in the Ceramic Bag: B&W's SO_x-NO_x-Rox Box™ Starts Up **Spring 1992: 6**
- SCR Holds Promise for Effective NO_x Control: CCT Projects Address Higher Costs, Limited U.S. Experience (SNRB) **Summer 1992: 2**
- Progressive Technology Exceeds Expectations **Summer 1993: 3**

– Industrial Applications –**Advanced Cyclone Combustor with Internal Sulfur, Nitrogen, and Ash Control***Coal Tech Corporation*

- Coal Tech Completes Combustor Operations **Winter 1990: 4**

Blast Furnace Granulated-Coal Injection System Demonstration Project*Bethlehem Steel Corporation*

- Bethlehem on Schedule for Early 1995 Startup: Blast Furnace Coal Facility in Construction **Spring 1994: 2**
- Progress and Achievements **Fall 1995: 4**
- Cleaner Iron-Making Process in Full-Scale Testing **Summer 1996: 6**
- Bethlehem Steel Successfully Completes Demonstration **Winter 1999: 1**

Cement Kiln Flue Gas Recovery Scrubber*Passamaquoddy Tribe*

- Passamaquoddy Cement Kiln Project Begins Operations **Spring 1991: 4**
- Success Continued at Cement Kiln Project **Fall 1992: 6**

Clean Power from Integrated Coal/Ore Reduction (COREX®)*Centerior Energy Corporation*

- Five New Clean Coal Projects: Clean Power from Integrated COREX®-CPICOR™ Process **Spring 1993: 3**
- CPICOR™ Project Awarded **Winter 1996: 6**

Demonstration of Pulse Combustion in an Application for Steam Gasification of Coal*ThermoChem, Inc.*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**
- ThermoChem, Inc. CCT-IV Project Revised **Winter 1998: 10**

Innovative Coke Oven Gas Cleaning System for Retrofit Applications*Bethlehem Steel Corporation*

- Bethlehem Steel's Innovative Cleanup System Nears Completion at Sparrows Point **Summer 1991: 4**