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[Clean Air Marketplace] [Loose] [3]

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THE CLEAN AIR MARKETPLACE 1993

September 1993

Draft Conference Prospectus

The U.S. Environmental Protection Agency (EPA) and the Air and Waste Management Association (AWMA) are sponsoring the **Clean Air Marketplace 1993 Conference and Exhibit**, planned for September 8-10, 1993 in Washington, D.C. This event, a reprise of a conference of the same name held in April 1992, will provide a unique opportunity to explore the new business opportunities and markets created by the Clean Air Act Amendments of 1990 (CAA). The **Clean Air Marketplace 1993** will bring leading business executives together with the key federal officials responsible for implementing the CAA, top-level state and local officials, and others with an interest in examining the linkage between a clean environment and a healthy economy.

The **Clean Air Marketplace 1993** will provide an opportunity for representatives of firms affected by CAA provisions to meet and discuss their needs with their counterparts from companies that provide CAA compliance technologies and services. This opportunity will be heightened by an expanded new technologies exhibition that will be open throughout the conference.

In addition to vendors and users of pollution control equipment, the conference will be of interest to regional and local economic development authorities, federal, state, and local policymakers, trade union representatives, financial institutions and analysts, and individuals associated with the expanding international market for pollution control technology and services.

Conference sessions will focus on a wide variety of important themes:

- The vital linkage between the Clean Air Act, new business opportunities, and enhanced international competitiveness and export opportunities
- The status of Clean Air Act implementation
- The role of all levels of government in supporting the Clean Air Marketplace, including the important role of economic incentive programs
- The status of the marketplace in specific areas such as stationary source technology, mobile source technology, air pollution control services, pollution prevention,

DRAFT -- February 1, 1993

and financing for new business opportunities and pollution control investments

In addition to panels of industry and government leaders discussing these important themes, the Clean Air Marketplace 1993 conference will feature major speakers throughout the two-day conference program. Vice President Gore is the potential keynote speaker for lunch on the first day. Potential speakers for other plenary conference sessions include Carol Browner, the new EPA Administrator; Senator George Mitchell (D-ME); other incoming Cabinet officials; and leading CEOs in the environmental industry, such as William Ruckelshaus.

For more information about the Clean Air Marketplace 1993 conference, call Steve Harper of EPA at 202-260-8953. If you want to be put on the mailing list for a conference brochure (when it's available), leave a message at 703-934-3747.

The following is a preliminary schedule of conference sessions:

DAY 1¹

8:30 - 9:30 a.m.

WELCOMING REMARKS

- Assistant Administrator of Office of Air and Radiation
- Martin Rivers, Executive VP, AWMA
- Honorable Carol M. Browner, Administrator, U.S. EPA

9:45 - 11:45 a.m.

Session 1: Clean Air Act/Jobs/Competitiveness/Exports

Speaker: Michael Porter or Laura Tyson or Robert Reich

and/or

Panel (*include Jeff Smith reporting on EPA/ICAC Title IV job creation study*)

¹All speaker names are tentative; no invitations have been issued at this time.

12:00 - 1:30 p.m.

LUNCHEON

Speaker: Vice President Gore

1:45 - 3:45 p.m.

Session 2: Stationary Source Technologies and Services

(include pollution prevention panelists)

(include monitoring and instrumentation in each)

- Panel A: Utility technologies *(include renewables)*
- Panel B: VOC technologies
- Panel C: Air toxics technologies
- Panel D: NOx control technologies
- Panel E: Utility services *(include demand-side management, energy conservation retrofits and new construction)*

Session 3: Mobile Source Technologies and Services

- Panel A: CAAA/ISTEA/Energy Act interactions *(emphasize incentives in acts for development and commercialization of new technologies)*
- Panel B: Auto emissions technology
- Panel C: Alternative fuels technology
- Panel D: Heavy vehicle controls
- Panel E: Alternative transportation modes
- Panel F: Vehicular emissions-related services *(e.g., I/M training and maintenance work, trip-reduction program consultants)*

4:00 - 6:00 p.m.

Session 4: Role of the Government in Supporting the Clean Air Marketplace

- Panel A: Federal, state, and local regulatory programs *(include discussion of economic incentives program, RECLAIM)*
- Panel B: Technology transfer, training, education *(include ORD and DOE national labs reps; include focus on helping small cos.)*
- Panel C: Export promotion *(have gov't folks id. what's*

being done; someone from ICAC talk about what's not being done; reps from Germany and Japan to talk about what they are doing)

Session 5: Financing

(include speakers who can focus on financing different stages of product development -- start-up, R&D, commercialization)

Panel A: Financing pollution control projects
Panel B: Financing environmental companies
Panel C: Financing exports

7:00 - 8:30 p.m.

DINNER

Speaker: The Honorable Senator George Mitchell

DAY 2

8:00 - 8:30 a.m.

OPENING REMARKS

Speaker: OAR Deputy Assistant Administrator Shapiro

8:45 - 10:45 a.m.

Session 6: Clean Air Act Implementation Roundtable

6-8 person panel, including

- Key OAR staff
- Few State/local speakers (*Bill Becker and Jim Lents?*)
- Several Hill staffers
- Private sector folks
- Environmental group reps.

11:00 a.m. - 12:45 p.m.

Session 7: The Global Clean Air Marketplace: Export Opportunities

Panel of reps. of companies with success stories

Session 8: Pollution Prevention under the Clean Air Act

(include speakers who can talk about P2 aspects of CAAA as well as those who can talk about technologies)

1:00 - 2:30 p.m.

LUNCHEON

Speaker: Industry CEO (suggest Chairman and CEO of So.Cal. Edison)

2:45 p.m. - 4:45 p.m.

Session 9: Looking to the Future: Pollution Prevention, Environmentally Critical Technologies, and the Need for a Technological Transformation

Speaker: Gus Speth, followed by a panel

Session 10: The role of small companies in the Clean Air Marketplace

(panel of successful small cos. and gov't folks to talk about what assistance is available at Fed. and state level)

CLEAN AIR MARKETPLACE DATABASE
US EPA OFFICE OF AIR AND RADIATION

Sort Order:

Main Category
Project Type 1
Unique ID

Index Number: 1
Unique ID: 000319
Main Category: AIR TOXICS
Projects Type(s): benzene control
Location(s): Sauget, IL, 05 U.S.A.
Companies: Monsanto
Date: 11/06/92

Monsanto reduced the emissions of paradichlorobenzene by 36% at its Sauget, IL, plant by installing a closed process that reuses the chemical. Emissions from the facility reportedly have been virtually eliminated. (Chemical Marketing Reporter, 11/6/92, p. SR21)

Index Number: 2
Unique ID: 000088
Main Category: AIR TOXICS
Projects Type(s): biological technology
Location(s): Belle Mead, NJ, 02 U.S.A.
Companies: Earth Safe Industries, Inc.
Date: / /

Earth Safe Industries, Inc. of Belle Mead, NJ is developing a non-toxic biological preservative intended to replace formaldehyde, which is a major component of most biological preservatives and a toxic air pollutant. Sixty-seven billions pounds of this substance are reportedly produced in the US annually. Earth Safe Industries intends to demonstrate the effectiveness of its product, NoToX, in eliminating air pollution associated with the release of formaldehyde and acting as an effective, long-term preservative and fixative. (EPA Announcement of Small Business Pollution Prevention Grants awarded)

Index Number: 3
Unique ID: 000098
Main Category: AIR TOXICS
Projects Type(s): catalytic technology
VOCs
coatings/paints/plating
printing
Location(s): , , U.S.A.
Companies: W.R. Grace & Company

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Date: 04/23/92

W.R. Grace & Co. is commercializing a new water printing plate to reduce volatile organic compounds (VOCs) for the graphic arts industry. Grace is also developing a container-sealing product that is reformulated to a water-based compound and reduces the use of organic solvents; water-based photopolymers for printed circuit boards; fluid-cracking catalysts that have been redesigned to reduce process emissions; and silica-based coating materials that are reformulated for VOC paints. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 4
Unique ID: 000099
Main Category: AIR TOXICS
Projects Type(s): catalytic technology
SO2 control
NOx control
VOCs
Location(s): , , U.S.A.
Companies: W.R. Grace & Company
Date: 04/22/92

W.R. Grace & Co. has "tech" systems, such as thermal and catalytic oxidation systems for reducing VOCs in industrial processes. The Snyox Ceramic Honeycomb catalysts developed by Grace provide NOx reduction over a wide range of flue gas conditions. Noxso is a dry, dual pollutant removal technology that removes both NOX and SOX with a high removal efficiency rate and virtually no solid waste by-products. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 5
Unique ID: 000121
Main Category: AIR TOXICS
Projects Type(s): catalytic technology
VOCs
Location(s): , , U.S.A.
Companies: Catalytica
Environmental Protection Agency
Date: 03/31/91

Catalytica has finished Phase I of an EPA SBIR grant demonstrating the technical feasibility of its absorption-catalytic combustion system for eliminating VOCs. Catalytica is looking for a Phase III commercial scale-up partner in 1992. In this system, VOCs are catalytically oxidized to produce carbon dioxide and water vapor. (Inside R&D, 3/31/91)

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Index Number: 6
Unique ID: 000324
Main Category: AIR TOXICS
Projects Type(s): catalytic technology
trichloroethylene (TCE)
Location(s): London, , Canada
Companies: Purdue University
Nutech Environmental
Date: 11/01/92

Researchers from Purdue University reported that three levels of trichloroethylene (TCE) in air were reduced below a practical quantification limit of 0.02 ug/l during experiments with a laboratory photocatalytic reactor. In experiments in which the TCE was carried in nitrogen gas and oxygen and water vapor was absent, TCE degradation also occurred suggesting that TCE destruction may be initiated by direct attack of photogenerated "holes". Field-scale tests of the photocatalytic reactor in Nutech Environmental Co., London, Ontario, on contaminated air from a soil vapor extraction system, reduced TCE levels. (AirTECH News, 11/92, p. 154)

Index Number: 7
Unique ID: 000087
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
Location(s): El Monte, CA, 09 U.S.A.
Companies: Crown City Plating
Date: / /

Crown City Plating of El Monte, CA is reformulating a buffering compound for zinc diecast, brass, and other metals that are typically polished and buffed prior to the application of electroplates or paints. Buffing and polishing compound is generally formulated with magnesium stearate as the grit support medium and lubricant that is not water-soluble and therefore requires either vapor degreasing with chlorinated solvents or a diphase petroleum oil-water cleaning method for removal. Crown City Plating will investigate the substitution of magnesium stearate by a water-soluble, high molecular weight polyethylene glycol material to reduce emissions of toxic air pollutants. (EPA Announcement of Small Business Pollution Prevention Grants awarded)

Index Number: 8
Unique ID: 000089
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating

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VOCs
filters/traps
recycling
Location(s): Freemont, CA, 09 U.S.A.
Companies: Global Plating, Inc.
Date: / /

Global Plating, Inc. of Freemont, CA, a full-service plating and anodizing job shop, proposes to recover zinc chloride and other chemicals used in zinc plating through ultrafiltration and reverse osmosis membranes technologies. These technology is expected to reduce the amount of hazardous waste generated, remove chlorides from the waste water, and permit reuse of reclaimed chemicals. Global Plating projects a 70-80 percent chemical recovery rate using this technology. (EPA Announcement of Small Business Pollution Prevention Grants awarded)

Index Number: 9
Unique ID: 000090
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
Location(s): Fort Collins, CO, 08 U.S.A.
Companies: IonEdge Corporation
Date: / /

IonEdge Corporation of Fort Collins, CO will study the dry plating of cadmium, zinc, and zinc-cadmium alloys that were developed as an alternative to cadmium plating in cyanide baths. This novel technique minimizes hazardous waste, occupational exposure, and the release of cadmium into the environment by components in-use or discarded components. The lubricity of the dry plated alloy will be measured in terms of the coefficient of friction, and compared to that of the electroplated cadmium. If the dry plated alloy is of comparable lubricity, it would then replace cadmium plating in cyanide baths. (EPA Announcement of Small Business Pollution Prevention Grants awarded)

Index Number: 10
Unique ID: 000091
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
 VOCs
Location(s): , , U.S.A.
Companies: Chrysler Corporation
Date: 08/24/92

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Chrysler Corp. has developed an E-Coat Primer that is water-based and result in no emissions of VOCs. The primer will be used on Chrysler's new line of LH cars. (Automotive News, 8/24/92, p. 24LH)

Index Number: 11
Unique ID: 000092
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
dryers
Location(s): Los Angeles, CA, 09 U.S.A.
Companies: Southern California Edison
Date: 08/16/91

Southern California Edison, the electricity supplier to Los Angeles, has developed new water-based solvents that can be used to coat wooden products such as golf-clubs and electric guitars, as well as a clean way of drying them with infra-red heat. (Economist, 8/16/91, pp. 79-80)

Index Number: 12
Unique ID: 000093
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): , , U.S.A.
Companies: Lord Corporation
Date: 08/03/92

Lord Corp. has developed a rubber-to-metal adhesive called Chemlok 855 to replace the adhesives which emit VOC's. Chemlok 855 is a waterborne one-coat adhesive system which is equal in performance to commercially available solvent-based one-coat adhesives. (Rubber and Plastics News, 8/3/92)

Index Number: 13
Unique ID: 000094
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): , , U.S.A.
Companies: Rohm and Haas
Date: 07/27/92

Rohm and Haas is introducing Emulsion 2931, a vinyl acetate and acrylic co-polymer that is targeted for case and carton sealing applications. The

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emulsion can be used on a variety of substances, such as films and metalized surfaces, and reduces VOC emissions. (Chemical Marketing Reporter, 7/27/92)

Index Number: 14
Unique ID: 000095
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
filters/traps
Location(s): Spring Hill, TN, 04 U.S.A.
Companies: Saturn Corporation
Date: 07/27/92

Saturn Corp. has invested \$25 million in changing paint-shop technology at its Spring Hill, TN, plant, including the installation of a new carbon absorption system that is expected to reduce emissions by one-third. The carbon absorption system removes airborne solvents by passing paint shop exhaust through a filter of carbon traps. (Automotive News, 7/27/92, p. 20)

Index Number: 15
Unique ID: 000100
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): , , U.S.A.
Companies: Glidden Paint Corporation
Date: 04/22/92

Glidden Paint Corporation has focused on the control of VOC emissions from architectural and consumer paints and has developed two new lines of interior latex paint that are formulated without the use of solvents and are VOC-free. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 16
Unique ID: 000114
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): , CA, 09 U.S.A.
, MI, 05 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
Southern California Edison
California Furniture Manufacturers Association
Battelle Columbus Laboratories

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Date: Coating Research Institute
10/01/91

The South Coast Air Quality Management District (SCAQMD) in California, has funded several research projects to develop new types of coatings that produce no pollution and have minimal environmental impact. SCAQMD has enlisted the California Furniture Manufacturers Association, Southern California Edison, and Battelle Columbus Labs to develop ultraviolet (UV)-curable coatings for wood furniture. Battelle has successfully developed a high-quality, pollution-free, UV-curable basecoat and is working on a topcoat. SCAQMD is also working with the Coating Research Institute of Eastern Michigan University, the Michigan Research and Development Fund, Paint Research and Associates, and the Agency for International Development to develop zero-VOC coating that uses vernonia plant oil as a base. (Modern Paint and Coatings, 10/91)

Index Number: 17
Unique ID: 000115
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): , , U.S.A.
Companies: Pennsylvania House
Union Carbide
Nordson Corporation
Guardsman Products Inc.
Plastics Company Inc.
Date: 10/01/91

Pennsylvania House has begun full-scale production using a revolutionary new spray finishing system designed to apply high solids coatings with fewer VOCs. Pennsylvania House is the first manufacturer in any industry to market a product that was in part finished with the Unicarb System, developed by Union Carbide Chemicals and Plastics Co. Inc. The project incorporates spray equipment developed by Nordson Corp. and lacquers specially formulated for the process by Guardsman Products Inc. The system represents a new technological alternative for reducing emissions of VOCs in spray finishing operations. The finish is mixed with carbon dioxide and conditioned to the right temperature and pressure for delivery to the spray gun. Pennsylvania House estimates that VOC emissions have been reduced by about 70 percent with the new spray system. (Wood & Wood Products, 10/91)

Index Number: 18
Unique ID: 000116
Main Category: AIR TOXICS

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Projects Type(s): coatings/paints/plating
VOCs
Location(s): San Jose, CA, 09 U.S.A.
San Francisco, CA, 09 U.S.A.
Companies: Metropolitan Furniture Corporation
Bay Area Air Quality Management District (BAAQMD)
Date: 10/01/91

Metropolitan Furniture Corporation manufactures high-end office furniture and has plants in both San Jose and San Francisco, California. Both facilities fall under the local jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which has proposed increasingly strict VOC limits for 1992, 1994, and 1996. As a result, Metropolitan Furniture made a high priority of finding low VOC finishes that matched or exceeded the quality of its existing finishes. Metropolitan has also updated its spray equipment with air-assisted airless and high-volume, low-pressure spray equipment. (Wood & Wood Products, 10/91)

Index Number: 19
Unique ID: 000118
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): Mars, PA, 03 U.S.A.
Companies: Allegheny Metalworking
Date: 04/22/91

Allegheny Metalworking in Mars, PA, which paints a large number of metal parts and cabinets, took steps to limit VOC emissions by employing a painting system that uses a high volume of paint under low pressure to reduce the amount of excess paint, known as over-spray, going into the air. (Pittsburgh Business Times, 4/22/91, p. 1)

Index Number: 20
Unique ID: 000122
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): Freeport, TX, 06 U.S.A.
Companies: Dow Chemical Company
Date: 12/24/90

Dow is expanding its Freeport, TX, glycidyl methacrylate facility. GMA is a reactive monomer used in coatings to reduce the solvents content. The

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expansion, due to be completed in 1991, will position Dow as the major supplier of GMA in the United States. (Plastics News, 12/24/90)

Index Number: 21
Unique ID: 000124
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
printing
Location(s): Atlanta, GA, 04 U.S.A.
Companies: Mead Corporation
Date: / /

The Mead Packaging Division of the Mead Corp., based in Atlanta, GA, is a leading manufacturer of paperboard packaging for the beverage and food industries. Mead Packaging has been able to reduce its emissions of VOCs by more than 85 percent in the last 15 years by substituting water-based inks and coatings for solvent-based inks previously used in the printing process. This pollution prevention step has resulted in the elimination of thousands of tons of air emissions annually from non-attainment areas. In addition to reducing VOC emission from its U.S. plants, Mead has helped its customers (other printers) experience similar reductions by selling its water-based inks and varnishes. (EPA Office of Pollution Prevention)

Index Number: 22
Unique ID: 000125
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): Warminster, PA, 03 U.S.A.
Companies: U.S. Navy
Date: / /

UNICOAT, developed by the Navy's Exploratory Development Program in Warminster, PA, is a single coating corrosion preventative developed to replace the traditional two-coat, primer and topcoat paint systems used on aircraft and in other industrial applications. The aircraft industry has recognized that UNICOAT provides a number of benefits, such as reduced VOC emissions; reduced application time and materials; less component degradation, malfunction, and maintenance; reduced paint removal time, materials, and effort. Efforts to develop a second generation UNICOAT are in progress. (EPA Office of Pollution Prevention)

Index Number: 23

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Unique ID: 000126
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
catalytic technology
printing
VOCs
Location(s): Pepperell, MA, 03 U.S.A.
Companies: Dec-E-Tech
Date: / /

Dec-E-Tech of Pepperell, MA has developed a line of catalytic incineration and solvent capture systems for the printing and coatings industries. The incineration systems can be used in either water-based or hydrocarbon-based coatings and inks, with a reported 95 percent minimum destruction efficiency. (EPA Office of Pollution Prevention)

Index Number: 24
Unique ID: 000310
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
Location(s): , , U.S.A.
Companies: UBC Radcure
Sartomer Inc.
Henkel Inc.
Union Carbide
Date: 09/01/92

Radiation curing (radcure) of paints, coatings, inks, and adhesives is reported to be a versatile alternative to other low-solvent or solvent-free products. Technology has been improved so that 3D UV or EB radiation systems can be used to cure coated objects, expanding the use of radcure to wood, paper, paperboard, leather, woven and non-woven fabrics, plastics, ceramics, glass, and ferrous and nonferrous metals, especially in automobiles. Radcure can also be used in adhesives, varnishes and protective coatings. Available sprayable radcure coating systems are alleged to have recovery rates of 99.5 to 99.9%. Radcuring is fast and low-heat allowing for high production line-speeds. Also, compatible unsaturated compounds that enhance adhesion, aid in pigment dispersion, retard scorch, improve abrasion resistance, contribute to flexibility and elasticity, or are effective as diluents are available. Radcure formulations initiated by cations have opened up new thin- and thick-film applications. Leading suppliers include UCB Radcure, Sartomer, Inc., Henkel, Inc., and Union Carbide Corp. (Chemical Business, 9/92, p. 23)

Index Number: 25
Unique ID: 000393

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Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
Location(s): , , U.S.A.
Companies: Miles
Date: 10/19/92

Miles has reportedly targeted polyurethanes and saturated polyester for water-based technical development. Its focus in polyurethanes is on polyurethane dispersion systems for a wide range of applications. It is working on developing a water-based polyurethane technology for refinishing wood flooring. The company has already developed resin for a waterborne primer for auto refinishing. In the saturated polyester field, Miles is focusing on dispersible unsaturated polyester products, especially high-performance furniture segments, such as office and kitchen. (Chemical Marketing Reporter, 10/19/92, p. SR32)

Index Number: 26
Unique ID: 000397
Main Category: AIR TOXICS
Projects Type(s): coatings/paints/plating
VOCs
Location(s): Salt Lake City, UT, 08 USA
Companies: EDO Performance Coatings
Date: 02/01/93

Using a thermal spray process, EDO Performance Coatings of Salt Lake City, UT, now offers commercial application of a variety of high performance thermoplastics as coatings. The process reportedly has no VOCs and requires no oven curing time. Thermoplastic coatings can be tailored to provide improved corrosion prevention; chemical resistance; lubricity with abrasion resistance; thermal, sound; and electrical insulation; and antifouling. (Oil and Gas Journal, 2/1/93, p. 48)

Index Number: 27
Unique ID: 000085
Main Category: AIR TOXICS
Projects Type(s): dryers
particulates
Location(s): Bend, OR, 10 U.S.A.
Companies: Production Machinery, Inc.
Date: / /

Production Machinery, Inc. of Bend, OR is conducting a project to determine if particulate emissions are reduced or eliminated when wood veneer is dried using Radio Frequency (RF) energy as opposed to conventional energy sources.

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Current dryers use natural gas, wood waste, or electric resistance heating in the direct or indirect heating of the veneers. The premise is that RF energy, attracted directly to the water in the wood, is able to heat the water and drive it from the wood cells at lower temperatures than are required by conventional dryers. Lower temperatures allow little or no release of hydrocarbons (smoke) from the wood compared to emissions generated from other types of dryers. (EPA Announcement of Small Business Pollution Prevention Grants awarded)

Index Number: 28
Unique ID: 000113
Main Category: AIR TOXICS
Projects Type(s): emissions controls (gen)
Location(s): Houston, TX, 06 U.S.A.
Companies: Hoechst Celanese
Date: 10/28/91

Hoechst Celanese has announced plans to reduce toxic air emissions by at least 70 percent over the next five years, at a cost of \$500 million nationally, including \$150 million to be spent on the company's four Houston locations. (Houston Business Journal, 10/28/91)

Index Number: 29
Unique ID: 000123
Main Category: AIR TOXICS
Projects Type(s): emissions controls (gen)
recycling
Location(s): Augusta, ME, 01 U.S.A.
Companies: Statler Tissue Company
Date: / /

The pollution prevention program instituted by Statler Tissue Co. of Augusta, ME, has eliminated the amount of hazardous and toxic materials used by the company. All of the goods manufactured by the company are produced from 100 percent recycled fibers. The program has allowed Statler to emit the lowest volume of toxic releases of any integrated tissue mill in the United States. (EPA Office of Pollution Prevention)

Index Number: 30
Unique ID: 000102
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
emissions credits/trade
VOCs

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Location(s): , , U.S.A.
Companies: Research-Cottrell
Date: 04/22/92

Continuous Emissions Monitoring (CEM) systems are important new technologies for facilitating emissions trading. For example, the Fourier Transformer Infrared analyzers (FTIR), supplied by Research-Cottrell, is an emissions monitoring technology for VOC emissions control. The FTIR is in increasing demand for reputedly being able to fingerprint chemicals based on the chemicals' emission/absorption of a particular light spectrum. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 31
Unique ID: 000104
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
Location(s): Deer Park, TX, 06 U.S.A.
Companies: Systems Applications International
Shell Oil Company
Date: 04/22/92

Addressing the need for new fugitive emissions control systems comprised of computer hardware and software designed for better data management and analysis to track fugitive emissions, Systems Applications International (SAI) collaborated with Shell's Deer Park, Texas Manufacturing Complex to develop a program that involves new hardware source tags. These source tags contain unique source identification numbers for each individual source, assigned to the source for its lifetime. Information about the source, such as manufacturer of the source, location of the source, leak definition, emissions history, and repair history, is associated with a particular source identification number making it easier to identify a source. New software reads the tag number and scans a list of source numbers to see if the source has been identified as needing monitoring. If so, concentrations from fugitive emissions are tested which the software program compares against the leak definition for that source. If the monitored emission exceeds the leak definition, then the software system directs the operator to make a number of repairs to that source. Thus the software system decreases the time required to locate the source, take the proper measurements, and make first attempts to repair the source. In addition, software has been developed for the mainframe that centrally stores all the information on the various sources allowing for across-the-board analyses of the equipment manufacturers, location of sources, or maintenance records. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 32

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Unique ID: 000109
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
Location(s): , , U.S.A.
Companies: Asea Brown Boveri, Inc.
Date: 01/10/92

Asea Brown Boveri, Inc. (ABB) is introducing to the US market OPSIS, a new technology which can help industries and utilities monitor all emissions for compliance with the CAA. OPSIS is a continuous self-monitoring system which can provide early warning for immediate detection of emissions patterns of up to 20 pollutants including sulfur and nitrogen oxides. OPSIS works by projecting a narrow beam of light over a predetermined path (from a few feet to 1.5 miles). Air pollutants absorb part of the light, while the remainder is collected by the receiver. Then a computerized spectrometer analyzes the type and quality of the pollutants in the measurement path. (Business and the Environment, 1/10/92)

Index Number: 33
Unique ID: 000119
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
Location(s): , , U.S.A.
Companies: Laser Sciences Inc.
NASA Jet Propulsion Laboratory
Date: 04/01/91

NASA's Jet Propulsion Laboratory (JPL) has developed and successfully tested a prototype of a moveable light detection and ranging (lidar) system that fits inside a semi-trailer. The CO laser manufactured by Laser Sciences Inc. shoots out of the opening of a trailer, can scan 360 degrees, and can detect gases at ranges of 5 km and aerosols at ranges of 10 km. Since the radar can move unannounced over highways, it could be the pollution police lab of the future. (Photonics Spectra, 4/91, pp. 76-8)

Index Number: 34
Unique ID: 000120
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
Location(s): Las Vegas, NV, 09 U.S.A.
Companies: Environmental Protection Agency
Date: 04/01/91

The US Environmental Protection Agency's Las Vegas research laboratory is experimenting with airborne lidar instruments which can track a cloud of

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contaminants as it drifts over a 100-mile range. This could allow investigators to detect the origin and destination of otherwise hard-to-track pollutants. This could serve to settle disputes over responsible parties for offensive airborne gases. (Photonics Spectra, 4/91, pp. 76-8)

Index Number: 35
Unique ID: 000394
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
Location(s): , ,
Companies: Air Instruments and Measurements Inc.
Date: 02/01/93

Air Instruments and Measurements Inc. has designed an open path air monitoring systems that provides perimeter monitoring for leaks, spills and other emissions of air pollutants. Applications of the system include long path ambient monitoring, landfill emissions monitoring, workplace atmospheric monitoring, and/or remote vehicle exhaust monitoring. The infrared analyzer projects a light beam across the space to be monitored, up to several hundred feet. Any of the monitored gases intercepting the light beam are detected, recorded, and if above preset limits, trigger an alarm. The equipment features automatic calibration, explosion-proof housing and, long-term unattended operation. (Oil and Gas Journal, 2/1/93, p. 48)

Index Number: 36
Unique ID: 000396
Main Category: AIR TOXICS
Projects Type(s): emissions monitoring
Location(s): Stafford, TX, 06 USA
Companies: Texas Analytical Controls
Date: 02/08/93

The new Model 101MSC H2S monitor, developed by Texas Analytical Controls Inc., of Stafford, TX, is designed for either stand-alone or systems applications and uses a "smart sensor" to provide accurate and reliable monitoring of hydrogen sulfide in ambient air. The system uses a built-in controller which reportedly provides full control at the sensor site, including alarm set point and LED readout of H2S. The instrument also features push button calibration, and is reportedly easy to install and operate. (Oil and Gas Journal, 2/8/93, p. 69)

Index Number: 37
Unique ID: 000112
Main Category: AIR TOXICS

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Projects Type(s): ethylene
benzene control
Location(s): Seadrift, TX, 06 U.S.A.
Institute, WV, 03 U.S.A.
Companies: Union Carbide
Dow Chemical Company
Monsanto
Date: 11/13/91

Union Carbide has cut benzene emissions by 20,000 lbs/year by changing the cleaning agent at its Seadrift, TX, plant. Similar substitutions were made at Dow and Monsanto. At Institute, WV, 672,000 lbs/year of SARA Title III emissions were cut by the installation of a new ethylene oxide distribution system that eliminated several hundred pumps, valves, and flanges. (Chemical Week, 11/13/91)

Index Number: 38
Unique ID: 000103
Main Category: AIR TOXICS
Projects Type(s): filters/traps
VOCs
biological technology
Location(s): , , U.S.A.
Companies: Research-Cottrell
Date: 04/22/92

Research-Cottrell has been exploring the use of biofiltration technology for controlling VOC emissions, as it has been used in Europe. There is some concern that the organisms involved will enter the environment. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 39
Unique ID: 000309
Main Category: AIR TOXICS
Projects Type(s): modeling (computer)
emissions monitoring
Location(s): Peoria, IL, 05 U.S.A.
Companies: Environmental Science and Engineering Inc. (ESE)
Environmental Protection Agency
Date: 08/13/92

EPA awarded a \$75 million contract to Environmental Science and Engineering Inc. (ESE), Peoria, IL, to develop the Clean Air Status Network (CASTnet). The network will be used to monitor the levels of CAAA hazardous air pollutants, as well as pollutants that cause ozone, acid deposition, acid

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aerosols and visibility problems. A nationwide baseline of rural pollution levels will be set up for comparison to urban levels. During the five year program, ESE plans to test innovative monitoring technologies, including a mobile platform or station that could be moved to different locations where eddy correlation techniques could be used to measure dry deposition.
(Environment Week, August 13, 1992, p. n/a)

Index Number: 40
Unique ID: 000392
Main Category: AIR TOXICS
Projects Type(s): modeling (computer)
coatings/paints/plating
Location(s): , , U.S.A.
Companies: Dow Chemical Company
Date: 10/19/92

Dow Chemical has established a computer-based program called the Applied Science of Solvency, which helps match variables including solvent choice and resin. The purpose of the program is to optimize time and effort in water-based paint formulation by pinpointing specific solutions tailored to individual customers. Dow's efforts have reportedly focused on paints for architectural, automotive, can and beverage, coal coatings, base coats for auto finishes, wood coatings, and maintenance and special purpose paints.
(Chemical Marketing Reporter, 10/19/92, p. SR32)

Index Number: 41
Unique ID: 000086
Main Category: AIR TOXICS
Projects Type(s): printing
Location(s): Fort Wayne, IN, 05 U.S.A.
Companies: Summit Resource Management, Inc.
Date: / /

Summit Resource Management, Inc. of Fort Wayne, IN is formulating a fountain solution for the printing industry that is reported to be ecologically compatible. This new solution will eliminate isopropyl alcohol and mineral acids, and strive for a vapor pressure level of zero. Another toxic ingredient in fountain solutions, ethylene glycol, will also be reduced through the substitution of a propylene-based glycol. These reductions and substitutions decrease the levels of harmful vapor in the air, and reduce the amount of toxins released into the printer's wastewater system. (EPA Announcement of Small Business Pollution Prevention Grants awarded)

Index Number: 42

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Unique ID: 000096
Main Category: AIR TOXICS
Projects Type(s): printing
VOCs
recycling
Location(s): , ,
Companies:
Date: 05/18/92

SoyInk is becoming highly demanded in the ink market not only because it is environmentally friendly, but also because of its superior print qualities. SoyInk is perceived as environmentally friendly because it is semi-biodegradable, quicker to de-ink during recycling, resource renewable, and emits fewer VOCs. Its superior print qualities include brighter color and ink mixing qualities. (Chemical Marketing Reporter, 5/18/92, p. 10.)

Index Number: 43
Unique ID: 000108
Main Category: AIR TOXICS
Projects Type(s): printing
VOCs
Location(s): Lancaster, PA, 03 U.S.A.
Companies: FFC International, Inc.
Date: 03/01/92

FFC International, Inc. of Lancaster, PA, has introduced a zero-VOC alcohol product for use in the dampening systems of sheetfed printers. Printing has traditionally been done with isopropyl alcohol, which allegedly is responsible for more than half of all VOCs emitted from sheetfed press rooms. (Graphic Arts Monthly, 3/92, p.56)

Index Number: 44
Unique ID: 000117
Main Category: AIR TOXICS
Projects Type(s): printing
dryers
VOCs
Location(s): De Pere, WI, 05 U.S.A.
Companies: TEC Systems
Date: 05/01/91

TEC Systems in De Pere, WI, has developed the Summit hot-air convection dryer for printing presses, reportedly the first model that does not require pollution control because the capability is built-in to the dryer. The problem with traditional heatset operations using solvent-based inks is that

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during drying, solvents laced with VOCs evaporate into the atmosphere unless trapped by pollution control systems. Using thermal afterburner technology, the Summit unit's combustion chamber destroys hydrocarbons at 1,400-1,600 degrees fahrenheit from solvents that have been evaporated. The Summit differs from conventional pollution control because it recirculates air into the dryer. The air can then be employed for absorptive chilling or other uses. The Summit also omits extra duct work and installation costs involved in using add-on pollution control systems. (American Printer, 5/91, p. 30)

Index Number: 45
Unique ID: 000097
Main Category: AIR TOXICS
Projects Type(s): SO2 controls
Location(s): , ,
Companies: Dow Chemical Company
Date: 05/01/92

Dow Chemical Company's Gas/Spec Technology Group has developed separation technologies that help power companies, natural resource producers, and manufacturers remove contaminants from gas streams in an environmentally safe way without incurring heavy expenses. One example is Dow's innovative new technology for removing sulfur dioxide flue gas. (Membrane and Separation Technology News, 5/92)

Index Number: 46
Unique ID: 000105
Main Category: AIR TOXICS
Projects Type(s): vapor recovery
VOCs
coatings/paints/plating
Location(s): Nashua, NJ, 02 U.S.A.
Companies: Ferrofluidics Corporation
Date: 04/14/92

A recently developed vapor seal that allegedly keeps VOC emissions to less than one part per million could help chemical and oil-refinery industries meet the requirements of the 1990 Clean Air Act amendments. The seal, built by Ferrofluidics Corporation, in Nashua, New Hampshire, is based on ferrofluid technology and is advertised as being 1,000 times more effective at reducing VOC emissions than any other seal on the market. (Clean Air Network Online Today, 4/14/92)

Index Number: 47
Unique ID: 000110

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Main Category: AIR TOXICS
Projects Type(s): vapor recovery
benzene control
Location(s): Baton Rouge, LA, 04 U.S.A.
Companies: Dow Chemical Company
Date: 11/13/91

More than 100,000 lbs/year of benzene emissions were reduced last year when Dow built a fully enclosed vapor recovery system at its loading docks on the Mississippi, at its Baton Rouge, LA, Plaquemine plant. Now when a barge is loaded, nitrogen and hydrocarbon gases are collected and cooled, and the unit recovers 98 percent in liquid form. A second dockside vapor recovery system, to be completed in 1995, will collect roughly 80 tons/year of chlorinated solvent products, including ethylene dichloride, perchloroethylene, carbon tetrachloride, and chloroform, among other highly regulated substances. Vapors will be collected, cooled, separated, and reused. (Chemical Week, 11/13/91)

Index Number: 48
Unique ID: 000111
Main Category: AIR TOXICS
Projects Type(s): vapor recovery
recycling
benzene control
crystallization
Location(s): Sauget, IL, 05 U.S.A.
Companies: Monsanto
Date: 11/06/92

Monsanto has achieved a large reduction of toxic air emissions; the greatest reduction has been made at its Sauget, IL, W.R. Krummrich plant. The plant wiped out 1 million lbs/year of paradichlorobenzene emissions by replacing the old unit with new crystallization technology. The new unit is enclosed and every chemical put into the process is recovered. Krummrich has reduced total emissions 65 percent since 1987, from 3.8 million lbs/yr to 1.34 million lbs. The installation of a new centrifuge reduced xylene emissions and, by next year, the plant will add new vents to recondense emissions for recycling and reuse. About \$200,000/year in feed chemicals will be saved. In addition, engineers at Krummrich designed a new railcar system that replaced the drum-filling system for phosphorus pentasulfide. It reduced emissions by 6,200 lbs/yr and it is the first time this type of system has been used for the product. (Chemical Week, 11/13/91) Monsanto reduced the emissions of paradichlorobenzene by 36% at its Sauget, IL, plant by installing a closed process that reuses the chemical. Emissions from the facility reportedly have been virtually eliminated. (Chemical Marketing Reporter, 11/6/92, P. SR21)

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Index Number: 49
Unique ID: 000101
Main Category: AIR TOXICS
Projects Type(s): VOCs
NOx controls
catalysts
Location(s): , , U.S.A.
Companies: Research-Cottrell
Date: 04/22/92

For NOX control, Research-Cottrell's control technologies include: combustion technologies, catalysts, and burners and the company is concentrating on developing technologies at 1/10 or 1/100 of the cost of currently available technologies. Three options are available for VOC emissions control: process modification, recovery, and thermal oxidation. These technologies encompass a range of sizes, structures, and flexibility. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 50
Unique ID: 000107
Main Category: AIR TOXICS
Projects Type(s): VOCs
recycling
Location(s): Minneapolis, MN, 05 U.S.A.
Companies: John Roberts Company
Date: 03/01/92

The John Roberts Company (Minneapolis, MN) has changed to a new solvent from one that nearly half evaporated before being used. Another change included reducing the amount of solvent in rags before laundering. Installation of a \$15,000 centrifuge recovers 2.5-3.5 gallons of spent solvent per 220 towels. Reuse of the solvent saves \$34,000 per year. (Graphic Arts Monthly, 3/92)

Index Number: 51
Unique ID: 000135
Main Category: AIR TOXICS
Projects Type(s): VOCs
Location(s): Marshall, TX, 06 U.S.A.
Companies: American Norit Company
Date: 06/08/92

American Norit Company opened its bituminous coal-based activated carbon plant in Marshall, TX, marking its entry into US production of activated carbon from

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bituminous coal. Activated carbon can be used to remove VOC's through its air separation and automotive evaporation control systems. (Chemical Marketing Reporter, 6/8/92, p. 9)

Index Number: 52
Unique ID: 000315
Main Category: AIR TOXICS
Projects Type(s): VOCs
coatings/paints/plating
Location(s): , ,
Companies: Union Carbide
Date: 11/01/92

Union Carbide's Solvents and Coatings Materials Division has reportedly added several licenses for its Unicarb system. The Unicarb process reduces VOC emissions from paints and other coatings up to 80% through the use of supercritical carbon dioxide to replace organic thinning and coalescing solvents in the formulation of spray coatings. Union Carbide reportedly is confident that there are major markets for the process in the furniture and automobile manufacturing industries. (High Tech Separations News, 11/92, V. 5, No. 6)

Index Number: 53
Unique ID: 000316
Main Category: AIR TOXICS
Projects Type(s): VOCs
COx controls
NOx controls
Location(s): South Lyon, MI, 05 U.S.A.
Companies: Engelhard Corporation
Salem Industries Inc.
Salem-Engelhard
Date: 10/05/92

A 50/50 partnership between Engelhard Corporation and Salem Industries, called Salem-Engelhard, has formed to market products that destroy volatile organic compounds (VOCs), carbon monoxide, and nitrogen oxide. VOC emission abatement equipment sales in 1991 were roughly \$500 million and should reportedly grow to \$1 billion by 1996. (Clean Air Network Online Today, 10/2/92 and Chemical Marketing Reporter, 10/5/92, p. 7)

Index Number: 54
Unique ID: 000317
Main Category: AIR TOXICS

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Projects Type(s): VOCs
coatings/paints/plating
Location(s): , ,
Companies: Witco
Date: 10/19/92

Specialized alkyd systems are being developed as an alternative to epoxy and urethane high solid and waterborne systems to reduce VOC emissions. Witco, is reportedly marketing a calcium sulfonate/alkyd product that is used in industrial maintenance coatings where surfaces, especially bridges, cannot be sandblasted, but must be hand-tool cleaned. (Chemical Marketing Reporter, 10/19/92, p. SR26)

Index Number: 55
Unique ID: 000318
Main Category: AIR TOXICS
Projects Type(s): VOCs
coatings/paints/plating
Location(s): , , Canada
Companies: Nacan Products
Date: 10/19/92

Nacan Products, a Canadian-based unit of National Starch, is reportedly promoting research and development for 'zero-VOC' technology. It is promoting a water-based emulsion for these types of paints called Vinamul 3692. (Chemical Marketing Reporter, 10/19/92, p. SR32)

Index Number: 56
Unique ID: 000320
Main Category: AIR TOXICS
Projects Type(s): VOCs
dryers
Location(s): , ,
Companies:
Date: 11/01/92

Regenerative thermal oxidation (RTO) technology can be adapted for use in various sludge management processes to control volatile organic compound, odor, and organic particulate emissions. RTO used in many dewatering and drying sources reportedly has the ability to destroy more than 99% of VOCs present. Volatile hydrocarbons, organic fumes, and complex organic compounds are oxidized through retention in a RTO unit for 1-2 seconds at temperatures of 1,500-1,800 degrees. RTOs provide up to 95% thermal energy recovery, almost all of the generated heat stays within the system while clean gases

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exit the stack in a plume-free rapid dispersion of water vapor, nitrogen and CO2 constituents. (Waste Information Digests, 11/92, V. 3, No. 11)

Index Number: 57
Unique ID: 000321
Main Category: AIR TOXICS
Projects Type(s): VOCs
filters/traps
scrubbers
biological technology
Location(s): , , France
, , Germany
, , USA
Companies: Elf Aquitaine
Gist Brocades
Bayer
3M
Date: 12/01/92

Elf Aquitaine (France), Gist Brocades (U.S.), Bayer (Germany), and 3M are reportedly using or testing biological flue gas cleaning processes. Biofilters and scrubbers can remove 90-95% of VOCs, including alcohols, amines, ethers, and aldehydes. Biofilters consist of 1 m-deep beds of peat, compost, heather or soil through which the contaminated gas is blown. Bioscrubbers are typically used when biodegradation products would damage the biofilter bed or for contaminants insoluble in water. Bioscrubbers are either activated sludge scrubbers or trickling filters. All biological treatment methods use aerobic microbes to convert organic and inorganic compounds to water, salts and CO2. Microbes that occur naturally in the sludge are usually used, although additional strains of microbes may be injected. The main advantages of biological processors are low capital and low operating costs. (Chemical Engineering, 12/92, P. 41-46)

Index Number: 58
Unique ID: 000322
Main Category: AIR TOXICS
Projects Type(s): VOCs
catalytic technology
Location(s): Vancouver, , Canada
Krakow, , Poland
Ornskoldsvik, , Sweden
Companies: MoDo-Chemetics
Institute of Catalysis and Surface Chemistry
Date: 11/01/92

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A catalytic oxidation process that can treat non-chlorinated volatile organic compounds (VOCs) in air without outside energy sources is being marketed in North America by MoDo-Chemetics Ltd., Vancouver, British Columbia. Heat exchangers recover the heat from the off-gases to pre-heat the incoming contaminated air stream making the system, known as the Swingtherm system, self-sustaining with regard to energy at low contaminant concentrations. The system is expected to achieve destruction efficiency of 97 to 98 percent. The Swingtherm principal was developed by the Institute of Catalysis and Surface Chemistry of Krakow, Poland, and engineering and further development was conducted by MoDo-Chemetics AB of Ornskoldsvik, Sweden. Thirty units are reported to be in operation in Sweden. (AirTECH News, 11/92, p. 151).

Index Number: 59
Unique ID: 000323
Main Category: AIR TOXICS
Projects Type(s): VOCs
vapor recovery
Location(s): Murray Hill, NJ, 03 U.S.A.
Portage, MI, 05 U.S.A.
Companies: Airco Gases
Upjohn Co.
Date: 11/01/92

A system that captures VOCs from industrial processes in a nitrogen blanket and then cools organics to recover them as a liquid is being marketed by Airco Gases of Murray Hill, NJ. The company's Kryoclean vapor recovery equipment is being installed at Upjohn Co.'s Portage, MI, manufacturing complex as a part of a \$60 million program to cut VOC emissions at the facility. In the Kryoclean process, a nitrogen blanket collects VOCs emitted from reactors, vessels, storage tanks, and driers and carries them to a heat exchanger, which usually uses two stages of cooling. Initial cooling is provided by an economizer. In the second stage, the vent gases (nitrogen carrier gas and VOCs) are further cooled to the condensation point of the VOCs. The condensed VOCs are recovered at an alleged efficiency of 95 to 99 percent. (AirTECH News, 11/92, p. 152).

Index Number: 60
Unique ID: 000325
Main Category: AIR TOXICS
Projects Type(s): VOCs
Location(s): San Jose, CA, 09 U.S.A.
Companies: Purus
Date: 09/01/92

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A proprietary adsorption/desorption process for recovering VOCs from air streams has been developed by Purus of San Jose, CA. The synthetic polymer resins employed in the system can handle high levels of humidity and can be regenerated more than 2,000 times without measurable loss of capacity, thereby improving the economics of VOC treatment. In the system, the contaminated air passes through two adsorption beds where the contaminants are adsorbed and the resulting clean air is vented to the atmosphere. Typically, more than 99 percent of the VOCs are removed from the air stream and 99.9 percent are recovered from the adsorption beds. Contaminant concentrations of up to 10,000 ppmv or 10 pounds/hour can be handled. The company is currently demonstrating the technology at two sites. (AirTECH News, 9/92, p. 122)

Index Number: 61
Unique ID: 000326
Main Category: AIR TOXICS
Projects Type(s): VOCs
CFCs, HFCs, HCFCs
Location(s): Pompton Plains, NJ, 03 U.S.A.
Tarrytown, NY, 02 U.S.A.
Companies: Edwards Engineering Corp.
Praxair Incorporated
Date: 09/01/92

Edwards Engineering Corp. of Pompton Plains, NJ, introduced a solvent recovery system that couples liquid nitrogen cooling with mechanical refrigeration techniques to condense VOCs, including chlorinated hydrocarbons. Developed in cooperation with the Linde Division of Praxair, Inc., Tarrytown, NY, the system can cool vapors to -300 degrees Fahrenheit and can reportedly achieve recovery rates of greater than 99 percent. The mechanical portion of the recovery unit, a cascade refrigeration system, uses environmentally safe refrigerants to cool the vapors to -100 degrees Fahrenheit. Passing through a second set of coils that are cooled by liquid nitrogen, the vapors condense and can be collected for reuse or disposal. By combining two cooling techniques, the cryo-mechanical system uses less nitrogens than a system that relies on nitrogen cooling alone and can handle a greater range of solvents. Edwards Engineering currently has one unit in operation and is reportedly installing several more. The nitrogen system can be used to update existing recovery units. (AirTECH News, 9/92, p. 122)

Index Number: 62
Unique ID: 000395
Main Category: AIR TOXICS
Projects Type(s): VOCs
Location(s): , ,
Companies:

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Date: 03/01/93

Corona destruction of volatile organic compounds (VOCs) and air toxics has reportedly shown significant promise for attaining mandated ozone levels in more than 100 non-attainment zones nationwide, and for reducing the health effects associated with exposure to hazardous air pollutants. Development of the industrial-scale corona reactor is the result of a need for technology to control low concentration streams, and the economic advantages of ambient temperature operation. (Industrial Health and Hazards Update, 3/93, V. 93, No. 03)

Index Number: 63
Unique ID: 000013
Main Category: ALTERNATIVE FUELS
Projects Type(s): battery technology
electric vehicle
Location(s): Fullerton, CA, 09 U.S.A.
Companies: General Motors' Hughes Aircraft
Date: 08/03/92

General Motors' Hughes Aircraft division of Fullerton, CA, has developed a new inductive charging system that charges electric cars' batteries electromagnetically instead of via standard metal-to-metal plug-in connections. The electromagnetic coupler is reportedly safer and easier to use than a standard plug-in, and it can load up on anything from a 100-volt household current to 220-volt clothes-dryer blasts of electricity. The charging stations or pumps will be wall-mounted 220-volt unit for home garages, a portable 110-volt household outlet, a 220-volt curbside column, and a gas-station style recharging kiosk for fleets. (Auto Week, 8/3/92, p.4)

Index Number: 64
Unique ID: 000031
Main Category: ALTERNATIVE FUELS
Projects Type(s): battery technology
electric vehicle
Location(s): Troy, MI, 05 U.S.A.
Companies: U.S. Advanced Battery Consortium
Ovonic Battery
Date: 05/25/92

The U.S. Advanced Battery Consortium a collaboration of the Big Three automakers and the Federal government awarded its first contract for \$18.5 million to Ovonic Battery Co. of Troy, MI, a small research firm that claims it has already invented the battery of the future. The company says that its first prototype "nickel-metal hydride" battery will propel a compact car 300

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miles on one charge, go 0 to 60 in eight seconds, attain a top speed of 100 mph, last 100,000 miles, and recharge in 15 minutes. All these results are equal to or considerably better than those achieved with existing technology. The company also claims that the cost per mile of operating an electric car with its battery will be less than half that of gasoline cars and, unlike other batteries, theirs is made of nontoxic materials. The contract with Ovonic, the first of several expected to be awarded to that company and to rivals, calls not only for work to improve the battery but to begin production. (Washington Post, 5/25/92, p. A3)

Index Number: 65
Unique ID: 000032
Main Category: ALTERNATIVE FUELS
Projects Type(s): battery technology
electric vehicle
Location(s): Lyon Station, PA, 03 U.S.A.
Mendota Heights, MN, 05 U.S.A.
Milwaukee, WI, 05 U.S.A.
, , Germany
Companies: U.S. Advanced Battery Consortium
East Penn Manufacturing
GNB Inc.
Johnson Controls
Tudor Group
Date: 05/25/92

The Advanced Lead-Acid Battery Consortium was formed to find ways to improve existing lead-acid battery technology for electric vehicles needing more energy for increased driving range and more power for increased acceleration. The industry's \$19.3 million effort is aimed at powering first- and second-generation electric vehicles that are likely to be second cars used in polluted urban areas. Firms participating in the consortium include East Penn Manufacturing of Lyon Station, PA; GNB Inc. of Mendota Heights, MN; Johnson Controls Inc. of Milwaukee, WI; and Tudor Group of Germany. (Automotive News, 5/25/92, p. 15)

Index Number: 66
Unique ID: 000038
Main Category: ALTERNATIVE FUELS
Projects Type(s): battery technology
electric vehicle
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
Electric Power Research Institute (EPRI)
Southern California Edison

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Chrysler Corporation
Date: 05/01/92

The SCAQMD is working with Electric Power Research Institute (EPRI), Southern California Edison (SCE), and Chrysler Motors to develop and demonstrate three battery-powered Chrysler minivans capable of a 120-mile range per electrical charge on nickel-iron batteries with performance comparable to conventional vehicles. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 42)

Index Number: 67
Unique ID: 000039
Main Category: ALTERNATIVE FUELS
Projects Type(s): battery technology
electric vehicle
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
San Diego Gas & Electric Company
Los Angeles Department of Water & Power
California Air Resources Board (CARB)
Arias Research Association
Date: 05/01/92

The SCAQMD is working with San Diego Gas & Electric Company, the Los Angeles Department of Water and Power (LADWP), and the ARB to develop and evaluate the Arias Research Association sealed bipolar lead-acid (SBLA) battery for electric vehicles. The SBLA offers unique advantages not found in other electric vehicle batteries, such as: high power density, high energy density, long battery life, low cost, and good thermal characteristics for hybrid vehicles. Advanced battery technology is needed to commercialize certain Zero-Emission Vehicles (ZEVs) and ULEVs for EVs and Hybrid Electric Vehicles (HEVs). Initial test results indicate that SBLAEV batteries will be able to propel current technology electric vans more than twice as far as existing lead-acid batteries. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 43)

Index Number: 68
Unique ID: 000043
Main Category: ALTERNATIVE FUELS
Projects Type(s): battery technology
electric vehicle
Location(s): , , U.S.A.
Companies: Ford Motor Co.
Date: 04/22/92

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Battery technology is the greatest cost of the electric vehicles being developed by Ford Motor Co. These vehicles offer several positive features, including good performance within a 100-mile daily range; the ability to recharge overnight, at home, rather than requiring a trip to the service station; relatively quiet; and the potential to be more reliable and require less maintenance than internal combustion vehicles. Disadvantages include reduced driving range; high cost; and short lifetime of batteries making electric vehicles more expensive to operate, per mile, than gasoline vehicles. Electric vehicles could be used primarily for utility vehicles, such as vans or commuter cars. Under Ford's electric vehicle demonstration program, 82 Eco-Star vans will be leased to customers in early 1993 for 30 months and then returned to Ford for evaluation. Batteries for the Eco-Star will weigh 800 pounds, while the body and frame of the vehicle will be made of lightweight materials to compensate. The Eco-Star has a range of 100 miles per day, acceleration of 0-50 mph in 12 seconds, a top speed of 70 mph, air conditioning and heating are optional features, and a recharge time of 6 hours on a 220 volt/30 amp outlet. Ford is also developing data on a fuel-fired heater, which does not reduce the driving range of electric vehicles, although air conditioning does affect the driving range. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 69
Unique ID: 000042
Main Category: ALTERNATIVE FUELS
Projects Type(s): catalysts
reformulated gasoline
Location(s): , , U.S.A.
Companies: W.R. Grace & Company
Date: 04/22/92

W.R. Grace & Co. is developing new catalysts to be used as feedstocks for refining products used in reformulated gasoline. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 70
Unique ID: 000051
Main Category: ALTERNATIVE FUELS
Projects Type(s): catalysts
MTBE
isobutylene
Location(s): , , U.S.A.
Companies: Engelhard Corporation
Date: 04/11/92

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Engelhard has developed 2 new catalysts that may save oil refineries \$2.5 billion when they retool to comply with new Clean Air Act standards. The new catalysts are reputed to significantly increase the output of isobutylene, which is used in the production of MTBE. Some states may require the use of oxygenated fuel at all times. Engelhard's Isoplus 1000 catalyst is said to raise isobutylene output from existing fluid catalytic cracking units by 76 percent. Isoplus 2000 will double isobutylene output. This could cut the estimated \$5 billion needed to add isobutylene capacity at refineries by 50 percent. (New York Times (National Edition), 4/11/92, p. 21)

Index Number: 71
Unique ID: 000036
Main Category: ALTERNATIVE FUELS
Projects Type(s): catalytic converters
methanol
catalysts
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
California Air Resources Board (CARB)
Southwest Research Institute
Date: 05/01/92

SCAQMD along with the California ARB sponsored a project to develop and demonstrate durable catalytic converters that enable methanol vehicles to meet the California ARB formaldehyde standard without increasing criteria pollutants. Southwest Research Institute (SwRI) tested the most promising system at the 4,000-mile durability point. Findings showed that special catalysts for formaldehyde control will not have a significant effect on car performance and should not increase the cost of the car substantially. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 35)

Index Number: 72
Unique ID: 000402
Main Category: ALTERNATIVE FUELS
Projects Type(s): catalytic technology
isomerization
Location(s): Houston, TX, 06 USA
Bloomfield, NJ, 03 USA
Companies: Lyondell Petrochemicals
CDTech
ABB Lummus Crest
Chemical Research & Licensing
Date: 02/01/93

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Lyondell Licensing, a subsidiary of Lyondell Petrochemical Co. (Houston) has entered into a joint development and licensing relationship with CDTech (Catalytic Distillation Technologies), a partnership between Chemical Research & Licensing Co. and ABB Lummus Crest Inc. (Bloomfield, NJ), to commercialize butene and pentene isomerization processes. Developed internally, Lyondell's butene isomerization technology utilizes a highly selective catalytic process while minimizing the production of lower value by-products. The process reportedly results in significantly lower capital costs than other commercially available technologies. Lyondell successfully tested this technology in the laboratory, pilot plant and a commercial-scale demonstration in 1992. CDTECH specializes in the licensing of etherification technologies such as MTBE and TAME. (Enhanced Energy Recovery News, 2/93, V. 16, No. 7)

Index Number: 73
Unique ID: 000277
Main Category: ALTERNATIVE FUELS
Projects Type(s): clean coal tech-other
low/medium sulfur coal
Location(s): La Jolla, CA, 09 U.S.A.
Companies: SGI International
Shell Mining
Wisconsin Power and Light Company
TEXPAR Energy
Date: 10/01/92

SGI International of La Jolla, CA, has developed a "Liquids From Coal" (LFC) process to produce liquid and solid fuels. The process has been enhanced by Shell Mining, and uses a low-sulfur coal with high moisture content to make a liquid product similar to No. 6 fuel oil, to be refinery burned or cracked for producing specialty fuels and a solid low-moisture, low-sulfur, high Btu coal for burning in power plants and capable of meeting emission standards. About 150,000 barrels of liquid fuel and 180,000 of solid fuel will be produced per year. About 30,000 tons/year of the solid fuel will be sold to Wisconsin Power and Light and about 135,000 barrels/year of the liquid fuel will be sold to TEXPAR Energy for marketing to industries. (Environmental Science & Technology, 10/92 p. 1860+)

Index Number: 74
Unique ID: 000276
Main Category: ALTERNATIVE FUELS
Projects Type(s): clean fuels - other
propane
Location(s): Anaheim, CA, 09 U.S.A.
Companies: Ford Motor Co.
Date: 09/01/92

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Ford Motor Co. unveiled its first production heavy truck that uses liquefied petroleum gas (LPG) at the 1992 International Trucking Show held in July in Anaheim. The 1993 Ford F-600G and F-700G meet and exceed California's 1991 emissions standards for manual transmission, 1998 standards for automatic transmission vehicles, and amended Federal emissions standards. The LPG consumes about 5% more fuel than gasoline for an equivalent performance, but it costs 15% less than gasoline. The LPG vehicles also reportedly have longer anticipated engine life than gasoline engines. (Beverage Industry, 9/, p. 22)

Ford is offering F-600 G and F-700 G medium-duty trucks, modified to run on liquid petroleum gas or propane. (Aftermarket Business, 1/1/93, p. 19)

Index Number: 75
Unique ID: 000014
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
Location(s): St. Louis, MO, 07 U.S.A.
Companies: Lambert Airport
Date: 08/01/92

Lambert Airport in St. Louis, MO, recently completed tests of a soybean oil diesel fuel, a blend of 20 percent soybean based diesel (methyl soyate) and 80 percent conventional diesel. The fuel, tested in 10 of the airport's maintenance vehicles, emits significantly fewer particulates, hydrocarbons, and carbon monoxide than regular diesel fuel. (Pollution Prevention News, 8/92)

Index Number: 76
Unique ID: 000054
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
biological technology
catalysts
SO2 controls
Location(s): Sioux Falls, SD, 08 U.S.A.
Livorno, , Italy
Germany
Companies: Novamont North America
Ferruzzi-Montedison
Mercedes-Benz
Date: 09/07/92

Biodiesel fuel, an alternative diesel made from esterified vegetable oils, is being tested in city buses in Sioux Falls, SD. Novamont North America, a Ferruzzi-Montedison subsidiary will supply "Diesel-Bi" fuel for two buses for

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the next four or five months. Biodiesel fuel is created by reacting crude vegetable oil and methanol in the presence of a catalyst to yield methyl ester. Both rapeseed oil and soybean oil will be used in the tests. The environmental advantages claimed for biodiesel fuel include no sulfur emissions, a no-net gain of CO₂ (the amount emitted during combustion equals that photosynthesized during oilseed growth), a flashpoint double that of diesel fuel, and biodegradability. Ferruzzi has reported these results based on tests conducted in Europe over the past few years. The Sioux Falls tests resemble ones in buses and taxis in European cities. In conjunction with Mercedes-Benz, the company hopes to fuel 40,000 taxis throughout Germany by 1995. A 60,000 metric-ton-per-year biodiesel plant under construction in Livorno, Italy, should be completed in 1992. Diesel-Bi has reportedly passed European emission tests, which are less stringent than American tests. Company data shows Diesel-Bi emissions of carbon monoxide at 60 percent of the European Community emission levels for 1993, 90 percent of hydrocarbons, 65 percent of nitrogen oxide, and 95 percent of particulate. Biodiesel fuel can be used in testing or as a fuel additive while emissions data is still being gathered in the U.S. to submit to EPA in several months. (Chemical Marketing Reporter, 4/06/92, p. 5) Novamont, a Ferruzzi-Montedison subsidiary, has supplied 'Diesel-Bi' fuel for a test on buses in Sioux Falls, SD. (Chemical Marketing Reporter, 9/7/92, p. 5)

Index Number: 77
Unique ID: 000055
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
biological technology
recycling
Location(s): Leawood, KS, 07 U.S.A.
Kansas City, KS, 07
Companies: Interchem NA Industries Inc.
Date: 04/06/92

Interchem NA Industries Inc. of Leawood, KS, has produced a few thousand gallons of biodiesel fuel and reportedly broke ground on May 1 for a 3 million gallon per year plant in Kansas City. The company specializes in processing waste materials for energy. As the cost of alternative fuels becomes a main factor in their acceptance, one significant advantage to biodiesel fuel is that it reportedly appears to be the most cost-effective option available. (Chemical Marketing Reporter, 4/06/92, p.5)

Index Number: 78
Unique ID: 000260
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology

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 catalytic technology
 SO2 controls
Location(s): , , Singapore
Companies: Mobil Corporation
Date: 11/16/92

Mobil Oil Singapore began construction of a \$93 million catalytic hydrodesulfurization unit that will increase diesel production at its refinery by 25,000 b/d. The unit is capable of producing diesel with 0.005% weight sulfur, enabling Mobil to meet regional demands for low sulfur diesel. The project, to be completed in January 1994, includes a 25,000 b/d amine unit and a 120 ton/day sulfur recovery unit. (Oil and Gas Journal, 11/16/92, p. 39)

Index Number: 79
Unique ID: 000262
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
 SO2 controls
Location(s): Warren, PA, 03 U.S.A.
 Boise, ID, 10 U.S.A.
Companies: United Refining Co.
 Morrison Knudsen Corp.
Date: 10/19/92

United Refining Co., Warren, PA, contracted Morrison Knudsen Corp., Boise, ID, to design and build a distillate hydrotreater and sulfur plant for its 64,600 b/d Warren refinery in order to produce lower sulfur motor diesel fuel. (Oil and Gas Journal, 10/19/92, p. 40)

Index Number: 80
Unique ID: 000265
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
 SO2 controls
Location(s): Mt. Vernon, IN, 05 U.S.A.
Companies: Indiana Farm Bureau
 Howe-Baker
Date: 10/26/92

A 9,000 b/d diesel desulfurization expansion by the Indiana Farm Bureau in Mt. Vernon, IN, is in the engineering stage. The contractor is Howe-Baker and the project is scheduled to be completed sometime in 1993. (Oil and Gas Journal, 10/26/92, p. 117)

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Index Number: 81
Unique ID: 000268
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
biological technology
particulates
SO2 controls
Location(s): Leawood, KS, 07 U.S.A.
St. Louis, MO, 07 U.S.A.
Sioux Falls, SD, 08 U.S.A.
Companies: Interchem NA Industries Inc.
Proctor & Gamble
St. Louis Lambert International Airport
Date: 10/05/92

Interchem (N.A.) Industries Inc., Leawood, KS, received a commitment from Procter & Gamble (P&G) to produce as much as 15 million gal/year of a synthetic diesel motor fuel made from soybean coconut, and palm oils and animal fats. The fuel reportedly emits 86% less smoke, more than 50% less particulate and carbon monoxide, and almost no sulfur compared with conventional diesel. More than 100 diesel maintenance vehicles at St. Louis Lambert International Airport are being run on bio-diesel fuel in a joint venture between the airport and the Missouri Soybean Merchandizing Council. More that 60 city buses in St. Louis, Sioux Falls, SD, and Kansas City, MO, operate on the biomass diesel fuel. P&G will supply the fuel at a fixed cost plus feedstock price. Initial markets for the fuel include diesel engines operated indoors and marine engines to protect waterways. (Oil and Gas Journal, 10/5/92, p. 37 and Chemical Marketing Reporter, 9/7/92, p. 5)

Index Number: 82
Unique ID: 000329
Main Category: ALTERNATIVE FUELS
Projects Type(s): diesel technology
Location(s): , , U.S.A.
Companies: National Center for Agricultural Utilization
U.S. Department of Agriculture
Date: 09/07/92

Researchers at the National Center for Agricultural Utilization Research, have been sponsoring tests at midwestern universities on blends of vegetable oils and various chemicals and diesel fuel. Candidate fuels that passed the USDA-sponsored, 200-hour test include methyl, ethyl and butyl esters; a blend of 25% sunflower seed oil and conventional diesel fuel; a blend of 25% soybean oil and dry cleaning naphtha; and a micro-emulsion fuel of approximately 53% soybean oil and methyl alcohol with 2-octanol used as a dispersant. (Chemical Marketing Reporter, 9/7/92, p. 5)

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Index Number: 83
Unique ID: 000016
Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
Location(s): Fullerton, CA, 09 U.S.A.
Companies: General Motors' Hughes Aircraft
Saturn Corporation
Date: 07/27/92

General Motors and Saturn Corp. are working to develop service programs for the Impact electric car. The Impact, an electric commuter sports car, is due to go on sale in mid-decade. Hughes Power Control Systems, a division of Hughes Aircraft Co., Fullerton, CA, is supplying a line of inductive coupler charging stations that deliver electricity to electric vehicles. The coupler transfers electricity from the source to the car through a small plastic paddle, rather than through a conventional, pronged metal plug making it easier and safer to use. (Automotive News, 7/27/91, p. 6)

Index Number: 84
Unique ID: 000017
Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
battery technology
Location(s): Los Angeles, CA, 09 U.S.A.
Burbank, CA, 09 U.S.A.
Geneva, , Switzerland
Tokyo, , Japan
Companies: General Motors' Hughes Aircraft
Amerigon Inc.
Lockheed Aircraft
Date: 07/27/92

California is trying to position itself as the home of the emerging electric vehicle industry as 17 component suppliers that are part of the CalStart initiative, launched the Showcase Electric Vehicle Program in Los Angeles. They are planning to build a prototype electric car to market their technology to the auto industry. The prototype car is a 2+2 coupe using lead-acid batteries and the Hughes induction charging system. A composite body will rest on only an aluminum frame and the car will supposedly have a range of 100 miles and accelerate from 0-60 mph in less than 11 seconds. Design work began in September 1991 at Amerigon Inc., the lead company on the project. Lockheed Aircraft has offered to loan one of its Burbank, CA, facilities to Amerigon, Inc., for use in the design and manufacture of electric vehicles. The prototype is to be assembled in September and its sponsors will spend three

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months evaluating the systems. The working prototype will debut at the Greater Los Angeles Auto Show in January 1993 before moving on to Geneva and Tokyo showing the technologies that California companies can provide. (Automotive News, 7/27/92, p. 6)

Index Number: 85
Unique ID: 000018
Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
battery technology
Location(s): Batavia, OH, 05 U.S.A.
Companies: Ford Motor Co.
General Electric Company
Date: 07/20/92

Ford Motor Co. has created a new department to oversee production of a test fleet of electric vehicles. The Electric Vehicle Segment will produce a pilot run of Ecostar electric vans that will be introduced to utility customers early in 1993. The Ecostar is based on the European Escort using a sodium sulfur battery and delivering 75 horsepower with a range of 100 miles and a top speed of 75 miles per hour. General Electric Co. developed the drivetrain for Ford Ecostar and Ghia Connecta, an electric minivan concept. Ford plans to release 80 to 100 vans in the U.S. and Europe. The company has speculated that a transmission plant in Batavia, OH, may be selected by next summer or fall to produce a line of electric vehicles. (Automotive News, 7/20/92, p. 7)

Index Number: 86
Unique ID: 000022
Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
hydrogen
Location(s): Portland, ME, 01 U.S.A.
Companies: Maine Energy Coalition
Date: 07/06/92

The Maine Energy Coalition is planning an "electric car barn" in the Portland area to promote, sell, recharge, and service electric cars. The facility will also exhibit hydrogen-powered cars and low-emissions, high-efficiency internal combustion vehicles and serve as an energy information center. (Automotive News, 7/06/92, p. 19)

Index Number: 87
Unique ID: 000025

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Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
battery technology
Location(s): , ,
Companies: Hyundai Motor Corp.
Ovonic Battery
Date: 06/22/92

Hyundai Motor Co. has unveiled a second electric car as part of an estimated \$12.8 million program aimed at having a commercially viable electric car on the market by 1995. The car is a basic Excel equipped with electric drive and a lead-acid battery pack with a reported range of 55 miles and top speed of 55 mph. Mass production in 1995 is planned for an electric car based on the Sonata that will have a maximum speed of 85 mph and will run 200 miles on each charge. Last year Hyundai signed an agreement with Ovonic Battery Inc. to jointly develop batteries and efforts are now focusing on developing new battery technology, specifically nickel-hydrogen batteries. By 1995, Hyundai plans to develop its own gearbox and control systems for electric cars. (Automotive News, 6/22/92, p. 35)

Index Number: 88
Unique ID: 000030
Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
battery technology
Location(s): , , Japan
Companies: Mitsubishi
Tokyo Electric Power Company
Date: 05/25/92

Mitsubishi Motors Corp. introduced the Libro station wagon that will be the base of an electric car that is planned for 1993. The electric car will have a range of 125 miles per charge and a maximum speed of 68 mph. The vehicle will be available either with lead-acid or nickel cadmium batteries and will incorporate a charge meter, much like a traditional gasoline gauge, to display the amount of electricity remaining. An on-board charger will recharge the battery in eight hours while an off-board system will recharge the car in only two hours. The vehicle is part of a cooperative project with Tokyo Electric Power Co. and 20 or 30 cars will be built. (Automotive News, 5/25/92, p. 8)

Index Number: 89
Unique ID: 000040
Main Category: ALTERNATIVE FUELS
Projects Type(s): electric vehicle
battery technology

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solar
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
Solar Electric Engineering Inc.
Date: 05/01/92

A commercially available, retrofitted solar electric vehicle was tested as part of SCAQMD's efforts to demonstrate new transportation technologies. Solar Electric Engineering, Inc. (SEE) has developed and is currently producing a battery-powered electric vehicle that integrates photovoltaic solar panels with deep-cycle, lead-acid batteries to achieve a claimed range of 40 to 60 miles per charge. The two-passenger Pontiac Fiero with manual transmission is capable of a 65 mph top speed when the 108-volt lead-acid Trojan battery pack is fully charged. SEE estimates that the batteries will last for three years, depending on the number of charge/discharge cycles. The vehicle uses a 24-volt direct current, brush-type electric motor. The solar panel, located on the car's hood provides about 200 peak watts of power, adding about 5 percent range, but the primary purpose of the solar cells is to trickle charge the battery pack. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 45)

Index Number: 90
Unique ID: 000005
Main Category: ALTERNATIVE FUELS
Projects Type(s): ETBE
Location(s): Corpus Christi, TX, 06 U.S.A.
Companies: ARCO
Coastal Corporation
Date: 12/28/92

ARCO Chemical Co. started commercial production of ETBE Dec. 14, 1992, at Coastal Refining & Marketing Inc.'s Corpus Christi MTBE plant. The first production run is targeted at 130,000 barrels of ETBE. ARCO is leasing the Coastal plant to demonstrate the flexibility of switching production between MTBE and ETBE. Several major gasoline producers including Chevron Corp. and Shell Oil Co. will evaluate ETBE as gasoline blending stock. ARCO is reportedly the first company to produce commercial volumes of ETBE for the merchant market. (Oil and Gas Journal, December 28, 1992, p. 27)

Index Number: 91
Unique ID: 000273
Main Category: ALTERNATIVE FUELS
Projects Type(s): ETBE
MTBE
Location(s): Yorktown, VA, 03 U.S.A.

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Companies: Amoco Oil Company
Date: 08/17/92

Amoco Oil Co.'s Yorktown, VA, refinery was reported to be conducting the first commercial production test of ETBE in a unit normally used to produce MTBE. Amoco plans to produce 400-500 b/d. (Chemical Marketing Reporter, August 17, 1992, p. 5)

Index Number: 92
Unique ID: 000279
Main Category: ALTERNATIVE FUELS
Projects Type(s): ETBE
MTBE
Location(s): , CA, 09 U.S.A.
Companies: Chevron U.S.A.
Date: 11/01/92

Chevron U.S.A. Products Company announced that for two months in summer 1993, it will use ETBE as an alternative to MTBE in its gasolines sold in southern California. Chevron has three MTBE plants in operation or under construction that could be modified to produce either ETBE or MTBE. If the ETBE experiment is successful, the company will have greater flexibility in choosing oxygenates for its gasoline products. (Industrial Environment, November 1992, V. 3, No. 11)

Index Number: 93
Unique ID: 000015
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
reformulated gasoline
Location(s): Tulsa, OK, 06 U.S.A.
Companies: Sun Company
EnviroFuels
Date: 07/27/92

Sun Company is producing a low-emissions, ethanol blend gasoline for use in Tulsa, OK, municipal vehicles during a two-month trial run beginning in late July. The fuel, called E-2020, was developed jointly by Sun Fuels and EnviroFuels (Tulsa, OK). The fuel contains approximately 8 percent ethanol blended with a mixture of refined, regular unleaded gasoline, and detergents. (Chemical Marketing Reporter, 7/27/92)

Index Number: 94
Unique ID: 000021

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Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
recycling
Location(s): , TX, 06 U.S.A.
Companies: Texas A&M
AFEX Corporation
Date: 07/08/92

Researchers at Texas A&M University and AFEX Corporation have developed a process that converts municipal solid waste into ethanol. The fiber portion of the waste is treated with cellulose enzymes to convert the fiber into fermentable sugars, which are then fed to yeast in order to produce ethanol through fermentation. Each ton of waste can yield 45 gallons of ethanol. (Alternative Energy Network Online Today, 7/8/1992)

Index Number: 95
Unique ID: 000023
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
variable fuel vehicles
Location(s): Milwaukee, WI, 05 U.S.A.
, IL, 05 U.S.A.
Companies: General Motors Corporation
Department of Energy
Date: 07/06/92

In Milwaukee, WI, General Motors presented the Chevrolet Lumina Variable Fuel Vehicle reported to be one of the nation's first ethanol fueled cars. The vehicle is the first of a 50-car ethanol fleet to be distributed among Wisconsin, Illinois, and the Department of Energy. (Automotive News, 7/06/92, p. 36)

Index Number: 96
Unique ID: 000056
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
biological technology
recycling
Location(s): , ,
Companies: Quadrex Corporation
Date: 04/06/92

Plans are still underway at Quadrex Corporation to construct an ethanol plant that will use yard waste for feedstock. Quadrex holds the exclusive patented

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technology for converting biomass waste to ethanol. (Alternative Energy Network Online Today, 4/06/92)

Index Number: 97
Unique ID: 000070
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
Location(s): Kingston, , Jamaica
Companies: Tropicana International
Petrojam Ltd.
U.S. International Trade Commission
Date: 03/01/92

Tropicana International (a Kingston-based firm owned by U.S. shareholders) and Petrojam Ltd. (a state-owned Jamaican company) say they will export 40 million gallons of ethanol to the U.S. this year, up by 9 million gallons from last year. Consumption is expected to increase as more U.S. states comply with new clean air requirements. The U.S. International Trade Commission has agreed to allow limited amounts of ethanol to enter the U.S. duty free if the ethanol meets a minimum of 35 percent of local value added in its production. The Caribbean producers, mainly Jamaica and Costa Rica, are allowed 7 percent of the U.S. market (or 60 million gallons) for ethanol as a motor fuel. (Caribbean Update, 3/92)

Index Number: 98
Unique ID: 000076
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
Location(s): Pekin, IL, 05 USA
Companies: Midwest Grain
Date: 01/31/92

The implementation of the 1990 Clean Air Act is expected to help earnings at Midwest Grain. One of the co-products of wheat gluten and wheat starch, the company's basic products, is fuel alcohol (ethanol). (Investext, 1/31/92, p. 1-9) Midwest Grain Products will double capacity for alcohol production at Pekin, IL by 1995. (Milling & Baking News 1/12/93, p. 10)

Index Number: 99
Unique ID: 000079
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
Location(s): , IA, 07 U.S.A.
Companies: Iowa Corn Growers Association

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Date: 01/06/92

The Iowa Corn Growers Association is considering changing the priorities of its program from developing export markets to devising new domestic consumption by creating new uses for corn. Among these new uses for which there may be potential markets is the use of corn as ethanol for fuel. Speculation on the future of the ethanol market is that the use of corn to make ethanol could double or triple within months to satisfy the oxygenate market. (Chemical Marketing Reporter, 1/06/92, p. 27)

Index Number: 100
Unique ID: 000278
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethanol
recycling
biological technology
Location(s): , FL, 04 U.S.A.
Companies: Bionol
Finch, Pruyn & Co.
BioEnergy International
Quadrex Corporation
University of Florida
Date: 11/01/92

BIONOL Corporation will take paper sludge from Finch, Pruyn & Co. and, using a bacteria bioengineered at the University of Florida, turn it into fuel-grade ethanol. The process is reportedly capable of converting many types of organic waste matter, including municipal waste, agricultural refuse, landfill waste and paper sludge, into ethanol fuel. BIONOL has agreed to build 100-million gallons of ethanol plant capacity, in conjunction with BioEnergy International, a subsidiary of Quadrex Corporation. BIONOL is also analyzing paper waste samples from Scott Paper and other major paper mills. (Industrial Environment, November 1992, V. 3, No. 11)

Index Number: 101
Unique ID: 000062
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethylene
Location(s): Point Comfort, TX, 06 U.S.A.
Companies: Formosa Plastics
Date: 03/30/92

Formosa Plastics Texas's 680,000 ton ethylene plant is due to start up in Point Comfort, TX, in the first quarter of 1993. (Chemical Marketing Reporter, 3/30/92, p. 5)

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Index Number: 102
Unique ID: 000063
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethylene
Location(s): Freeport, TX, 06 U.S.A.
Alberta, , Canada
Companies: Dow Chemical Company
Date: 03/30/92

Dow Chemical is planning new ethylene plants in Alberta, Canada, and Freeport, TX, in late 1994 and early 1995. (Chemical Marketing Reporter, 3/30/92, p.5)

Index Number: 103
Unique ID: 000256
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethylene
Location(s): , , China
Houston, TX, 06 U.S.A.
Companies: U.S. Export-Import Bank
China Petrochemical International Corp.
JGC Corporation
Date: 12/28/92

The U.S. Export-Import Bank approved a \$17.4 million loan to support the sale of U.S. equipment and services to China Petrochemical International Corp. for construction of an ethylene plant at the Maoming Petrochemical complex in South China. JGC Corporation of Houston, will act as the exporter for the U.S. contracts. (Oil and Gas Journal, 12/28/92, p. 27)

Index Number: 104
Unique ID: 000401
Main Category: ALTERNATIVE FUELS
Projects Type(s): ethylene
Location(s): Yeochun, , Korea
Companies: Han Yang Chemical Corporation
Stone & Webster
Mobil Corporation
Date: 02/08/93

Han Yang Chemical Corp started up a 350,000 ton/year ethylene plant at Yeochun, Korea. It is the first plant to use the Advanced Recovery System (ARS) developed by Stone & Webster Inc. and Mobil Chemical Co. ARS technology uses a dephlegmator to reduce recovery section energy consumption by an

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estimated 10% compared with conventional plants. (Oil and Gas Journal, 2/8/93, p. 41)

Index Number: 105
Unique ID: 000011
Main Category: ALTERNATIVE FUELS
Projects Type(s): flexible fuel vehicle
Location(s): , ,
Companies: Chrysler Corporation
Date: 08/24/92

Chrysler Corp. is conducting a pilot run of 30 of its new LH sedans powered by 3.3-liter flexible fuel engines. These vehicles will be used in government, not private, fleets. (Automotive News, 8/24/92, p.16)

Index Number: 106
Unique ID: 000034
Main Category: ALTERNATIVE FUELS
Projects Type(s): flexible fuel vehicles
methanol
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
California Air Resources Board (CARB)
Volvo
Date: 05/01/92

The South Coast Air Quality Management District (SCAQMD), the California Air Resources Board (ARB), and Volvo co-sponsored a project to demonstrate that five Volvo Flexible Fuel Vehicles (FFVs) are capable of achieving Ultra Low Emission Vehicle (ULEV) standards through the use of a clean-burning fuel, methanol, and electrically-heated catalysts (EHCs). Volvo has produced five demonstration 940 FFVs that, upon ignition, activate a small battery in the car's trunk that powers a resistive heating element in the special catalyst. Three to five cars have been operating in California since May 1991, and, although emissions have been lowered, more data is needed. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 30)

Index Number: 107
Unique ID: 000035
Main Category: ALTERNATIVE FUELS
Projects Type(s): flexible fuel vehicles
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)

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General Motors Corporation
Chrysler Corporation
Nissan Motor Co. Ltd
Volkswagen

Date: 05/01/92

The SCAQMD purchased 120 FFVs from General Motors, Chrysler, Nissan, and Volkswagen, and acquired some additional FFVs on loan, to test the performance and reliability of FFVs and their commercial viability. Ford, General Motors, and Chrysler plan to make FFVs available to the public in 1993 and Ford expects to certify the 1993 Taurus FFV at Transitional Low Emission Vehicle standards. These vehicles are expected to be made available to consumers by manufacturers at no extra cost. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 31)

Index Number: 108
Unique ID: 000041
Main Category: ALTERNATIVE FUELS
Projects Type(s): flexible fuel vehicles
methanol
Location(s): , CA, 09 U.S.A.
Companies: Ford Motor Co.
General Motors Corporation
Chrysler Corporation
Date: 04/22/92

Ford and General Motors are certifying their "flex-fuel" vehicles that run on either methanol or gasoline to meet California's Transitional Low Emissions Vehicle standard by 1992. Chrysler is planning to sell its "flex-fuel" vehicle in 1993 for the same price as conventional gasoline vehicles, offering consumers the flexibility of filling their tanks with methanol in nonattainment areas where methanol will be available, or using gasoline on trips away from the city. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92-- 4/23/92)

Index Number: 109
Unique ID: 000048
Main Category: ALTERNATIVE FUELS
Projects Type(s): flexible fuel vehicles
natural gas vehicle (NGV)
methanol
filters/traps
Location(s): , CA, 09 U.S.A.
Companies: Southern California Rapid Transit District (SCRTD)
Cummins Engine, Inc.

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3M
Donaldson Corporation
Owens Corning
04/22/92

Date:

The Southern California Rapid Transit District (SCRTD) has 10 Flexible buses with Cummins engines that run on compressed natural gas, and, except for the time required to fill all six tanks on these buses, have performed well. The fleet has 30 methanol buses built by TMC. "Avocet", used by the SCRTD in 12 GMC RTS buses which run on methanol, increases the high octane, low cetane properties of methanol, facilitating combustion and allowing buses to be converted from diesel fuel to methanol avocet. For the past two years, the SCRTD has had a retrofit program using Donaldson/Owens Corning and Donaldson/3M particulate traps. The SCRTD is also exploring the options of electric trolley buses, the development of fuel cells, the development of a lightweight bus with traction motors in which all four wheels run on a low combustion internal engine, and the use of liquified natural gas which weighs less than compressed natural gas and takes less time to refuel. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 110
Unique ID: 000052
Main Category: ALTERNATIVE FUELS
Projects Type(s): flexible fuel vehicles
reformulated gasoline
Location(s): Waterford, NY, 02 U.S.A.
Companies: GE Silicones
Date: 04/06/92

GE Silicones fuel-flex laboratory in Waterford, NY, is searching for a cost-effective way to build cars that run on alternate fuels. GE expects that demand for alternate fuels will grow larger as manufacturers introduce flex-fuel vehicles that have the flexibility to switch back and forth between gasoline and blends of gasoline and alcohol-based fuels. Alcohol-based fuels burn cleaner, but attack elastomers, metals, plastics, and other materials that are used in conventional engine gaskets, fuel lines, and seals. The lab is specifically designed to test automotive parts made from elastomers in the presence of alternate fuels. Traditional approaches tested only materials used rather than actual parts. (Chemical Marketing Reporter, 4/06/92, p. 21)

Index Number: 111
Unique ID: 000050
Main Category: ALTERNATIVE FUELS
Projects Type(s): hydrogen
gasification

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NOx controls
COx controls
Location(s): , , U.S.A.
Companies: HydroGEN Supply Co.
Texaco
Union Carbide
Date: 04/20/92

A new business venture could capture a significant share of the surging market for hydrogen, on which oil refineries are relying to cut sulfur content in diesel fuel. HyTEX, a hydrogen-generation process developed by Texaco Inc., which, with Union Carbide Industrial Gases Inc. (UCIG), plans to develop and operate high-purity hydrogen production facilities that could begin producing hydrogen less than two years after a contract is signed. The joint venture, named HydroGEN Supply Co., combines the Texaco gasification system with UCIG's experience in cryogenic and advanced air separation technology. Gasification generates a high grade of hydrogen from natural gas and refinery off-gas streams with less NOX and carbon dioxide emissions than conventional methods. Oxygen, supplied by UCIG's air separation technology, converts feedstock into hydrogen while reducing operating costs and improving efficiency. (Coal & Synfuels Technology, 4/20/92)

Index Number: 112
Unique ID: 000282
Main Category: ALTERNATIVE FUELS
Projects Type(s): methane
Location(s): Tuscaloosa, AL, 04 U.S.A.
Companies: Taurus Exploration Corp.
Date: 10/05/92

Taurus Exploration Inc. is using centralized compressors to produce coalbed methane gas. The centralized compressor system allows methane gas to be shifted from station to station via an interconnecting low-pressure pipeline system and requires less monitoring equipment than decentralized systems. With an interconnected pipeline network; centralized compressor stations; and high-speed, low emission compressor sets, Taurus is apparently able to produce low cost coalbed methane that meets air quality emissions standards. (Oil and Gas Journal, 10/5/92, pp. 58-60)

Index Number: 113
Unique ID: 000007
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
gasification
Location(s): Dagget, CA, 09 U.S.A.

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Companies: Allentown, PA, 03 U.S.A.
Charleston, WV, 03 U.S.A.
Los Angeles, CA, 09 U.S.A.
Cool Water Gasification
U.S. Department of Energy
Air Products & Chemicals
Date: 09/07/92

The U.S. Department of Energy and industry participants are helping to fund a project by Air Products and Chemicals Inc., Allentown, PA, to demonstrate advanced technology for producing methanol from coal-derived synthesis gas on a commercial scale. The project will take place at the Cool Water Gasification plant in Daggett, CA, where methanol production technology will be integrated with the existing combined cycle power plant at the site. The project will demonstrate a liquid phase methanol synthesis process that is said to be more efficient than the conventional "gas phase" process, thus enabling a gasifier to run continuously at its most efficient level. During periods of low power demand, synthesis gas made by the gasifier would be converted to methanol for storage. At peak power demand, that methanol could be used to supplement the combustion turbine. Methanol produced in the demonstration unit will be tested at the Cool Water facility and in offsite boiler and transportation applications, including bus and van pool tests in the Charleston, WVA, and in the Los Angeles areas. Air Products plans to offer the commercial system to utilities on an own-and-operate basis. Construction is to begin in late 1993 with the four-year operation/test period scheduled to begin in early 1995. (Oil and Gas Journal, 9/07/92, p. 31)

Index Number: 114
Unique ID: 000008
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
Location(s): Clear Lake, TX, 06 U.S.A.
Vancouver, , Canada
Dallas, TX, 06 U.S.A.
 , , Germany
New Orleans, LA, 06 U.S.A.
Companies: Gulf Coast Methanol Co.
Methanex Corporation
Hoechst Celanese
American Cyanamid
Metallgesellschaft Corporation
Date: 09/07/92

Methanex Corp. of Vancouver, Canada, partially controlled by Metallgesellschaft of Germany, in agreements totalling \$220 million, will be in partnership with Hoechst Celanese Chemical Group of Dallas and American

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Cyanamid. The partnership will have 1.4 million metric tons production capacity. Methanex will contribute \$70 million to restart an idle Hoechst Celanese methanol plant in Clear Water, TX, to produce 600,000 metric tons of methanol annually. Called Gulf Coast Methanol Co., the plant will reportedly have a production capacity of 1,800 metric tons/day, with the unit coming on line in the fourth quarter of 1993. Methanex will also reportedly spend \$97 million to convert a Cyanamid ammonia plant in Fortier, LA, near New Orleans, to a 1,645 metric tons/day producer of methanol. This will add approximately 400,000 metric tons to its annual capacity. The facility is scheduled to start up at the end of 1993. (Oxy-Fuel News, August 24, 92, V. 4, No. 20, p. 1; Oil and Gas Journal, 8/31/92, p. 30 and Coal & Synfuels Technology, September 7, 1992, V. 13, No. 35)

Index Number: 115
Unique ID: 000020
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
flexible fuel vehicles
Location(s): , CA, 09 U.S.A.
Companies: Hyundai Motor Corp.
California Air Resources Board (CARB)
Date: 07/13/92

Hyundai Motor Corp. unveiled a prototype of a flexible-fuel vehicle planned for production in 1996 or 1997. The prototype, a Scoupe, is equipped with Hyundai's new 1.5-liter, 12-valve Alpha engine that has been modified to burn gasoline or gasoline/methanol mixtures up to 85 percent methanol. The principal modifications include treating valve seats with an anticorrosion agent and changing all materials in the fuel system to resist the corrosive effects of methanol. Fluorocarbon coating and nickel plating were used on the fuel delivery system and stainless steel was selected for the fuel tank and fuel lines. Production cars are expected to be equipped with plastic tanks. Two prototypes will be shipped to the California Air Resources Board later this year for testing. (Automotive News, 7/13/92, p. 32)

Index Number: 116
Unique ID: 000037
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
Location(s): , CA, 09 U.S.A.
Companies: South Coast Air Quality Management District (SCAQMD)
California Air Resources Board (CARB)
Southwest Research Institute
Date: 05/01/92

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The SCAQMD, the California ARB, and SwRI conducted a study aimed at developing a low-concentration additive for neat methanol (M-100) that provides adequate cold starting, flame luminosity, lubricity properties, and safety without increasing engine wear or emissions. M-100 has the potential for use as a wide-scale motor fuel because of its clean-burning properties. Although M-100 is already used in methanol-powered transit buses, these buses use a compression-ignition engine that is not subject to the same cold-start constraints as passenger cars. Results of the study indicated that luminosity will require the addition of either four percent toluene plus two percent indan or five percent cyclopentene plus five percent indan to the fuel. (South Coast Air Quality Management District Technology Advancement Office Progress Report, 5/92, p. 36)

Index Number: 117
Unique ID: 000064
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
Location(s): Beaumont, TX, 06 U.S.A.
Companies: E.I. du Pont de Nemours (Du Pont)
Date: 03/25/92

The growth in demand for methanol is projected by some to be 7.4 percent per year through 1997; that strong demand growth is causing a reshuffle in the methanol business as companies look to add capacity or to cash in on the soaring value of methanol assets. Du Pont's Beaumont, TX, methanol plant, for example, sold for \$150 million; two years ago the best bid was \$27 million. (Chemical Week, 3/25/92, p. 42)

Index Number: 118
Unique ID: 000069
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
ethanol
ETBE
MTBE
Location(s): , , U.S.A.
, , Canada
Companies: Revolution Fuels of America
Blackstone Capital
Synthetic Energy
Date: 03/04/92

A newly patented technology, called multiple oxygenated production (MOP), integrates several fully commercialized turnkey processes to yield economical ethanol, methanol, and oxygenated fuels. MOP integrates the production of

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ethanol and methanol and, from them, high-value oxygenated fuel additives such as MTBE and ETBE. Revolution Fuels of America received a U.S. Patent for the technology and assigned it to Blackstone Capital, which licensed it back to Revolution and a Canadian company by the name of Synthetic Energy. (Inside R&D, 3/4/92)

Index Number: 119
Unique ID: 000073
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
MTBE
Location(s): , , New Zealand
Companies: Fletcher Challenge Ltd.
Date: 02/10/92

Experts at New Zealand-based Fletcher Challenge Ltd., a large methanol producer, think the 1990 Clean Air Act Amendments will boost demand for chemical-grade methanol for making MTBE in the United States. Japanese regulations also now require gasoline to contain 7 percent MTBE by volume. A global boom is expected in the next 3-5 years in demand for chemical-grade methanol with which to make MTBE, as European nations follow the lead of Japan and U.S. Fletcher Challenge has already signed a 10-year, \$45 million/yr contract to supply two Japanese companies with methanol. (Energy), Report, 2/10/92)

Index Number: 120
Unique ID: 000074
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
MTBE
Location(s): , , Saudi Arabia
Companies: Saudi Basic Industries Company (SABIC)
Ar-Razi
Ibn Sina
Ibn Zahr
Mobil Corporation
Date: 02/07/92

Saudi Basic Industries Company (Sabic) and its affiliates, predicting a world shortage of methanol and rising demand for MTBE, started up Ar-Razi's expanded methanol plant in January. The plant is now said to be the world's largest with a capacity of 1.27 million tons per year. Ibn Sina is now building a 700,000 ton-per-year MTBE plant, while Ibn Zahr plans to take its current output of 550,000 tons per year to 1.2 million tons per year. Further down the line are Mobil/Saudi Chemical investments with plans for an 800,000 tons

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per year plant and Himont/Xenel Industries with a 500,000 tons per year facility. (International Gas Report, 2/07/92)

Index Number: 121
Unique ID: 000271
Main Category: ALTERNATIVE FUELS
Projects Type(s): methanol
MTBE
Location(s): Sioux City, IA, 07 U.S.A.
Woodward, OK, 06 U.S.A.
Companies: Terra Industries
Haldor-Topsoe
Date: 12/07/92

Terra Industries Inc., Sioux City, IA, plans to co-produce methanol and ammonia at its Woodward, OK, nitrogen fertilizer plant. Terra will license technology from Haldor-Topsoe Inc. as part of the process. The \$15.5 million project is to be complete in the first quarter of 1994 and is to have capacity to produce 400 metric tons/day of methanol. The project includes new storage capacity, and Terra will consider investor partnerships or supply arrangements with MTBE producers. (Oil and Gas Journal, 12/7/92, p. 36)

Index Number: 122
Unique ID: 000001
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
catalytic technology
isobutylene
Location(s): Baton Rouge, LA, 06 U.S.A.
Companies: Exxon Company
CDTech
Date: 09/07/92

Exxon Co. U.S.A. broke ground in 1991 on a new 7,000 b/d MTBE unit at its refinery in Baton Rouge, LA. Start-up is projected for late 1992. Feed sources will include isobutylene from the refinery's fluid catalytic cracking unit (FCCU) and purchased methanol. Exxon is utilizing a catalytic distillation process developed by CDTech for MTBE synthesis. Also in Baton Rouge, Exxon Chemical America's chemical plant produces 3,000 b/d MTBE via the same method. MTBE product from the refinery is expected to exceed commercial specifications (i.e., more than 95 percent MTBE, less than 0.7 percent methanol). Exxon is blending a small amount of MTBE in its gasoline grades, exploring other oxygenate options, and is reportedly watching for catalysts being developed by some vendors to expand its FCC isobutylene production. (Oil and Gas Journal, 9/07/92, p. 39)

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Index Number: 123
Unique ID: 000002
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
isobutylene
Location(s): Norco, LA, 06 U.S.A.
, TX, 06 U.S.A.
Companies: TransAmerican Refining Corporation
ABB Lummus Crest
Date: 09/07/92

TransAmerican Refining Corp. in Norco, LA, is instituting a three-phase MTBE program, designed to reach 20,000-22,500 b/d capacity by 1994. During Phase I, the company will convert a Catofin dehydrogenation unit, previously used to manufacture butadiene, to bring 7,200 b/d MTBE capacity on-line by early 1993. The principal feedstock for producing isobutylene for the MTBE plant will be mixed field butanes purchased from South Louisiana or Mont Belvieu, TX. TransAmerican is also converting an old middle distillate hydrodesulfurization (HDS) unit to incorporate ABB Lummus Crest's butane isomerization technology, and this unit will be expanded from 4,000 to 7,200 b/d capacity for use in MTBE synthesis. TransAmerican plans to bring in two additional Catofin reactors for Phase 2 of the project by late 1993 to expand MTBE capacity. The Phase 3 expansion will involve starting up a previously shutdown Catofin unit, a new MTBE unit, and the expansion of isomerization capacity. (Oil and Gas Journal, 9/07/92, p. 40)

Index Number: 124
Unique ID: 000003
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
TAME
catalytic technology
Location(s): , TX, 06 U.S.A.
Companies: Diamond Shamrock Refining and Marketing Company
CDTech
Date: 09/07/92

Diamond Shamrock Refining & Marketing Co. is currently engineering a TAME plant, and feeding FCC-produced olefins to parallel the MTBE unit. The TAME plant, expected to be constructed in Texas by late 1993, will utilize CDTech's catalyst system. Diamond Shamrock is modifying its FCC cyclone system to produce more oxygenate feed. (Oil and Gas Journal, 9/07/92, p. 40)

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Index Number: 125
Unique ID: 000004
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
methanol
natural gas
Location(s): Cheyenne, WY, 08 U.S.A.
Companies: Coastal Corporation
Engelhard
Phillips 66 Company
ICI
Date: 09/07/92

Two Coastal Corp. subsidiaries are building a plant providing 4,000 b/d MTBE capacity in Cheyenne, WY. The plant's feed sources will be field-grade butanes, which will be isomerized through Engelhard's process, and isobutane which will be dehydrogenated using Phillips 66 Co.'s STAR process. Coastal will also use ICI's technology to produce methanol from natural gas, and Phillips' process to synthesize MTBE. The project is expected to take one year with a startup date of early September 1993. (Oil and Gas Journal, 9/07/92, p. 41)

Index Number: 126
Unique ID: 000006
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
TAME
Location(s): Corpus Christi, TX, 06 U.S.A.
Companies: Valero Refining and Marketing Company
UOP
Fluor Daniel Inc.
Date: 09/07/92

Valero Refining & Marketing Co. has 2,000 b/d MTBE capacity at its Corpus Christi, TX, refinery. Its process removes butadiene from the alkylation unit feedstock. This improves alkylate quality and reduces acid consumption while producing MTBE. Valero broke ground on a \$230 million butane upgrade/MTBE project in January, 1992. The 13,000 b/d facility is expected to begin operating by the second quarter of 1993. Valero will use UOP's Butamer, Oleflex, and Huls processes for isomerization, dehydrogenation, and MTBE synthesis and methanol feedstock will be purchased from Gulf Coast manufacturers under a term contract. The butane upgrade project will employ a workforce of about 800 during construction and, when completed, will entail about 34 permanent jobs. The contractor on the project is Fluor Daniel, Inc. In addition to the 50,000 bbl MTBE storage capacity it already has, the

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refinery will add another 120,000 bbl of MTBE storage. Valero also has a TAME unit in the permitting process. (Oil and Gas Journal, 9/07/92, p. 36)

Index Number: 127
Unique ID: 000024
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
reformulated gasoline
Location(s): , ,
Companies: Mobil Corporation
BP Oil Company
Date: 07/01/92

Mobil Corp. and BP Oil Co. are jointly developing a new proprietary process, Isofin, to produce feedstocks for oxygenates, such as MTBE, which are mandated by the Clean Air Act for reformulated gasoline. The new technology is expected to increase production of MTBE from refinery sources of butenes. (Energy Alert, 7/1/92)

Index Number: 128
Unique ID: 000049
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
catalytic technology
Location(s): Edison, NJ, 02 U.S.A.
, , Japan
, , Singapore
, , Korea
Companies: H-R International Inc.
Outokumtu Oy
Date: 04/20/92

H-R International Inc. (Edison, NJ), a subsidiary of Outokumtu Oy, has arranged to offer turnkey MTBE plants in the U.S. based on Sumitomo technology developed in Japan in the early 1980s. H-R's offering is specifically focused on the niche market for medium-sized 2,000 barrel-per-day MTBE plants using the FCC unit isobutylene cut. Four plants have been licensed to date two in Japan, one in Singapore, and a fourth plant under construction in Korea. H-R plans to offer specialty process plants ranging from \$5 million to \$25 million total installed cost. (Chemical Marketing Reporter, 4/20/92)

Index Number: 129
Unique ID: 000057
Main Category: ALTERNATIVE FUELS

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Projects Type(s): MTBE
Location(s): Cheyenne, WY, 08 U.S.A.
La Porte, TX, 06 U.S.A.
Houston, TX, 06 U.S.A.
Corpus Christi, TX, 06 U.S.A.
Alberta, , Canada
Companies: Coastal Corporation
Alberta Envirofuels
Enron
Global Octanes/Mitsui
Valero Energy
Date: 03/30/92

Proposed isomerization/dehydrogenation facilities generally produce about 12,000 barrels per day of MTBE and represent an investment of between \$150 and \$300 million. To date, five such units are going up in North America: Alberta Envirofuels' project in Edmonton, Alberta, is scheduled to come on line in April, 1992; Coastal Chemical's unit in Cheyenne, WY, is scheduled to come on line in Spring of 1992; Enron is completing construction on a former Tenneco unit in La Porte, TX, which is slated to start up in the third quarter of 1992; the Global Octanes subsidiary of Mitsui also plans to bring on its Houston facility later in 1992; and the fifth project Valero Energy's Corpus Christi unit is expected to start up in 1993. (Chemical Marketing Reporter, 3/30/92, p. SR16)

Index Number: 130
Unique ID: 000058
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Port Neches, TX, 06 U.S.A.
Companies: Texaco Chemical
M.W. Kellogg
Brown & Root Braun
Date: 10/12/92

M.W. Kellogg and Brown & Root Braun began building an MTBE plant expansion at Port Neches, TX, in October 1992, for Texaco Chemical Co. Engineering with completion expected in 1994. MTBE production at the plant will increase from 10,000 b/d to 25,000 b/d. The plant will also produce 400 million lb/year propylene oxide. The process used to produce MTBE, developed at Texaco Chemical's Austin TX, research lab, takes one of the intermediate products from the manufacture of propylene oxide and in a one step process with methanol, creates MTBE. This process will reportedly give the Texaco plant a decided economic advantage in the manufacture of MTBE. (Oil and Gas Journal, October 5, 1992, p. 34; Chemical and Engineering News, October 12, 1992, p. 14; and Chemical Marketing Reporter, October 12, 1992, p.3)

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Index Number: 131
Unique ID: 000059
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Morris, IL, 05 U.S.A.
Companies: Freedom Envirofuels
Date: 03/30/92

Freedom Envirofuels plans to build a 12,500 barrels per day MTBE plant at Morris, IL. The project has already secured raw material suppliers, but is still in the stage of obtaining off-take contracts. (Chemical Marketing Reporter, 3/30/92, p. SR16)

Index Number: 132
Unique ID: 000060
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Mont Belvieu, TX, 06 U.S.A.
Houston, TX, 06 U.S.A.
The Woodlands, TX, 06 U.S.A.
Philadelphia, PA, 03 U.S.A.
Companies: Belvieu Environmental Fuels
Enterprise Products
Mitchell Energy and Development
Sun Refining and Marketing
Texas Air Control Board (TACB)
Date: 03/30/92

A 12,000 barrel per day MTBE plant is being planned for Mont Belvieu, TX, by Belvieu Environmental Fuels, a joint enterprise of Enterprise Products, Houston, TX, Mitchell Energy & Development, The Woodlands, TX, and Sun Refining & Marketing, Philadelphia, PA. The Texas Air Control Board is expected to approve the \$200 million project, whose output will go solely to Sun, and which is scheduled to start up in 1994. (Chemical Marketing Reporter, 3/30/92, p. SR9)

Index Number: 133
Unique ID: 000061
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
isobutylene
Location(s): Mont Belvieu, TX, 06 U.S.A.
Companies: Warren Petroleum

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Date: 03/30/92

Warren Petroleum is building a 30,000 barrel per day, \$50 million isomerization unit in Mont Belvieu, TX, to obtain isobutylene precursor isobutane from n-butane because naturally occurring isobutylene is in short supply for use in producing MTBE. In this process, isobutanes are split to isobutylene and n-butane is isomerized to make even more isobutane for splitting to isobutylene. Isobutane product is then split to isobutylenes in three roughly equal units totaling 170,000 barrels daily, all of which is contracted for by MTBE producers. The Warren facility is scheduled to come on line in 1993. (Chemical Marketing Reporter, 3/30/92, p. SR9)

Index Number: 134
Unique ID: 000066
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): , , Saudi Arabia
Companies: Union Carbide
National Commercial Bank
Riyad Bank
Saudi American Bank
Date: 03/23/92

A \$500 million loan syndication was arranged by National Commercial Bank, Riyadh Bank, Saudi American Bank, and Al Bank Al Saudi Al Fransi to finance the cost of building a new MTBE unit and a polypropylene plant with a capacity of 200,000 tons/yr in Saudi Arabia. (APS Review Gas Market Trends, 3/23/92, V. 38, No. 11)

Index Number: 135
Unique ID: 000067
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Beaumont, TX, 06 U.S.A.
Jubail, , Saudi Arabia
Companies: Texas Eastern
Saudi Basic Industries Company (SABIC)
Date: 03/23/92

U.S. companies involved in Middle East ventures are optimistic about the prospects for MTBE as they target the U.S. as the main market. Texas Eastern is a leader among them, being a partner in SABIC's new 700,000 tons/yr. project at Jubail, Saudi Arabia, and has the first pipeline in the U.S. to transport MTBE from Beaumont, TX, to the midwest. (APS Review Downstream Trends, 3/23/92, p. N/A)

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Index Number: 136
Unique ID: 000068
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Wood River, IL, 05 U.S.A.
Lorco, LA, 06 U.S.A.
Deer Park, TX, 06 U.S.A.
Companies: Shell Oil Company
Foster Wheeler USA
Date: 11/02/92

Shell Oil Co. hired Foster Wheeler USA Corp. to design and procure two MTBE units at its Deer Park, TX, and Lorco, LA, refineries. The two units, with combined capacity of 11,000 b/d, are to start up in late 1993 or early 1994. Foster Wheeler will complete work by mid-1993. Shell tabled plans for MTBE capacity at its Wood River, IL, refinery. (Oil and Gas Journal, 11/2/92, p. 43)

Index Number: 137
Unique ID: 000071
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Edmonton, , Canada
Companies: Chevron Canada Limited
Neste Canada Inc.
Petro-Canada
Alberta Envirofuels
Chevron U.S.A.
Date: 02/01/92

Chevron Standard Limited, an affiliate of Chevron Canada Limited and Neste Canada Inc., have subject to regulatory approval jointly agreed to purchase Petro-Canada's interest in Alberta Envirofuels Inc. Neste and Chevron Standard will each have a one-half equity interest. In April 1991, the 3 companies announced a joint venture in which each company would hold a one-third interest in an MTBE plant to be built by Alberta Envirofuels in Edmonton. Chevron U.S.A. will obtain a supply of the MTBE through an agreement with Chevron Standard. Completion of the approximately \$395 million plant, which can produce 12,000 barrels a day of MTBE from Alberta butane and methanol, is expected by the end of 1992. (Worldwide Energy, 2/92)

Index Number: 138
Unique ID: 000077

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Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Robinson, IL, 05 U.S.A.
Detroit, MI, 05 U.S.A.
Garyville, LA, 06 U.S.A.
Texas City, TX, 06 U.S.A.
Companies: USX-Marathon
Date: 01/29/92

USX-Marathon completed its second MTBE unit at its Robinson, IL, refinery. The first unit was constructed at its Detroit refinery with plans for additional units in Garyville, LA, and Texas City, TX. The demand for MTBE is expected to triple over the next few years as a result of the Clean Air Act amendments. (Energy, Alert, 1/29/92)

Index Number: 139
Unique ID: 000080
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
reformulated gasoline
Location(s): Richmond, VA, 03 U.S.A.
Washington, DC, 03 U.S.A.
Baltimore, MD, 03 U.S.A.
Companies: Amoco Oil Company
Date: 11/11/91

Amoco is offering an oxygenated fuels slate in Richmond, Northern Virginia, Washington, D.C., and Baltimore. The fuel meets the wintertime oxygenate requirement of the amended Clean Air Act. All three unleaded grades contain 15 percent MTBE and will produce 23 percent fewer carbon monoxide emissions than gasoline containing no oxygenates. (Oil Express, 11/11/91)

Index Number: 140
Unique ID: 000254
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Morgan's Point, TX, 06 U.S.A.
Pasadena, TX, 06 U.S.A.
Companies: Enron
M.W. Kellogg
Date: 12/21/92

Enron Corp. dedicated its 15,000 b/d MTBE plant at Morgan's Point, TX, on Nov. 1, 1992. The plant will receive isobutane feed stock from an Enron isomerization unit at Morgan's Point and methanol from an Enron plant at

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Pasadena, TX. M.W. Kellogg handled engineering, procurement, and construction of the facility. (Oil and Gas Journal, 12/21/92, p. 38)

Index Number: 141
Unique ID: 000255
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Pasadena, CA, 09 U.S.A.
Richmond, CA, 09 U.S.A.
Pascogoula, MS, 04 U.S.A.
Companies: Chevron U.S.A.
Jacobs Engineering Group
Date: 12/28/92

Chevron USA Products Co. started up a 2,100 b/d MTBE unit at its Pascogoula, Miss., refinery that was designed by Jacobs Engineering Group Inc. of Pasadena, CA. The company was also contracted to engineer and build a 2,050 b/d MTBE unit at Chevron's Richmond, CA, refinery. The unit is expected to start up by February, 1993. (Oil and Gas Journal, 10/26/92, p. 40 and 12/28/92, p. 27)

Index Number: 142
Unique ID: 000259
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
isobutylene
Location(s): Deer Park, TX, 06 U.S.A.
Companies: Global Octanes/Mitsui
ABB Lummus Crest
Date: 11/16/92

Global Octanes Corp. started up a dehydrogenation plant producing isobutylene for MTBE. The 12,5000 b/d MTBE plant at Deer Park, TX, uses ABB Lummus Crest Inc.'s catofin dehydrogenation technology. Lummus Crest provided basic engineering, precommissioning, commissioning, and start up assistance for the \$200 million project. (Oil and Gas Journal, 11/16/92, p. 38)

Index Number: 143
Unique ID: 000266
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): , , Mexico
Companies: Productos Ecologicos SA (Proesa)
Petroleos Mexicanos

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Valero Energy
Promociones Industriales Banamex SA (Pibsa)
Grupo Infomin SA

Date: 10/05/92

Productos Ecologicos SA de CV (Proesa) joint venture partners agreed with Petroleos Mexicanos to build a 13,000 b/d MTBE plant in Mexico with start-up expected in late 1995. Proesa partners are Valero Energy Corp. and Promociones Industriales Banamex SA de CV (Pibsa), Grupo Infomin SA de CV, and Dragados Construcciones SA. (Oil and Gas Journal, 10/5/92, p. 34)

Index Number: 144
Unique ID: 000270
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
ethylene
Location(s): Jabail, , Saudi Arabia
Houston, TX, 06 U.S.A.
Companies: Sadaf
Saudi Basic Industries Company (SABIC)
Shell Oil Company
Pecten Arabian
Brown & Root
Date: 12/14/92

Sadaf, a joint venture of Sabic and Shell Oil Co. affiliate Pecten Arabian Co., named two units of Brown & Root, Houston, managing contractors of an expansion program of petrochemical facilities at Jabail. Brown & Root Braun and Brown & Root Saudi Ltd. will issue major engineering, construction, and procurement contracts, oversee and/or perform facility design, and manage construction of expansions of ethylbenzene/styrene and chlor alkali/ethylene dichloride plants and construction of a grassroots MTBE unit. Value and timing of the work have not been reported. (Oil and Gas Journal, 12/14/92, p. 31)

Index Number: 145
Unique ID: 000274
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): , ,
Companies: Oxy-Chem
Date: 09/16/92

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Oxy-Chem reportedly plans to increase its MTBE production by building a 64,000 b/d production unit at its Chocolate Bayou facility. (Chemical Week, 9/16/92, p. 23)

Index Number: 146
Unique ID: 000275
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): , ,
Companies: UOP
Huls
Koch Engineering
Date: 09/09/92

UOP recently improved its Huls' MTBE technology with a reactive distillation step called Ethermax, which was developed by Koch Engineering. (Chemical Week, 9/9/92, P. 28)

Index Number: 147
Unique ID: 000280
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
TAME
Location(s): Convent, LA, 06 U.S.A.
Delaware City, DE, 03 U.S.A.
Companies: Texaco
Saudi Aramco
Star Enterprise
Date: 10/12/92

A joint refining venture between Texaco and Saudi Aramco, Star Enterprise, has ongoing construction projects for 5,000 barrels daily of MTBE and tertiary amylmethyl ether at its Convent, LA, refinery and a similar facility at Delaware City, Del., both due to be finished in early 1993. (Chemical Marketing Reporter, 10/12/92, p. 3)

Index Number: 148
Unique ID: 000312
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): Mont Belvieu, TX, 06 U.S.A.
Companies: Enterprise Products
UOP
Date: 11/30/92

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Enterprise Products Co., Houston, has commissioned its third UOP Butamer process unit for butane isomerization at Mont Belvieu, TX. The plant has a rated capacity of 30,000 b/d of high purity isobutane and will supply feedstock for alkylate and MTBE production. (Oil and Gas Journal, 11/30/92, p. 37)

Index Number: 149
Unique ID: 000331
Main Category: ALTERNATIVE FUELS
Projects Type(s): MTBE
Location(s): New Orleans, LA, 06 U.S.A.
Companies: TransAmerican Refining Corporation
Date: 11/23/92

TransAmerican Refining Corp., which owns the former 300,000 b/d Good Hope refinery near New Orleans, has reportedly increased efforts to expand and refurbish the refinery. The refinery also hopes to produce 13,000 b/d of MTBE. It is not clear whether the facility will be granted permits to begin these expansions. (Oil Price Information Service, 11/23/92, v, 1, No. 47)

Index Number: 150
Unique ID: 000012
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
Location(s): , , U.S.A.
Companies: Chrysler Corporation
Federal Express
United Parcel Service
Cummins Engine Company
Detroit Diesel Corporation (DDC)
Date: 08/03/92

Utility firms and natural gas organizations are reportedly spending \$25 million to promote the development and use of CNG vehicles. The industry has also been expanding its infrastructure, increasing the number of CNG refueling stations nationwide by nearly 50 percent in little over a year. This has fueled interest in automakers for developing CNG vehicles, particularly for fleet use. From February 1991 to April 1992, 156 new natural gas refueling facilities were added to the 328 already in operation, and 27 more are being planned. GMC was the first equipment manufacturer to offer natural gas trucks to utility and private fleets. Chrysler Corp. has developed a natural gas-powered, full-sized B-van with a 5.2-liter, V-8 engine for commercial applications. Chrysler is planning to sell 492 units in 1992. Fleet operators experimenting with natural gas vehicles include Federal Express and

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United Parcel Service. Interest in CNG's progress extends beyond the natural gas and automaking industries. Many engine, heavy-truck, and bus makers, such as Cummins Engine Co. Inc., Detroit Diesel Corp., Tecogen Inc., Hercules Engines Inc., Caterpillar Inc., and Fixible Corp., have expressed interest in CNG vehicles. (Automotive News, 8/3/92, p. 3)

Index Number: 151
Unique ID: 000033
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
Location(s): , ,
Companies:
Date: 05/12/92

Stations offering compressed natural gas (CNG) have been opening at a rate of three per week in preparation for new clean air requirements. Benefits of CNG include its price (about 70 cents per equivalent gallon) and burning properties that would allow engine oil to last 50,000 miles and spark plugs to last 75,000 miles. Its outstrips gasoline in auto safety and emissions; predicted reserves in the lower 48 states could last 50 years and supply networks are already in place. Some predict that by decade's end, 25 to 50 million vehicles in the U.S. will be operating on CNG and that half of the growth will come from 15 to 30 million fleet vehicles. (Christian Science Monitor, 5/12/92)

Index Number: 152
Unique ID: 000078
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
MTBE
Location(s): , , U.S.A.
Companies: Western Resources
Date: 01/22/92

Liquid natural gas properties are reported to be selling at a relatively robust 5.5 to 7.5 times pretax cash flow. The reason: liquid natural gas can be made into clean-burning fuels such as ethane, propane, normal butane, isobutane, and natural gasoline that can be substituted for heavier, dirtier petroleum products. New petrochemical plants require fuels for which propane, ethane, and butane are feedstocks. Three such new chemical plants that are to be built along the U.S.'s Gulf of Mexico coast will require 100,000 barrels of liquid natural gas a day. In addition, reformulated gas is mandated for several U.S. cities by 1995; MTBE is a chief ingredient of reformulated gas. Reflecting this trend, the stocks of liquid natural gas companies rose a reported 41 percent in 1991 as a group. Western Resources, a liquid natural

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gas provider, successfully went public in recent months. (Investext, 1/22/92, p. 1-2)

Index Number: 153
Unique ID: 000083
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
reformulated gasoline
Location(s): Houston, TX, 06 U.S.A.
Companies:
Date: 08/26/91

The employment picture could improve considerably for petrochemical workers in Houston. Already three new plants for making the additive for reformulated gasoline are planned for the Houston area. The additive is made from natural gas liquids, which will give the industry a boost. Also oil imports are expected to drop by 300,000 barrels per day when the new gas is in full production. (Houston Post, 8/26/91)

Index Number: 154
Unique ID: 000257
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
natural gas vehicle (NGV)
Location(s): Austin, TX, 06 U.S.A.
Mexico City, , Mexico
Monterrey, , Mexico
Guadalajara, , Mexico
Companies: Southern Union Energy International
Grupo Diavaz
Gas Automotors SA de CV
Date: 11/16/92

Southern Union Energy International Inc., Austin, and Grupo Diavaz SA de CV, Mexico City, opened the first natural gas refueling station in Mexico Nov. 9, 1992, at Monterrey. They also reportedly plan to open refueling stations in Mexico City and Guadalajara. The two companies formed a joint venture, Gas Automotors SA de CV, to open CNG refueling stations and vehicle conversion facilities in Mexico. (Oil and Gas Journal, 10/19/92, p. 41 and 11/16/92, p. 38)

Index Number: 155
Unique ID: 000263
Main Category: ALTERNATIVE FUELS

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Projects Type(s): natural gas
Location(s): , , Argentina
Denver, CO, 08 U.S.A.
Companies: Marcum Natural Gas Services
Gas del Estado
Date: 10/19/92

Marcum Natural Gas Services Inc., of Denver, CO, received approval to market its compressed natural gas dispenser (CNG) in Argentina. It estimates as many as 2,000 CNG refueling stations will be built in Argentina in the next 5 years, resulting in the need for 6,000-12,000 CNG dispensers. The company reportedly wants to capture 25% of that market. Marcum's first dispenser installation with state gas company Gas del Estado was to be shipped by early November 1992. Argentina has increased the number of CNG refueling stations to 260 from 50 in the past 5 years. (Oil and Gas Journal, 10/19/92, p. 41)

Index Number: 156
Unique ID: 000332
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
Location(s): Woodlands, TX, 06 U.S.A.
Overland Park, KS, 07 U.S.A.
Mont Belvieu, TX, 06 U.S.A.
Companies: Gulf Coast Fractionators (GCF)
Trident NGL Inc.
MND Energy Corporation
Pritchard Corporation
Date: 01/11/92

Gulf Coast Fractionators (GCF), a joint venture of Trident NGL Inc. and MND Energy Corp., both of Woodlands TX, let a \$33 million engineering and construction contract to Pritchard Corp, Overland Park, KS, to add 40,000 b/d of capacity to GCF's 80,000 b/d natural gas liquids fractionation plant in Mont Belvieu, TX. The expansion reportedly will be complete in late 1994. (Oil and Gas Journal, 1/11/93, p. 25)

Index Number: 157
Unique ID: 000400
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas
Location(s): , , Venezuela
Companies: Lagoven
Petroleos de Venezuela
Royal Dutch/Shell
Exxon Company

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Mitsubishi
Date: 02/08/93

After settling a dispute over protection of technology, the \$3 billion Cristobal Colon liquified natural gas (LNG) project in Venezuela is reportedly active again. The project, which involves developing gas fields in the Gulf of Paria off eastern Venezuela and exporting the gas as LNG to the U.S. and Europe includes offshore production facilities, a subsea pipeline to shore, port facilities, and a liquefaction plant with 4.6 metric tons per year capacity. Lagoven SA (a unit of Petroleos de Venezuela SA), Royal Dutch/Shell Group, Exxon Corporation, and Mitsubishi Corporation are participating in the project. (Oil and Gas Journal, 2/8/93, p. 33)

Index Number: 158
Unique ID: 000010
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
Location(s): Farmington, NM, 06 U.S.A.
Companies: Amoco Oil Company
Date: 08/24/92

Amoco opened a refueling station dedicated solely to compressed natural gas (CNG) at Farmington, NM. The outlet will serve both fleets and individuals. In addition, Amoco's southern Rockies business unit is converting 200 vehicles to operate on CNG and is negotiating with area fleet owners to convert their vehicles to CNG. (Oil and Gas Journal, 8/24/92, p. 24)

Index Number: 159
Unique ID: 000026
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
propane
Location(s): Oklahoma City, OK, 06 U.S.A.
Tulsa, OK, 06 U.S.A.
New York City, NY, 02 U.S.A.
Dallas, TX, 06 U.S.A.
, , Canada
Companies: United Parcel Service
Date: 01/18/93

UPS announced that it is planning to fuel 140 of its Oklahoma City and Tulsa fleet vehicles with natural gas. The company is also experimenting with NGVs in Dallas, New York City, Washington, D.C., and other major cities. (Plants, Sites and Parks, 6/92) UPS is converting 70 percent of its Canadian fleet to propane. In the US, UPS has been testing vehicles powered by liquified

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natural gas in eight cities for the past two years. (Traffic World 1/18/93, p. 23) UPS is operating 15 natural gas trucks in a Dallas trial. (Alternative Energy Network Online Today 2/4/93)

Index Number: 160
Unique ID: 000027
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
Location(s): Charleston, WV, 03 U.S.A.
Glenville, WV, 03 U.S.A.
Companies: Natural Gas Transportation Company
Eastern American Energy Corporation
Date: 06/01/92

Natural Gas Transportation Company (Charleston, WV), a subsidiary of Eastern American Energy Corp. operates 60 NGVs throughout the West Virginia and opened the first public natural gas filling station in the state last October. This past March, the company opened another filling station in Glenville, and plans to operate another 25 stations in the state by late 1993. (Plants, Sites and Parks, 6/92)

Index Number: 161
Unique ID: 000028
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
ethanol
Location(s): Wichita, KS, 07 U.S.A.
Companies: Kansas Corporation Commission
Chevrolet
Date: 06/01/92

The Kansas Corporation Commission's recently acquired compressed natural gas (CNG) bi-fuel vehicle was the training car for Wichita's "Run for the Cure." The 1992 Chevrolet Lumina was used to demonstrate the practicality of using CNG as a vehicular fuel. When the bi-fuel Lumina is not operating on CNG, it runs on a 10 percent ethanol-blend fuel. The car's range is approximately 300 miles operating exclusively on CNG and increases to a total range of around 860 miles when the 10 percent ethanol gasoline blend tank is also used. (Worldwide Energy, 6/92)

Index Number: 162
Unique ID: 000045
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)

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Location(s): Houston, TX, 06 U.S.A.
Companies: Enron
Enfuels
Transco Energy Co.
Entex
AutoGas Systems
Date: 10/05/92

Enfuels, a joint venture between Enron Corp., Transco Energy Co., Entex Inc., and AutoGas Systems Inc., and O'Rourke, plans to build six compressed natural gas fueling stations in the Houston area, with the first station opening in Houston by June 1992 and five more expected to be in operation by the end of the year. It is the second phase of Enfuels' program to establish a city-wide CNG infrastructure. Enfuels reportedly plans to provide conversions, emissions validation, and training to maintenance and converter personnel at its Natural Gas Vehicle Technology Center, which was set to open in October, 1992. Liquified natural gas may be the alternative fuel of choice for diesel buses in Houston because it allows greater driving range. Most compressed natural gas pumps will be at existing gasoline retail stations. In July, Enron planned open a technology conversion center where customers can convert gasoline vehicles into natural gas vehicles. Natural gas vehicles are reputed to produce fewer of the precursors to smog formation, eliminate evaporative hydrocarbons, produce 5 percent of the CO produced by gasoline engines, achieve low cold start emissions, and eliminate particulate emissions. Some challenges to the industry include the lack of fueling stations; a reduced driving range; the development of low-cost, light-weight tanks; and the need for compressed natural gas-specific fuel injection systems, catalysts, and engines to meet future emissions requirements. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92 and Oil and Gas Journal, October 5, 1992, p. 40)

Index Number: 163
Unique ID: 000046
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
Location(s): , , U.S.A.
Companies: General Motors Corporation
Date: 04/22/92

GMC has introduced a Sierra-class pickup truck featuring the first in a new generation of electronic fueling systems for the use of natural gas. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 164
Unique ID: 000047

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Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
combustion technology
Location(s): , , U.S.A.
Companies: Chrysler Corporation
Date: 04/22/92

Chrysler is producing full-sized compressed natural gas vans that utilize what Chrysler claims is the cleanest internal combustion engine available. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 165
Unique ID: 000053
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
Location(s): , WV, 03 U.S.A.
Companies: National Center for Alternate Transportation Fuels
Hercules Materials Company
West Virginia University
Date: 04/06/92

Hercules Materials Company is in the early stages of evaluating the feasibility of one new-age automotive application aimed at natural gas vehicles. The company is working with West Virginia University, headquarters of the National Center for Alternate Transportation Fuels, to develop high-strength fuel tanks that are reinforced with carbon fiber as a long-term alternative to current steel designs. These tanks are reported to weigh as much as 60 percent less than traditional steel tanks, while holding up to 20 percent more fuel. The company believes that cost-competitive carbon fiber-wound tanks are attainable within the next three years and that these new tanks will become a key component of natural gas vehicles demand for which is predicted to reach well over 2 million by the year 2000 in the U.S. as entire fleets of pickup trucks, delivery vans, heavy-duty utility trucks, and buses are converted from gasoline, diesel, and methanol to alternate fuels. (Chemical Marketing Reporter, 4/06/92, p. 21)

Index Number: 166
Unique ID: 000081
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
reformulated gasoline
methanol
Location(s): , CA, 09 U.S.A.
, NY, 02 U.S.A.
Companies: Detroit Diesel Corporation (DDC)

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Consolidated Edison
Brooklyn Union Gas Company
General Motors Corporation
Gas Research Institute (GRI)
10/01/91

Date:

An immediate goal of the Clean Air Act is to cut VOC emissions 15 percent by 1995 through use of reformulated gasoline. Other aspects require that alternative fuels power 25 percent of the vehicle miles traveled by the year 2005. In August, Federal and California officials gave approval to Detroit Diesel Corporation to begin selling a methanol-fueled version of its Series 92 diesel engines used in transit buses and trucks. Compressed natural gas (CNG) is another alternative to gasoline: Consolidated Edison of New York and Brooklyn Union Gas Co. both operate experimental natural gas-powered vehicles. In addition, General Motors Truck & Bus Group recently entered into a \$40 million contract with the Gas Research Institute to develop full-sized light and medium-duty trucks powered by dedicated compressed natural gas fuel. (Chemical Business, 10/91)

Index Number: 167
Unique ID: 000267
Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
Location(s): , WV, 03 U.S.A.
, AZ, 09 U.S.A.
, MD, 03 U.S.A.
, MO, 07 U.S.A.
, NM, 06 U.S.A.

Companies:

Date: 10/05/92

Ten states and the District of Columbia will participate in a pilot program to test the performance of CNG school buses. The program began in 1992 with eight CNG-powered school buses being delivered to Wood County, WV. Winners and grants from the DOE's alternative fuels test program are: Arizona, \$66,000; Maryland, \$78,200; Kentucky, \$68,000; Missouri, \$54,000; New Mexico, \$90,972; New York, \$64,936; Pennsylvania, \$66,200; Vermont, \$33,197; Utah, \$78,200; West Virginia, \$45,000; and the District of Columbia, \$98,000. The grants will pay for the difference in cost between conventional and alternative-fueled buses. The projects will help determine how alternative-fueled vehicles perform in various climates, altitudes and terrains. (Oil and Gas Journal, 10/5/92, p. 40)

Index Number: 168
Unique ID: 000330

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Main Category: ALTERNATIVE FUELS
Projects Type(s): natural gas vehicle (NGV)
electric vehicle
clean fuels - other
methanol
Location(s): New York, NY, 02 U.S.A.
Companies: Brooklyn Union Gas Company
Brooklyn Navy Yard
Edison Company of New York
New York City Department of the Environment
Date: 11/08/92

By mid-1993, New York City plans to have a fleet of over 500 alternatively fueled vehicles. Brooklyn Union Gas Co. has begun building a natural gas fueling station near the Brooklyn Navy Yard and consolidated Edison Co. of New York is building another on the Hudson River near Greenwich Village. Under municipal contract, each utility is training city mechanics to convert 350 gasoline-burning vehicles to alternative fuels. Reports are that five battery-powered electric vans are being used by the Department of Environmental Protection; over a dozen methanol-fueled buses are operating in Queens; the U.S.'s first natural gas-powered street sweeper will operate on Staten Island; and seven cleaner-burning garbage trucks will be added to the one currently operating in Brooklyn. In fiscal year 1994, city procurement plans call for 30% of the 1,400 new light-duty, non-emergency vehicles bought annually to be run on cleaner-burning fuels. The city procurement goal is 60% for 1995 and 80% for 1996. It is expected that the bulk of the city's fleet will be operating on CNG by the turn of the century. (Crain's New York Business, 11/8/92 p. 57)

Index Number: 169
Unique ID: 000019
Main Category: ALTERNATIVE FUELS
Projects Type(s): propane
natural gas vehicle (NGV)
VOCs
Location(s): , DE, 03 U.S.A.
Companies: Department of Natural Resources and Environmental Control
Ford Motor Co.
Date: 07/14/92

Delaware's Department of Natural Resources and Environmental Control will convert two 1991 Ford Crown Victorias at a cost of \$1,700 each to run on alternative fuels. One car will utilize propane, while the other will use compressed natural gas. With the flip of a switch, the drivers can convert from conventional gasoline to the alternative fuel. The switch should reduce

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VOCs by 70 percent compared to conventional gas-burning automobiles. In addition, the cars should require less maintenance and have improved engine response. The move was made in order to meet the requirements of the 1990 CAA. (Alternative Energy Network Online Today, 7/14/92)

Index Number: 170
Unique ID: 000082
Main Category: ALTERNATIVE FUELS
Projects Type(s): propane
VOCs
Location(s): Denver, CO, 08 U.S.A.
Companies: Conoco
Date: 10/01/91

As part of the drive to develop alternatives for traditional fuels in order to cut VOC emissions, some Denver Conoco stations began selling propane for use in motor vehicles in August, 1991. (Chemical Business, 10/91, p.33)

Index Number: 171
Unique ID: 000044
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
Location(s): , CA, 09 U.S.A.
Companies: ARCO
California Air Resources Board (CARB)
Date: 04/22/92

ARCO's EC-X, a reformulated gasoline that meets the California Air Resources Board (CARB) standard for Phase II gasoline, provides evidence that reformulated gasoline shows great promise to compete in the areas of environmental quality, energy efficiency, ease of implementation, and economic efficiency. ARCO estimates that the overall reduction in urban ozone formation would be 39 percent through the use of reformulated gasoline. Phase II gasoline also offers the advantage of achieving mandated emissions reductions without requiring new engine technology. EC-X is estimated to cost 16 cents per gallon more than conventional gasoline, but reportedly compares favorably with M85. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 172
Unique ID: 000075
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
catalysts

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Location(s): Porvoo, , Finland
Mountain View, CA, 09 U.S.A.
Companies: Neste
Conoco
Catalytica
Date: 02/06/92

Conoco, Catalytica (Mountain View, CA) and Neste (Finland) will build a joint venture pilot plant to produce high-octane gasoline using a solid catalyst. The plant, located at Neste's research center in Porvoo, Finland, is expected to produce reformulated gasolines that are required by the Clean Air Act more economically than liquid acid catalyst alkylation units. (Journal of Commerce, 2/06/92, p. 7A)

Index Number: 173
Unique ID: 000084
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
Location(s): Pittsburgh, PA, 03 U.S.A.
Companies: Air Products & Chemicals
Department of Energy
Date: 08/02/91

Oxygenating gasoline additives have been economically derived from coal in Department of Energy-sponsored research. The process involves the conversion of coal-derived gases into dimethyl-ether in one step. Dimethyl-ether is an essential ingredient for oxygen-rich additives in gasoline that will make compliance with the stricter Clean Air Act requirements possible by 1995 (when 25 percent of all US gasoline must contain oxygenates). While previous research had concentrated on natural gas, petroleum, or ethanol derived oxygenates, the DOE-sponsored project showed that coal can be a cost-effective source. The process was developed by Air Products & Chemicals scientists in Pittsburgh, PA. (Wall Street Journal, 8/02/91, p. B1)

Index Number: 174
Unique ID: 000261
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
modeling (computer)
Location(s): , ,
Companies: Pace Consultants Inc.
Haverly Systems
Date: 11/16/92

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Pace Consultants Inc. has developed a comprehensive Linear Programming Model for the development of reformulated and California Air Resources Board (CARB)-type specification fuel. The model, designed for personal computers, uses the Pace Refinery Data Base and the Generalized Refining-Transportation-Marketing Planning System, which is licensed from Haverly Systems. Pace has incorporated extensive data on the properties of blending components and increased the flexibility and structure of the program to create a system capable of running models that meet present and future reformulated and CARB-specified fuel requirements. (Oil and Gas Journal, 11/16/92, pp. 41-44)

Index Number: 175
Unique ID: 000272
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
diesel technology
SO2 controls
Location(s): Blue Bell, PA, 03 U.S.A.
Lawrenceville, IL, 05 U.S.A.
Companies: Indiana Refining LP
Castle Energy Corp.
Salmon Resources
Date: 12/07/92

Indiana Refining LP, a unit of Castle Energy Corp., Blue Bell, PA, plans to spend about \$57 million on projects at its 67,000 b/d Lawrenceville, IL, refinery. Plans include increasing capacity to 85,000 b/d, which would facilitate the refinery's ability to process condensate delivered by Salmon Resources Ltd. It would also aid in compliance with guidelines for ultra low sulfur diesel fuel and reformulated gasolines, and increasing the plant's capability to run sour crudes. (Oil and Gas Journal, 12/7/92, p. 36)

Index Number: 176
Unique ID: 000399
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
Location(s): Washington, DC, 03 USA
Companies: Nalco Chemical
Date: 09/30/92

Nalco Chemical Company's Additives Group reportedly introduced its new Oxybrite (TM) dehazer at the National Conference on Clean Air Act Implementation and Reformulated Gasolines in Washington D.C. (9/30-10/2/92). The Oxybrite dehazers were developed specifically for reformulated fuels to

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provide rapid resolution of water-in-fuel emulsions. (News Release, 9/30/92, p. 1)

Index Number: 177
Unique ID: 000416
Main Category: ALTERNATIVE FUELS
Projects Type(s): reformulated gasoline
Location(s): , , Mexico
 , , USA
Companies: Petroleos Mexicanos
Date: 01/01/93

On December 10, 1992, Petroleos Mexicanos (Pemex), Mexico's state-owned oil monopoly, announced that it will significantly lower the levels of known pollution-generating compounds in both of its automotive gasolines. Pemex officials said in a statement that their new fuel formulas, made available in mid-December, would limit gasoline components that are precursors to ozone production. Company officials focused on how their gasolines would now meet standards set by the 1990 US Clean Air Act Amendments, which will require new gasoline formulas for the US oil companies starting in 1995. Pemex's new formulas, which will apply to both its unleaded "Magna Sin" and leaded "Nova Plus" gasolines, will match the 1995 US standards almost exactly, at least with respect to the content of benzene, olefins, and aromatics. Pemex said it would reduce the vapor pressure from 9.5 pounds per square inch (psi) to 8.5 psi, the same as in the US. (Environmental Watch Latin America 1/93, v. 3, No. 1)

Index Number: 178
Unique ID: 000029
Main Category: ALTERNATIVE FUELS
Projects Type(s): solar
Location(s): , , Japan
Companies: Nissan Motor Co. Ltd
Date: 05/25/92

Nissan Motor Co. Ltd. has built a single-seater solar car, the Sun Favor, to study the application of solar power in vehicle design. Power is provided by single-crystal silicon solar cells. The company intends to enter the car in three solar-car races and rallies later this year in Japan. (Automotive News, 5/25/92, p. 2)

Index Number: 179
Unique ID: 000145
Main Category: COAL\ACID RAIN

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Projects Type(s): catalytic technology
NOx controls
injection systems
Location(s): Barberton, OH, 05 U.S.A.
Companies: Babcock and Wilcox
Date: 04/23/92

Babcock and Wilcox, Barberton, OH, designs and sells Selective Catalytic Reduction (SCR) systems which are among the most widely accepted technologies for achieving NOx reductions in natural gas fired and coal fired boilers. In the SCR process, the flue gas leaves the boiler and passes through an injection grid. Ammonia is injected and mixed with the flue gas and when the ammonia and NOx pass over the surface of the catalyst, nitrogen and water are formed. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 180
Unique ID: 000351
Main Category: COAL\ACID RAIN
Projects Type(s): catalytic technology
NOx controls
Location(s): Salem, MA, 01 U.S.A.
Companies: New England Power Co.
Date: 12/14/92

New England Power Co. will install \$25 million selective catalytic reduction (SCR) technology at its Salem Harbor (MA) plant by the end of 1993. Installation of SCR is expected to reduce average annual NOx emissions at the plant by two-thirds from the current 12,000 tons/yr down to a targeted 4,000 tons/yr. The utility will install high-efficiency burners along with a system to spray emissions with ammonia or urea before they exit the stacks. (State Environment Report, 12/2/92, v. 12, No. 48 and Coal and Synfuels Technology, 12/14/93)

Index Number: 181
Unique ID: 000413
Main Category: COAL\ACID RAIN
Projects Type(s): catalytic technology
scrubbers
Location(s): , VA, 03 USA
Companies: Asea Brown Boveri (ABB)
General Electric
Southern Co.
Southern Electric International
Birchwood Power Partners

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Date: 01/18/93

The developer of a 220 MW coal-fired project in Virginia is Birchwood Power Partners, which is affiliated with Southern Electric International (SEI), a non-regulated arm of Southern Co. SEI so far has awarded contracts on the project to General Electric to supply the turbines and Asea Brown Boveri for the boiler equipment. The plant would be fired by pulverized coal and use selective catalytic reduction to control NOx and dry scrubbing to control SO2 emissions. Start of construction on the plant would be late this year or early in 1994, with operation in late 1996. The coal supply contract has not been awarded yet, and would be for a coal of less than one percent sulfur. (Energy Report 1/18/93, v. 21, No. 2)

Index Number: 182
Unique ID: 000128
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
Location(s): , KY, 04 U.S.A.
Companies: University of Kentucky
Date: 07/27/92

University of Kentucky researchers are hoping to cut in half the costs of pelletizing ultra-fine clean coal fines by borrowing an ingredient from beer makers. The research shows that a binder can be made from an inexpensive brewery waste, and, if successful, this process can cut the costs of pellets from \$6 or \$7 per ton to \$2 or \$3 per ton. (Coal and Synfuels Technology, 7/27/92, pp. 26-77)

Index Number: 183
Unique ID: 000131
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
Location(s): Pittsburgh, PA, 03 U.S.A.
Stoyville, PA, 03 U.S.A.
Companies: Custom Coals Corporation
Chase Manhattan
Date: 07/06/92

Custom Coals Corp. (Pittsburgh, PA) reached a \$500 million finance agreement with Chase Manhattan last week to build at least 10 plants by 2000 to produce clean-burning coals. The first large scale facility is a \$76 million plant in Stoyville, PA. The facility will manufacture two advanced products: Carefree and Self-Scrubbing Coals. Carefree fuel is formed by the removal of 90 percent of pyritic sulfur from non-compliance coals using a new technology that combines advanced coal cleaning and combustion techniques. Marble-sized,

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pelletized coal products are produced from which the pyritic, or free, sulfur has been removed at a coal preparation plant with a unique design. Some 70-80 percent of the remaining organic sulfur is captured with the use of additives during the combustion process. When a lower sulfur content is required, this coal is mixed with additives that produce Self-Scrubbing coal. (Energy Report, 7/06/92)

Index Number: 184
Unique ID: 000153
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
SO2 controls
injection systems
Location(s): Johnstown, PA, 03 U.S.A.
Companies: Bechtel Corporation
Pennsylvania Electric Co. Seward
Date: 03/30/92

Initial test results show that a clean coal method known as Confined Zone Dispersion (CZD) can be an effective, near-term option for use by utilities that must control emissions at older, coal-burning plants. Preliminary commercial-scale tests indicate that CZD can meet or exceed its goal of reducing SO2 emissions by 50 percent, indicating that older, space-confined power plants equipped with this pollution control technology could meet new SO2 emissions requirements in time. As a sorbent injection system, CZD was developed by Bechtel Corp. in the early 1980s as a low-cost, retrofit option with operating costs expected to be a third of costs for conventional scrubbers. Although some sorbent injection systems are incorporated inside the boilers, the CZD method operates inside existing ductwork between the boiler's air heater and particulate removal equipment. The atomizers form a cone-shaped confined zone of wet particles surrounded by hot combustion gases. As it moves through the duct, the cone cools and forms SO2-absorbing droplets that mix with hot gases outside the cone and dry quickly, preventing particles from building up on duct walls. Wastes are usually dry and easy to handle and do not require additional treatment for disposal. CZD and sorbent injection techniques in general are reputed to be especially well-suited for plants with a limited amount of space and/or older facilities that have too short an operating life to justify large capital investments needed for post-combustion systems. CZD is being demonstrated as a Round 3 clean coal technology at Pennsylvania Electric Co.'s 73-year-old Seward station outside Johnstown, PA. DOE is financing half of the \$9.2 million demonstration. If the 25-month demonstration continues error free, the system could be commercially available by 1994. (Coal & Synfuels Technology, 3/30/92)

Index Number: 185

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Unique ID: 000170
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
SO2 controls
gasification
Location(s): Springfield, IL, 05 U.S.A.
Decatur, IL, 05 U.S.A.
Companies: City Water, Light, and Power
State of Illinois
U.S. Department of Energy
Archer Daniels Midland
Date: 03/18/92

In anticipation of decreased demand for high-sulfur coal, combined private and public spending on research for clean coal technologies in Illinois is projected to pass the \$1 billion mark by 1995. The money will fund research on coal gasification projects, fluidized bed technology, and enhanced flue scrubber research. The State has promised about \$200 million for the research and DOE will reportedly match that total. Private and public cost-sharing funds will account for another \$717 million. There are two projects the state is banking on to illustrate the possibilities of clean coal technology. One is a coal gasification, combined cycle plant in Springfield, IL, to be built by City Water, Light & Power. According to DOE estimates, the technology could cut SO2 emissions by 99 percent and nitrogen oxides by 95 percent. The second is a fluidized bed combustion project at an Archer Daniels Midland plant in Decatur that now reportedly captures more than 90 percent of its SO2 emissions. (Energy Daily, 3/18/92, V. 20, No. 53)

Index Number: 186
Unique ID: 000183
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
Location(s): New Haven, WV, 03 U.S.A.
Companies: American Electric Power
U.S. Department of Energy
Date: 01/22/92

American Electric Power plans to build a new 340 MW commercial pressurized fluidized bed combustion (PFBC) technology plant adjacent to Appalachian's Mountaineer generating station in New Haven, W. VA. Construction of the new plant will begin in 1999 or up to three years earlier if growth in electricity demand accelerates in Appalachia's service area. DOE is cosponsoring the project by funding \$118 million. AEP plans to use a more efficient and modern "super-critical" steam cycle and will incorporate improvements from several smaller pilot and demonstration facilities. (Energy Daily, 1/22/92)

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Index Number: 187
Unique ID: 000190
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
natural gas
Location(s): , , U.S.A.
Companies: Sierra Pacific Power Co.
U.S. Department of Energy
Date: 09/13/91

The Department of Energy approved funding for Sierra Pacific Power CO.'s proposal to construct the Pinon Pine Power Project. Sierra's proposal to DOE is to construct and operate a "state-of-the-art," 80-megawatt power plant capable of using coal, gas, natural gas or diesel oil to generate electricity, allowing it to use the fuel that is most economically priced. The Pinon Pine Power Project, which is one of nine demonstration projects in the country selected to receive matching funds to demonstrate advanced "Clean Coal Technology", is expected to cost \$160mm to build with half of the funds coming from DOE. (Energy Alert, 9/13/91)

Index Number: 188
Unique ID: 000191
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
SO2 controls
limestone injection
ESPs
Location(s): Richmond, IN, 05 U.S.A.
Williamsport, PA, 03 U.S.A.
Pittsburgh, PA, 03 U.S.A.
Companies: LIFAC North America
ICF Kaiser Engineers
Tampella Power
Richmond Power and Light
U.S. Department of Energy
Date: 05/07/91

LIFAC North America has been jointly formed by ICF Kaiser Engineers and Tampella Power to demonstrate and market Tampella's 'clean coal' technology. ICF Kaiser Engineers' Pittsburgh office will jointly build a \$17 million pilot project with Tampella (Williamsport, PA) at Richmond Power & Light's Whitewater Valley 60 MW Unit 2 (Richmond, IN). The project began operation in July 1992. Half the cost of the project is being picked up by DOE, which chose LIFAC North America as one of 35 clean coal technologies. The "limestone into the furnace and activation of unreacted calcium" (LIFAC)

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process uses a bed of pulverized limestone and humidification to remove between 70-80 percent of sulfur dioxide emissions produced by burning high-sulfur coal. It is considered to be simpler and about half as expensive as wet scrubber systems. The LIFAC system takes standard furnace sorbent injection a step further by adding post-furnace spray humidification to enhance removal of sulphur dioxide from coal-fired boilers. Water droplets sprayed over the gas stream emerging from the furnace dissolve entrained lime particles and SO₂ and shrink its volume. This improves the efficiency of the electrostatic precipitator, which traps the fly ash by-product. (Eco-Log Week, 8/7/92, V. 20, No. 30, p. 1, Canadian Mining Journal, 10/92, p. 31, Environment Week, 7/23/92, and Pittsburgh Press (PA), 5/7/91, p. B3)

Index Number: 189
Unique ID: 000298
Main Category: COAL\ACID RAIN
Projects Type(s): clean coal tech-other
Location(s): Golden, CO, 08 U.S.A.
Companies: AMAX Coal
Date: 10/09/92

Amax Coal Industries and Amax Research and Development Center began work on projects that will demonstrate the commercialization potential of "column flotation" and "selective agglomeration" to produce super clean coal that can be substituted for premium fuel oil in utility and large industrial applications. Scientists plan to design and build a 2-3 ton/hr process development unit at the AmaxUS pilot plant in Golden, CO. The project will entail laboratory research and bench-scale testing of processes for six coals. (Coal and Synfuels Technology, October 9, 1992, V. 13, No. 40)

Index Number: 190
Unique ID: 000142
Main Category: COAL\ACID RAIN
Projects Type(s): emissions credits/trade
Location(s): , TN, 04 U.S.A.
 , WI, 05 U.S.A.
Companies: Tennessee Valley Authority
 Wisconsin Power and Light Company
 Clean Air Capital Markets
Date: 05/12/92

The Tennessee Valley Authority will meet part of its clean air requirements by buying pollution "credits" worth 10,000 tons/yr of emissions from Wisconsin Power & Light Co. The TVA is expected to spend \$250 to \$400 a ton for a total of \$2.5 million to \$4 million for the credits. The Tennessee-based utility is the largest in the United States and is planning to carry out its own

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pollution prevention projects. But if there is a delay in installing cleanup equipment or other problems hindering its own efforts, the TVA could use the credits instead to comply on time. A Washington investment firm by the name of Clean Air Capital Markets set up the deal. (The Washington Post, 5/12/92, p. C1, C4)

Index Number: 191
Unique ID: 000168
Main Category: COAL\ACID RAIN
Projects Type(s): emissions credits/trade
Location(s): Chicago, IL, 05 U.S.A.
Sacramento, CA, 09 U.S.A.
Companies: Resource Management International
Sargent & Lundy
Keystone-Conemaugh Projects Office
Date: 03/23/92

Backers of a plan to pool "early scrub" bonus emissions credits named the consulting firm of Resource Management International as the pool's administrator. The Chicago-based firm of Sargent & Lundy will subcontract through RMI for architectural and engineering services. RMI is based out of Sacramento, CA and will be responsible for reviewing EPA credit applications by members, obtaining credits from winning members of the pool and redistributing them, and monitoring whether members are actually building scrubbers as laid out in their EPA applications. On March 31, officials of entities (utilities, municipalities, and the Keystone-Conemaugh Projects Office, a joint venture of several utilities) interested in the pool met to receive the final contract. All parties were expected to sign by April 30. (Coal & Synfuels Technology, 3/23/92, V. 13, No. 12)

Index Number: 192
Unique ID: 000174
Main Category: COAL\ACID RAIN
Projects Type(s): emissions credits/trade
Location(s): New York City, NY, 02 U.S.A.
Chicago, IL, 05 U.S.A.
New York City, NY, 02 U.S.A.
Companies: New York Mercantile Exchange
Chicago Board of Trade
Cantor Fitzgerald Brokerage Corporation
Date: 03/02/92

The New York Mercantile Exchange recently submitted a proposal to EPA to administer the direct sale and auction of SO2 emissions allowances. Other possible business developments that could arise out of the emissions allowance

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market include a futures market for low-sulfur coal and trading allowances futures. The Chicago Board of Trade also submitted an application to EPA to run the Agency's auctions and direct sales of allowances. Last July, the Board publicly announced its intention to create a futures market for allowances and to offer market participants an electronic bulletin board system that will distribute information on available allowances. A third party, Cantor Fitzgerald Brokerage Corp. of New York City, is also vying to administer the SO2 allowances program. In December 1991, EPA solicited proposals from organizations on delegating SO2 allowances. EPA's decision on a managing agent for auctions and direct sales has not yet been made. (Coal & Synfuels Technology, 3/02/92, V. 13, No. 9)

Index Number: 193
Unique ID: 000359
Main Category: COAL\ACID RAIN
Projects Type(s): emissions monitoring
Location(s): San Diego, CA, 09 U.S.A.
Evansville, IN, 05 U.S.A.
Companies: GAMMA-METRICS
PSI Energy Gibson
Date: 11/01/92

GAMMA-METRICS of San Diego, CA, was reported to have sold a coal quality management system to PSI Energy to be installed at the Gibson Station northwest of Evansville, IN. The system includes a network of five on-line coal analyzers and five computerized operator consoles that will enable plant operators to track coal quality and sulfur dioxide emissions on Units 1 through 4. The analyzers provide minute-by-minute elemental analysis of the coal enabling SO2 emissions to be calculated. Additional information is also provided on moisture, ash constituents, and elements such as carbon, nitrogen, chlorine, and hydrogen. (AirTECH News, 11/92, p. 163)

Index Number: 194
Unique ID: 000360
Main Category: COAL\ACID RAIN
Projects Type(s): emissions monitoring
Location(s): Irvine, CA, 09 U.S.A.
Chicago, IL, 05 U.S.A.
Companies: Fluor Daniel Inc.
Commonwealth Edison
Date: 11/01/92

Fluor Daniel, Irvine, CA, reports the receipt of a contract from Commonwealth Edison Co. of Chicago, IL, to install emission monitoring systems in 19 smokestacks at 10 coal-burning stations in northern Illinois. Installation is

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expected to be completed by mid-1994. In addition to installing the systems, Fluor will prepare an operating procedures manual and supervise testing and certification. (AirTECH News, 11/92, p. 163)

Index Number: 195
Unique ID: 000297
Main Category: COAL\ACID RAIN
Projects Type(s): ESPs
low/medium sulfur coal
particulates
Location(s): , , U.S.A.
Companies: Electric Power Research Institute (EPRI)
Date: 10/27/92

The Electric Power Research Institute has patented a new technology called EPRICON that will help maintain the performance of electrostatic precipitators (ESPs) when utilities shift to lower sulfur coal. When coal sulfur is reduced from 3% to less than 1%, particulate emissions from an ESP reportedly can be increased tenfold. An ESP depends on fly ash resistivity which is controlled by sulfuric acid vapor in flue streams. The vapor forms from SO₃, a byproduct of fuel combustion, but the amount of SO₃ is reduced with lower-sulfur fuel and thereby degrades an ESP's efficiency. EPRICON is reagentless and withdraws 1-3% of hot flue gas from boilers, passes it through a catalyst and converts some of the SO₂ into SO₃ which is then injected back into the flue duct so that no sulfur is released into the air. (Clean Air Network Online Today, October 27, 1992)

Index Number: 196
Unique ID: 000350
Main Category: COAL\ACID RAIN
Projects Type(s): ESPs
Location(s): Hammond, GA, 04 U.S.A.
Companies: Research-Cottrell
Air and Water Technologies Corp.
Georgia Power
Date: 01/12/92

Research-Cottrell, a subsidiary of Air & Water Technologies Corporation, has been awarded two contracts by Georgia Power to refurbish an electrostatic precipitator (ESP) on Georgia Power's Hammond plant Unit 3 and to provide materials for a new ESP on Unit 4. The contracts are valued in excess of \$7 million. Research-Cottrell will provide design, engineering, partial demolition, materials, delivery, and erection services for the 100 megawatt Unit 3 project with start-up expected in late May 1993. The second contract is for materials delivery in the construction of a new ESP at Hammond's Unit

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4. Materials delivery is expected in August 1993. (Clean Air Network Online Today, 1/12/93)

Index Number: 197
Unique ID: 000137
Main Category: COAL\ACID RAIN
Projects Type(s): filters/traps.
particulates
Location(s): , ND, 08 U.S.A.
Companies: University of North Dakota
Date: 06/01/92

The University of North Dakota is reaching a 99.99 percent particulate removal using fabric filters with flue gas conditioning. The focus is on fine particulate (less than 10 microns) which is expected to eliminate a good portion of air toxics as well. (Energy Report, 6/1/92)

Index Number: 198
Unique ID: 000181
Main Category: COAL\ACID RAIN
Projects Type(s): filters/traps
low/medium sulfur coal
Location(s): , , U.S.A.
Companies: Research-Cottrell
Date: 02/05/92

Research-Cottrell, has purchased the exclusive right to market Howden fabric filter technology products in North America. Research-Cottrell will license the Howden shaker and pulse-jet fabric filter technologies and market them to power generation and industrial clients. The pulse-jet system is a low-pressure, high-volume system that, because of its compact size, can be used to replace or convert an existing electrostatic precipitator. This enables the system to handle the high resistivity and increased ash loading characteristics of low sulfur coal, a significant feature in light of the Clean Air Act Amendments. (PR Newswire, 2/5/92, p. 1)

Index Number: 199
Unique ID: 000189
Main Category: COAL\ACID RAIN
Projects Type(s): gasification
Location(s): Houston, TX, 06 U.S.A.
West Terre Haute, IN, 05 U.S.A.
Companies: Destec Energy
U.S. Department of Energy

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PSI Energy, Wabash River
Date: 11/13/91

Destec Energy (Houston), which went public last March but is 73 percent owned by Dow, won DOE financial backing in September's Clean Coal program awards. With 240 million in DOE dollars, Destec is planning a 265 megawatt coal gasification unit at PSI Energy's Wabash River Generating Station in West Terre Haute, IN. (Chemical Week, 11/13/91)

Index Number: 200
Unique ID: 000339
Main Category: COAL\ACID RAIN
Projects Type(s): gasification
Location(s): , , Canada
Companies: Bechtel Canada
General Electric Company
Coal Association of Canada
Date: 10/01/92

Bechtel Canada has performed a cost analysis of a conceptual IGCC plant that integrates General Electric's 7F with a Shell gasifier and a conventional air separation unit for the Coal Association of Canada. (Canadian Mining Journal, 10/92, p. 31)

Index Number: 201
Unique ID: 000340
Main Category: COAL\ACID RAIN
Projects Type(s): gasification
Location(s): Reno, NV, 09 U.S.A.
Houston, TX, 06 U.S.A.
Companies: M.W. Kellogg
Sierra Pacific Power Co.
Date: 11/09/92

M.W. Kellogg Co., Houston, will provide its KRW advanced coal gasification technology for a Sierra Pacific Power Co. plant near Reno, Nevada. This will reportedly be the first commercial application of the clean coal technology, which features air-blown gasification and hot-gas clean-up for pollutant-control. (Business and Technology Air Water Pollution Report, 11/9/92, V. 3, o. 44)

Index Number: 202
Unique ID: 000349
Main Category: COAL\ACID RAIN

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Projects Type(s): gasification
clean coal tech-other
biological technology
Location(s): Carbondale, IL, 05 U.S.A.
Carterville, IL, 05 U.S.A.
Companies: Southern Illinois University
Date: 01/12/93

Southern Illinois University at Carbondale is reported to be researching coal characterization and material separation in an effort to identify clean ways of processing coal cost-effectively. Researchers at the institution have identified bacteria that can digest organic sulfur and are hoping to enhance the bacteria's digestive efficacy through genetic engineering. Other research has focused on developing technologies to use coal more efficiently and burn it more cleanly. Towards this end, researchers at SIUC have reportedly improved fluidized bed combustors and have introduced new gasification and liquefaction techniques to produce cleaner-burning gas and liquid fuels made from coal. The research team at SIUC is planning to build an experimental "mild gasification" plant in the Illinois Coal Development Park near Carterville which will refine coal into clean solid fuel, liquid by-products for use as fuel or as chemicals, and the gas that will power the plant. (Clean Air Network Online Today, 1/12/93)

Index Number: 203
Unique ID: 000132
Main Category: COAL\ACID RAIN
Projects Type(s): limestone injection
scrubbers
SO2 controls
Location(s): Yorktown, VA, 03 U.S.A.
Companies: Virginia Power Yorktown
Date: 07/02/92

Virginia Power's Yorktown Power Station began a one-year test of a low-cost technology to reduce sulfur emissions from coal-fired generating stations. The technology, known as Limestone Injection Multistage Burner, or LIMB, could help as many as 200 coal-fired plants reduce SO2 emissions by up to 50 percent. Lime is injected into the exhaust of the coal plant and reacts with sulfur dioxide to produce calcium sulfate, a dry waste that can be safely disposed of in landfills. This process is less costly than conventional wet scrubbers, but scrubbers are reported to be up to 90 percent more effective. (Energy Daily, 7/2/92)

Index Number: 204
Unique ID: 000141

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Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
SO2 controls
gasification
Location(s): , FL, 04 U.S.A.
Schenectady, NY, 02 U.S.A.
Companies: Tampa Electric
Texaco
General Electric Company
U.S. Department of Energy
Date: 05/13/92

Tampa Electric completed arrangements with Texaco and GE to supply two major components of its planned 260-megawatt power plant that is a part of DOE's Clean Coal III Project. The innovative facility has a combustion turbine that is expected to come on line in July 1995, and a gasification/clean-up and combined cycle configuration in July 1996. The project will demonstrate a metal oxide hot gas clean-up system that removes sulfur at temperatures of about 1,000 degrees Fahrenheit and improves plant cycle efficiency by 10-12 percent. During a two-year demonstration, Tampa Electric will assess and report on its technical and financial feasibility based on the use of a fuel mix of various eastern coals. The plant will use the first commercial applications of these advanced integrated technologies in the U.S. relating to two parts of the IGCC project: 1) an oxygen-blown entrained-flow gasification system that will process about 1,900 tons of coal per day into a low Btu coal gas provided by Texaco Inc.'s Alternate Energy Group, N.Y; and 2) an advanced combustion turbine capable of operating with a low Btu coal gas fuel provided by GE, Schenectady, NY. The project will add the use of low Btu coal gas in the combustion turbine. (Clean Air Network Online Today, 5/13/92)

Index Number: 205
Unique ID: 000148
Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
natural gas
NOx controls
SO2 controls
Location(s): Chalk Point, MD, 03 U.S.A.
Morgantown, MD, 03 U.S.A.
Dickerson, MD, 03 U.S.A.
Companies: Potomac Electric Power Co.
Date: 04/06/92

Potomac Electric Power (PEPCO) expects to switch to lower sulfur fuels at its Chalk Point and Morgantown power plants. PEPCO tentatively plans to add natural gas capability to Chalk Point's two 341-MW coal units by Jan. 1, 1995.

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PEPCO then will be able to co-fire coal and gas or switch back and forth as market conditions dictate. Chalk Point's other two units already burn either oil or natural gas. At Morgantown, PEPCO's largest coal consumer, two 582-MW units can burn either coal or oil. PEPCO substitutes oil for coal in these units whenever the price is right and can also switch to lower-sulfur oil, depending on the price, to reduce SO2 emissions. PEPCO's compliance plan includes the possibility of emissions trading allowances and installing low-NOx burners on the Chalk Point and Morgantown coal units for Phase 1 and on the Dickerson and Potomac River coal units for Phase 2. (Coal Outlook, 4/06/92, V. 16 No. 14)

Index Number: 206
Unique ID: 000164
Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
scrubbers
emissions credits/trade
Location(s): , FL, 04 U.S.A.
Companies: Tampa Electric Big Bend
Date: 03/30/92

Tampa Electric will switch Unit 3 at its Big Bend plant to a low-sulfur blend of coal from Jan. 1, 1995, to Jan. 1, 1997. The utility will decide around July 1 whether to build a scrubber on Unit 3 to be in service by Jan. 1, 1997. That decision will depend on the number of bonus credits received and on whether scrubber vendors or coal suppliers bid the lowest prices. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 207
Unique ID: 000169
Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
Location(s): , IL, 05 U.S.A.
Companies: Central Illinois Public Service, Hutsonville
Central Illinois Public Service, Grand Tower
Central Illinois Public Service, Coffeen
AMAX Coal
Exxon Coal
Date: 03/23/92

Central Illinois Public Service (CIPS) is talking with AMAX Coal about supplying some of the coal needs at its Hutsonville plant beginning in 1993. The plant is now fired by high-sulfur coal supplied by Black Beauty Coal under a contract that expires at the end of this year. The plant is not on the Phase I list, but CIPS's Grand Tower plant is. CIPS will continue burning

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high-sulfur coal at Grand Tower and thus must offset those emissions elsewhere in the system. Some of those offsets will be accomplished at Coffeen, where Exxon Coal is supplying a lower sulfur coal as the result of a contract signed in early 1991. (Coal Outlook, 3/23/92, V. 16, No. 12)

Index Number: 208
Unique ID: 000172
Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
Location(s): , AL, 04 U.S.A.
Companies: Southern Co. Services
Alabama Power, Gaston
Alabama Power, Gorgas
Alabama Power, Miller
Jim Walter Resources
Date: 03/16/92

Southern Co. Services is preparing a Request for Proposals to obtain term coal for Alabama Power. Alabama Power intends to examine its needs for low-sulfur coal for its Gaston plant and for somewhat higher sulfur coal for the Gorgas and Greene County plants. For the Miller plant, the RFP may specify a beginning date of 1993 to conform with a market review in a term coal contract with Jim Walter Resources. Miller burns coals containing no more than 1.2 lbs/mmBtu of SO₂. A quarterly spot bid invitation is anticipated for coals moving to Gaston and other plants beginning July 1. A short list of coal bidders could be developed by May. (Coal Outlook, 3/16/92, V. 16, No. 11)

Index Number: 209
Unique ID: 000179
Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
Location(s): Richmond, VA, 03 U.S.A.
Companies: A.T. Massey Coal
Toledo Edison Bay Shore
Date: 02/24/92

A.T. Massey Coal (Richmond, VA) has bought two idled coal mines (Big Creek 1 and 2), a prep plant, and 130 million tons of recoverable coal reserves from Island Creek. Massey aims to begin production in early to mid-1993 with a target of 1 million tons of production in 1993. The target market for this operation will be the low-sulfur utility market fostered by the 1990 Clean Air Act. Part of the sales agreement is to supply Toledo Edison's Bay Shore plant. (Coal Outlook, 2/24/92)

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Index Number: 210
Unique ID: 000182
Main Category: COAL\ACID RAIN
Projects Type(s): low/medium sulfur coal
Location(s): New Madrid, MO, 05 U.S.A.
Companies: Associated Electric Cooperative Inc.
Rochelle Coal Company
Date: 02/03/92

To meet the Clean Air Act SO2 requirements, Associated Electric Cooperative (AEC) Inc. plans to switch to a low sulfur fuel at its Missouri coal-fired power plant in mid-1994. Rochelle Coal Co. recently signed a long-term supply agreement with AEC to supply about 4 million tons/yr of 0.2 percent sulfur Powder River Basin coal to the company's New Madrid plant in Missouri. AEC had previously considered installing a scrubber but decided to change coal types instead. (Coal & Synfuels Technology, 2/3/92)

Index Number: 211
Unique ID: 000106
Main Category: COAL\ACID RAIN
Projects Type(s): modeling (computer)
Location(s): Menlo Park, CA, 09 U.S.A.
Companies: Electric Power Research Institute (EPRI)
Date: 03/01/92

The Electric Power Research Institute (EPRI), Menlo Park, CA, has developed an air toxics risk assessment methodology called RiskPISCES designed to help utilities meet recent state and local air-quality requirements for multi-media risk assessments. The methodology will address priority air toxics identified in fossil power plant flue gas through EPRI's Power Plant Integrated Systems Chemical Emissions Study (PISCES). The model uses sensitivity analyses to evaluate which exposure pathways are of greatest concern for each substance and each setting. Risks that merit greater concern can then be explored in further detail. EPRI is also updating two computer models, Air Emissions Risk Assessment Model (AERAM) and AirTox. AERAM uses individual power plant data to perform risk assessments for discrete operating scenarios. AirTox applies to a variety of options and can manipulate parameters to determine the health risk effects of changes in fuel, stack height, or other key operating features. (Air Toxics Report, 3/92)

Index Number: 212
Unique ID: 000139
Main Category: COAL\ACID RAIN
Projects Type(s): modeling (computer)
Location(s): , IL, 05 U.S.A.

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Companies: , WY, 08 U.S.A.
Sandia National Laboratory Combustion Research
Facility
Central Illinois Public Service
Date: 05/18/92

ADLVIC, a computer model developed by Sandia National Laboratory's Combustion Research Facility, could make the choice between Eastern and Western coals easier by helping utilities decide which coal is economically feasible for certain boilers. The model is reported to give coal operators more information on coal ash deposits than competing models and could lead to the design and operation of more efficient, cleaner burning power plants. With ADLVIC, operators and designers get a clearer picture of combustion characteristics of a particular coal and make adjustments for those characteristics. ADLVIC's first commercial-scale test took place on a 600-MW Central Illinois Public Service boiler that consumed about 72,000 tons of Wyoming coal during a three week test burn. Through ash deposition analysis, the model's ability to predict ash deposit accumulation rate, removability, emissivity, and chemical composition were confirmed. (Coal and Synfuels Technology, 5/18/92)

Index Number: 213
Unique ID: 000140
Main Category: COAL\ACID RAIN
Projects Type(s): modeling (computer)
emissions credits/trade
Location(s): Fairfax, VA, 03 U.S.A.
Companies: ICF Resources
Date: 05/18/92

ICF Resources, Fairfax, VA, developed an analysis that can determine updated SO2 allowance values to help industry managers understand the risks and opportunities associated with the SO2 emissions allowance market. To forecast market impacts and allowance prices for acid rain proposals, ICF uses a detailed linear programming model called the Coal and Electric Utilities Model (CEUM). The report presents estimated allowance prices, explains the effects of key risks and uncertainties on allowance prices, and discusses the interrelationship of prices, utility plans, and costs. (Coal and Synfuels Technology, 5/18/92)

Index Number: 214
Unique ID: 000358
Main Category: COAL\ACID RAIN
Projects Type(s): modeling (computer)
clean coal tech-other

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Location(s): Homer City, PA, 03 U.S.A.
Companies: CQ Inc.
Date: 11/01/92

CQ Inc., of Homer City PA, is developing a PC-based computer program for evaluating potential coal cleaning, blending, and switching options. The Coal Quality Expert software will consist of more than 20 sub-models designed to predict the impact of coal quality upon power plant operations, maintenance, economics, and emissions. A number of companies are involved in the project which requires extensive testing to determine the optimum coal quality needed for combustion in different types of equipment. The goal is to allow utilities to identify the lowest cost, clean coals based on their specific requirements. The software will also provide detailed modeling and analytical support for evaluating options for a specific plant. The software is scheduled for completion in August 1994. (AirTECH News, 11/92, p. 156)

Index Number: 215
Unique ID: 000134
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
catalysts
catalytic technology
Location(s): Durham, NC, 04 U.S.A.
Companies: Cormatech
Corning Inc.
Mitsubishi
Date: 06/15/92

Corning and Mitsubishi formed Cormatech, a Durham, NC, ceramics-based NOx control firm that recently dedicated a 60,000 square-foot headquarters and plant. The firm also has started making the first ceramic-based catalysts in America for a market encompassing power generation, chemical manufacturing, and other industrial sectors. Cormatech uses selective catalytic reduction (SCR) technology in which ammonia is injected into the flue gas as the mixture passes through the catalyst. The mixture then becomes nitrogen and water. (Air Quality Week, 6/15/92)

Index Number: 216
Unique ID: 000151
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
injection systems
Location(s): Niles, OH, 05 U.S.A.
Companies: EPA Air and Energy Engineering Research Laboratory
(AEERL)

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Date: 04/01/92

EPA's AEERL is co-sponsoring a reburn demonstration for NOx control on a 108 MW cyclone coal-fired plant in Niles, OH. In initial testing with the original fuel injectors (using flue gas recirculation), AEERL achieved a 60 percent NOx reduction from a NOx baseline level of 702 ppm. The original reburn fuel injectors were replaced with new water-cooled fuel injectors to eliminate the use of flue gas recirculation which was causing slag buildup on the rear wall of the boiler. With the modified fuel injectors, the NOx was reduced to 350 ppm for a 51 percent NOx reduction. To achieve improved NOx reduction, water or steam will be introduced into the natural gas stream to replace the temperature and reaction time and allow for better mixing. In late January, two of the five injectors developed water leaks and the NOx level dropped to 220 ppm for a 69 percent NOx reduction. Long-term tests that are about 60 days long will be performed without water injection from March to May. If all sponsors and the host site agree, a second series of tests with water injection will be run from May through July 1992. Controlled amounts of water will be introduced into the natural gas stream with the aim of improving the process. (ORD Engineering Highlights, 4/92, p. 2)

Index Number: 217
Unique ID: 000152
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
particulates
Location(s): , , China
Companies: EPA Air and Energy Engineering Research Laboratory
(AEERL)
Date: 04/01/92

As part of the continuing People's Republic of China-U.S. etiologic study of the relationship between lung cancer and indoor open hearth combustion of coal, an EPA AEERL test facility was used to burn coal associated with extremely high lung cancer rates. The coal was burned both in chunk form and in briquettes composed of the same coal ground and combined with clay. The briquette firing showed reductions of total particulate by 70 percent, medium boiling organics by 90 percent, benzo(a)pyrene by 65 percent, and heavy organics by 70 percent compared to the chunk form. NO2 was reduced by 50 percent to 100 ppb. More extensive testing will be needed to identify the processes involved and to quantify the results, however the data are an indication of the briquettes' potential in markedly reducing the exposure faced by some rural Chinese. (ORD Engineering Highlights, 4/92, p. 2)

Index Number: 218
Unique ID: 000154

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Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
Location(s): Milwaukee, WI, 05 U.S.A.
Companies: Wisconsin Electric Power, Valley Plant
Date: 03/30/92

Wisconsin Electric Power completed the first phase of the urea-based NOx OUT selective noncatalytic reduction (SNCR) test at Wepco's Valley Power Plant in Milwaukee. The preliminary test showed up to 75 percent NOx attenuation, high reagent use, and no measurable escape of gas phase ammonia. The test was set up in two days using existing upper furnace view ports and trailermounted feed equipment and reagent storage. NOx was reduced from 50 percent to 75 percent by adjusting the feed rate of the reagent. (Clean Air Weekly, 3/30/92, p. 1)

Index Number: 219
Unique ID: 000167
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
SO2 controls
Location(s): , ,
Companies: NOXSO Corporation
W.R. Grace & Company
Date: 03/26/92

NOXSO Corporation has pioneered the NOXSO process for reducing nitrogen oxide and sulfur oxides from coal fired power plants. The sorbent, produced by Grace, removes more than 80 percent of the nitrogen oxide and sulfur oxide while producing a marketable by-product, elemental sulfur. Currently the NOXSO process is in a 5-megawatt demonstration and will be a full scale commercial demonstration on a 115-megawatt unit in 1993. (PR Newswire, 3/26/92)

Index Number: 220
Unique ID: 000173
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
Location(s): Naperville, IL, 05 U.S.A.
, , Netherlands Antilles
Companies: Nalco Fuel Tech
Fuel Tech
Nalco Chemical
Date: 03/12/92

Nalco Fuel Tech offers a process by which a chemical called urea is sprayed inside of operating boilers to break down nitrogen oxide, a major pollutant.

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The process breaks the nitrogen oxide down into harmless compounds, such as water and carbon dioxide. Nalco Fuel Tech (Naperville, IL) is a 2-year old joint venture of Fuel Tech (Netherlands Antilles), a British-owned firm, and Nalco Chemical, formed to help other companies control pollution. The pollution-control process that Nalco Fuel Tech uses was acquired by Fuel Tech in the early 1980s while Nalco Chemical is known for a process it developed to clean sludge out of the boilers of railroad locomotives. Nalco Fuel Tech was formed in 1990 to take advantage of what its creators saw as the huge potential market that would be created as a result of the Clean Air Act of 1990. (Chicago Tribune (IL), 3/12/92, p.3; 1,4)

Index Number: 221
Unique ID: 000296
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
SO2 controls
Location(s): Windsor, CT, 01 U.S.A.
Alliance, OH, 05 U.S.A.
Worcester, MA, 01 U.S.A.
Companies: ABB Combustion Engineering
Babcock and Wilcox
Riley Stoker
Date: 10/01/92

DOE has chosen ABB Combustion Engineering of Windsor, CT; Babcock & Wilcox of Alliance, OH; and Riley Stoker of Worcester, MA to begin developing low emission boilers. The goal of the project is to develop designs that will incorporate pollution control into the original design instead of using add-on equipment. Eventually, one of the teams will be chosen to build a "proof of concept" unit that could represent the next step in coal-fired boiler designs. Emissions targets for the low emission boiler system are 0.2 pounds of SO2, 0.2 pounds of NOx, and 0.015 pounds of particulate matter per million Btu of fuel input. The boilers have increased thermal efficiency and are reported to achieve electricity production costs comparable to those of new conventional pulverized coal plants. (Waste Treatment Technology News, October 1992, V. 7, No. 12)

Index Number: 222
Unique ID: 000341
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
scrubbers
Location(s): , , U.S.A.
Companies: Georgia Power Company Yates
Date: 10/26/92

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Georgia Power reportedly will begin testing low-NOx burners at its Yates power plant. The facility is also installing flue gas conditioners on all seven of its units. A scrubber demonstrating the Chiyoda Thoroughbred-121 process, a DOE clean coal project, will be installed on Unit 1. (Coal & Synfuels Technology, 10/26/92, V. 13, No. 42)

Index Number: 223
Unique ID: 000361
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
catalytic technology
Location(s): Clinton, NJ, 03 U.S.A.
, FL, 04 U.S.A.
Companies: Foster Wheeler
Bechtel Corporation
Date: 11/01/92

Foster Wheeler Energy Corporation (FWEC) of Clinton, NJ, reportedly received a \$50 million order from Bechtel Power Corporation for a 330-MW (net) pulverized coal-fired steam generator to be installed as part of a cogeneration project in Florida. The unit includes low-NOx burners combined with a FWEC selective catalytic reduction system. (AirTECH News, 11/92, p. 163)

Index Number: 224
Unique ID: 000363
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
Location(s): Waltham, MA, 01 U.S.A.
Companies: Tecogen
Date: 10/01/92

Tecogen, Inc. of Waltham, MA, is studying the use of a soft corona discharge to reduce levels of nitrogen oxides in flue gas. The electrons generated by the corona discharge promote dissociation of the NOx molecules with reduction rates reportedly approaching 99 percent. The corona discharge process, TECOLYTIC DeNOx involves the generation of a low-energy gaseous plasma, or corona, within a chemical reactor. Experiments were conducted with NO in nitrogen, NO in nitrogen and oxygen, and gas combustion flue gas with reported greater than 99 percent NOx reduction efficiencies demonstrated for all three gases. The company is exploring scale-up for large installations and the cost/benefit obtained for various design choices. (AirTECH News, 10/92, p. 136)

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Index Number: 225
Unique ID: 000403
Main Category: COAL\ACID RAIN
Projects Type(s): NOx controls
Location(s): , CA, 09 USA
Akron, OH, 05 USA
Companies: Southern California Gas Co.
Norton Chemical Process Products Corporation
Date: 02/01/93

Southern California Gas Co. (SoCalGas) contracted Norton Chemical Process Products Corp., of Akron, OH, to provide four NOx emission removal systems for its \$30 million Wheller Ridge compressor station. SoCalGas started construction on the station in January 1993, and will reportedly be fully online by the end of 1993. The system will reportedly deliver 95% NOx removal in a one-step process and is the first gas turbine selective catalyst reduction application to eliminate water injection in the gas turbine to control NOx emissions. (Oil and Gas Journal, 2/1/93, p. 25)

Index Number: 226
Unique ID: 000186
Main Category: COAL\ACID RAIN
Projects Type(s): recycling
Location(s): Milwaukee, WI, 05 U.S.A.
Companies: Wisconsin Electric, Pleasant Prairie Plant
Date: 01/08/92

Wisconsin Electric completed a fly ash demonstration project that may enable the Milwaukee-based utility by 2000 to reuse or market all of the roughly 500,000 tons of ash it generates annually. The utility already markets approximately 50 percent, or 250,000 tons, of its fly ash each year as a substitute for Portland cement. Wisconsin Electric recently paved a half-mile-long section of road on the grounds of its Pleasant Prairie Power Plant using a mixture of 50-60 percent carbon fly ash as a cement substitute. Wisconsin Electric has also found that portions of its bottom ash generated at power plants can be useful for farmers in areas with compacted soils. (Energy Daily, 1/8/92)

Index Number: 227
Unique ID: 000127
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
gasification
clean coal tech-other
Location(s): Carbondale, IL, 05 U.S.A.

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Companies: Southern Illinois University
Date: 08/03/92

Researchers at Southern Illinois University at Carbondale are working on 16 projects to combat the potential of coal wastes from clean coal technologies, including advanced scrubbers and coal gasification. One project explores the potential of using FBC residues as binder or filler aggregates for construction applications. Another project is a six-year endeavor to develop cost-effective and environmentally safe methods of handling, disposing, and utilizing the coal combustion residue. The Illinois Department of Energy and Natural Resources has committed more than \$133 million to the research and development of these technologies. (Coal and Synfuels Technology, 8/3/92)

Index Number: 228
Unique ID: 000130
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
low/medium sulfur coal
Location(s): , , U.S.A.
Companies: Industrial Information Systems
Date: 07/08/92

Industrial Information Systems stated in a report that scrubber capacity will increase significantly by 2000. Overall, 26 new scrubbers, on 15,479-MW of generating capacity, will be installed by 1995. An additional 34 scrubbers, on 13,778-MW of capacity, are expected to be built by 2000. These additions will boost scrubber capacity by 43 percent by 2000. In addition, the report stated that the big winners from Phase I regulations are likely to be the Central Appalachian, Northern Great Plains, and Rocky Mountains/Southwest coal-producing regions, where there are large quantities of low-sulfur coal. (Energy Daily, 7/8/92)

Index Number: 229
Unique ID: 000133
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
recycling
Location(s): Warren, NJ, 02 U.S.A.
Dunkirk, NY, 02 U.S.A.
Companies: Aquatech Systems
U.S. Department of Energy
Allied Signal
Date: 07/01/92

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Aquatech Systems (Warren, NJ) has reportedly developed a way to scrub stack gases from coal-burning units without creating sludge which must be landfilled. The method, known as Soxal, involves diverting the gas stream through a scrubber where sulfur pollutants are stripped by a sprayed slurry of sodium sulfite. The sulfur-containing slurry enters the Aquatech stack cell where sodium sulfite is separated out, to be recycled, and an acidic sodium sulfate solution containing sodium dioxide gas is sent on to a steam stripper, where marketable sulfur dioxide and sodium sulfate solutions are recovered. The demonstration plant is in Dunkirk, NY, with the support of DOE, utilities in New York State, and Allied-Signal, parent of Aquatech. (Mechanical Engineering, 7/92)

Index Number: 230
Unique ID: 000136
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
NOx controls
dryers
Location(s): Pittsburgh, PA, 03 U.S.A.
Companies: Department of Energy Pittsburgh Technology Center
Electric Power Research Institute (EPRI)
Date: 06/01/92

DOE's Pittsburgh Technology Center (PTC), in consultation with Electric Power Research Institute, will select eight coal-fired power plants for a study on air toxics. The study will include a database with emissions data on 20 configurations representative of coal plants throughout the US. The technologies which will be examined include: wet scrubbers, spray dryers, low-NOx burners, and Venturi-type controls. Analysis will focus on what these and other pollution controls do to air toxics, and the degree of removal. (Energy Report, 6/1/92)

Index Number: 231
Unique ID: 000138
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): Newman, GA, 04 U.S.A.
, OH, 05 U.S.A.
Companies: Georgia Power Company Yates
Ohio Edison Niles
Date: 06/01/92

The Chiyoda scrubber contacts coal flue gases through bubbling action, and the process is expected to remove 90 percent of all particulate matter. The technology will be demonstrated at Georgia Power Company's Yates plant in

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Newman, GA. The process is also being tested at Ohio Edison's Niles plant.
(Energy Report, 6/1/92)

Index Number: 232
Unique ID: 000143
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
low/medium sulfur coal
natural gas
Location(s): , OH, 05 U.S.A.
Companies: American Electric Power Gavin
American Electric Power Muskingum River
American Electric Power Mitchell
American Electric Power Tanners Creek
American Electric Power Beckjord
Date: 05/04/92

American Electric Power (AEP) has cut the cost of scrubbing its Gavin plant. Among the changes are plans to find an outside party to finance, own, and lease back to AEP the two scrubbers planned for the Gavin plant in Ohio. Preconstruction of scrubbers is underway and, if built, the scrubbers would likely be operating by Jan. 1, 1996. In addition, there are plans for a switch to low-sulfur Eastern coal at Muskingum River Unit 5 and the Mitchell plant, medium-sulfur coal at Tanners Creek 4, Beckjord 6 and Kammer 1-3. Also, four units, Conesville 1-3 and Picway 5, would be switched entirely to natural gas during non-peak times for gas prices (gas prices peak in the winter), with coal as a backup. (Coal and Synfuels Technology, 5/4/92)

Index Number: 233
Unique ID: 000144
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
SO2 controls
Location(s): Hammond, IN, 05 U.S.A.
Companies: Northern Indiana Public Service Company
Pure Air
U.S. Gypsum Co.
Mitsubishi Heavy Industries
Air Products & Chemicals
Date: 10/06/92

Northern Indiana Public Service Company (NIPSCO) will have the first U.S. plant in compliance with Phase I regulations. A \$150 million Pure Air scrubber will be operational as of June 2, 1992, putting it 2.5 years ahead of the Phase I deadline. The scrubber will remove 90 percent of the sulfur

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dioxide, producing 1,140 tons of gypsum by-product daily. The gypsum will be sold to the U.S. Gypsum Co. for use in manufacturing wallboard. The scrubber will enable NIPSCO to continue burning high-sulfur Illinois Basin coal. (Utility Environment Report, 5/1/92) Northern Indiana Public Service Co. (NIPSCO), Hammond, IN, spent \$120 million to install a flue-gas desulfurization system to remove sulfur dioxide from its 528 megawatt Bailly Generating Station. The facility will use the Pure Air system in the largest single absorber for high sulfur coal in the world to remove 90% of SO₂ for Bailly units 7 and 8. The scrubbing unit only consumes 2% of the station's power, as compared to 5% for most current scrubbers. The system has reportedly demonstrated the ability to achieve target removal rates of 95% or higher. The technology absorbs and neutralizes SO₂ gases by mixing it with wet limestone, creating 96% pure reusable gypsum. The by-product is sold to U.S. Gypsum for use in wallboard products. Pure Air owns and operates the scrubber under a 20-year agreement with NIPSCO. (Coal and Synfuels Technology, 8/31/92, v. 13, No. 34; and Energy Daily, 8/31/92) Using a flue-gas desulfurization process, Indiana's Pure Air power plant, a partnership between Air Products & Chemicals, Inc. and Mitsubishi Heavy Industries, Inc., is reportedly achieving over a 90% reduction in SO₂ emission. The coal-burning plant is located at Northern Indiana Public Service Company's Bailly Station on Lake Michigan. A wallboard manufacturer will purchase the plant's high quality gypsum by-product. The project's cost of \$150.5 million is being partially funded by a DOE grant of \$63.4 million for the three year program to achieve SO₂ reductions two years prior to the Clean Air Act requirements. (Clean Air Network Online Today, 10/6/92)

Index Number: 234
Unique ID: 000147
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
NOx controls
Location(s): , VA, 03 U.S.A.
Companies: Virginia Power Clover
Old Dominion Electric
Date: 04/13/92

Virginia Power expects its new Clover plant in South-Central Virginia will result in a 76,000-ton net cut in SO₂ emissions and an 11,000-ton net drop in NOx emissions in the second half of the 1990s. The first Clover unit will come on line in 1995, followed a year later by the second unit. The 786-MW plant, a joint project with Old Dominion Electric, will be equipped with scrubbers, as well as controls on NOx emissions. Virginia Power holds a 50 percent share of the Clover plant and will operate it. Old Dominion Electric, the other partner, is overseeing its construction which, began in February. (Coal Outlook, 4/13/92)

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Index Number: 235
Unique ID: 000150
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
SO2 controls
injection systems
Location(s): , VA, 03 U.S.A.
Companies: Virginia Electric Power Company
Asea Brown Boveri, Inc.
U.S. Environmental Protection Agency
Date: 04/06/92

Virginia Electric Power Co. (VEPCO) will host a clean coal demonstration to begin optimization testing of a dry scrubbing technique designed to cut SO2 emissions from coal-fired boilers in half. Formal demonstration of the Lime Injection Multistage Burner (LIMB) will begin later and will continue through early 1993. ABB-Combustion Engineering is the project contractor. EPA will provide the bulk of the funding for this project and will collect and analyze the data. LIMB's market consists of about 200 coal-fired plants in the U.S. that will have to lower SO2 emissions. There is no known LIMB process operating commercially in the U.S. (Coal & Synfuels Technology, 4/06/92, V. 13, No. 14)

Index Number: 236
Unique ID: 000156
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
emissions credits/trade
Location(s): , WV, 03 U.S.A.
Companies: Allegheny Power System Harrison
Date: 03/30/92

Allegheny Power System plans to scrub its Harrison plant in West Virginia, with an in-service date of Jan. 1, 1995. APS is a leader in forming a credit pool to distribute bonus emissions credits from EPA, so pro rata distribution from the pool may be a virtual guarantee the scrub will go forward. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 237
Unique ID: 000157
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): , , U.S.A.
Companies: Atlantic Electric England

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Date: 03/30/92

Atlantic Electric plans to have a scrubber operating on Unit 2 of its England plant by Jan. 1, 1995. A scrub of Unit 1 is possible by Jan. 1, 1997, or could be delayed until the year 2000. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 238
Unique ID: 000159
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): , IN, 05 U.S.A.
Companies: Indianapolis Power & Light Petersburg
Date: 10/30/92

Indianapolis Power & Light plans to include a scrub of units 1 and 2 at the Petersburg plant. (Energy Report, 3/30/92, V. 20, No. 13) Indianapolis Power & Light (IP&L) announced plans to install scrubbers in many of their facilities. The IP&L project involves the investment of flue gas desulfurization, wet lime scrubbers, and a switch to low-sulfur Indiana coal. Two units already being scrubbed have experienced a 34% reduction in SO2 emissions, even though coal consumption has increased by more than 50%. (Clean Air Network Online Today, October 30, 1992)

Index Number: 239
Unique ID: 000160
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): Indiana, PA, 03 U.S.A.
Companies: Keystone-Conemaugh Projects Office
Date: 03/30/92

The Keystone-Conemaugh Projects Office plans to scrub Units 1 and 2 at the 1,700 MW Conemaugh plant in Indiana, PA. The Unit 1 scrubber would be on-line by Jan. 1, 1995, with the Unit 2 scrubber in service by Jan. 1, 1996. (Coal and Synfuels Technology, 3/16/92, V. 13, No. 11 and Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 240
Unique ID: 000161
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): , NY, 02 U.S.A.
Companies: New York State Electric & Gas Milliken

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Date: U.S. Department of Energy
03/30/92

New York State Electric & Gas has won initial approval from DOE for money to help build an advanced scrubber that will cover both units at its Milliken plant. Provided NYSEG can successfully negotiate the funding contract with DOE, the scrubber is due on-line in 1995. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 241
Unique ID: 000162
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): , IN, 05 U.S.A.
Companies: Northern Indiana Public Service Company Bailly
Date: 03/30/92

Northern Indiana Public Service Co. is building a DOE-backed advanced scrubber that will cover units 7 and 8 at its Bailly plant. The scrubber should be operating by the middle of this year. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 242
Unique ID: 000165
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): , KY, 04 U.S.A.
Companies: Big Rivers Electric Henderson
Date: 03/30/92

Big Rivers Electric is likely to scrub both units of the Henderson Station Two power plant in Kentucky. The utility recently considered a switch to low-sulfur coal instead, but scrubber vendors came in with low bids so a scrub is now probable. An in-service date for the scrubber is uncertain. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 243
Unique ID: 000166
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): , KY, 04 U.S.A.
Companies: Ownesboro Municipal Utilities Smith
Date: 03/30/92

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Owensboro Municipal Utilities plans one scrubber to cover both units at its Smith plant in Kentucky. The scrubber is scheduled to be operating in October 1994. (Energy Report, 3/30/92, V. 20, No. 13)

Index Number: 244
Unique ID: 000176
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): Clarksburg, VA, 03 U.S.A.
Companies: Allegheny Ludlum
Date: 03/08/92

Allegheny Ludlum signed a deal to provide 1.2 million pounds of stainless steel plate to use in the building of a new sulfur dioxide scrubbing unit at the company's power station in Clarksburg, VA. Recently, Allegheny Ludlum has positioned itself in contact with engineering firms and scrubber unit makers and other significant fabricators in an attempt to gain orders for approximately 100 facilities that must reduce sulfur by-products from burning coal. (Pittsburgh Business Times, PA, 3/08/92, pp. 1, 21)

Index Number: 245
Unique ID: 000177
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): Horsham, PA, 03 U.S.A.
Companies: Conversion Systems Inc.
Date: 02/24/92

Conversion Systems Inc. has developed a technology that produces commercial quality aggregate from flue gas desulfurization (FGD) wastes. Aggregate is used as a base material in paving and construction. The Horsham, PA-based company's technology, called Poz-O-Tec, produces an aggregate material from either forced oxidation or unoxidized scrubber sludge. Applications of the Poz-O-Tec process that are in operation at about 35 locations in the U.S. produce lightweight aggregate from wet scrubbing by lime, limestone or dual alkali FGDs. (Coal and Synfuels Technology, 2/24/92)

Index Number: 246
Unique ID: 000178
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
emissions credits/trade
Location(s): , TN, 04 U.S.A.
Companies: Tennessee Valley Authority Cumberland

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Asea Brown Boveri (ABB) Environmental Systems
United Engineers and Constructors
Geupel Construction

Date: 02/24/92

The Tennessee Valley Authority, in an effort to secure early SO2 emissions allowances from the Phase I technology reserve specified in Title IV of the Clean Air Act, has begun preliminary site work for a new scrubber before it makes a final scrub decision. TVA has awarded two major contracts for a scrubber at its Cumberland steam plant. Asea Brown Boveri (ABB) Environmental Systems has a \$69.6 million contract to build the scrubber and has already begun work. United Engineers and Constructors will design and manage the construction under a \$92.5 million contract. Geupel Construction, the first subcontractor, should complete preliminary site work by the end of June. Installation of the scrubber modules is scheduled to begin in the spring of 1993 and the on-line date is January 1, 1995, in time to meet the beginning of Phase 1. (Coal and Synfuels Technology, 2/24/92)

Index Number: 247
Unique ID: 000180
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
low/medium sulfur coal
Location(s): , KY, 04 U.S.A.
Companies: Kentucky Utilities Ghent
Kentucky Utilities Brown
Date: 02/24/92

Kentucky Utilities will add a scrubber at Ghent No. 1 and switch to lower sulfur coal at its Brown station to comply with Phase I of the Clean Air Act. The Ghent scrubber will begin operating no later than January 1, 1995. Ghent units 2-4 will continue to be fired by 1.2 lbs compliance coal. The second part of KU's Phase 1 compliance plan involves switching to lower sulfur coal at the Brown plant, for which the utility began reviewing bids this month. KU will award one or more contracts for 100,000 to 500,000 tons per year for terms ranging from 19 months to 8 years. (Coal Outlook, 2/24/92)

Index Number: 248
Unique ID: 000185
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): Mt. Storm, WV, 03 U.S.A.
Companies: Virginia Power Mt. Storm
General Electric Environmental Systems
ABB Combustion Engineering

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Date: 10/19/92

Virginia Power signed a contract to buy a \$140 million scrubber for the utility's Mt. Storm, W.Va. coal-fired plant. The scrubber will be built by General Electric Environmental Systems Inc. and will remove an estimated 50,000 tons of sulfur dioxide from the coal-fired plant's emissions. The scrubber is scheduled to begin operating by January 1995 in time to comply with Phase I of the Clean Air Act Amendments of 1990. (Energy Daily, 1/9/92)

Virginia Power's Mt. Storm Power station has signed a \$140 million contract with General Electric Environmental Systems of Lebanon, PA, to install a scrubber system that will reduce SO2 emissions by 50,000 tons/year at its Unit 3. (Coal and Synfuels Technology, October 19, 1992, v. 13, No. 41) ABB Combustion Engineering Services, Inc. was awarded a \$27 million contract for design and installation of low-NOx burners that are expected to realize a 50% decrease (20,000 tons/year) in NOx emissions at Virginia Power's Mt. Storm Power station. The controls should be in place by January 1, 1995. The burners will be installed on all three generating units and will alter the mix of fuel and air to reduce NOx emissions. (Coal and Synfuels Technology, 10/19/92, v. 13, No. 41)

Index Number: 249
Unique ID: 000187
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
NOx controls
SO2 controls
Location(s): , IN, 05 U.S.A.
Companies: Southern Indiana Gas & Electric Co. Culley
Indiana Utility Regulatory Commission
Southern Indiana Gas & Electric Co. Warrick
Date: 09/01/92

Southern Indiana Gas & Electric Co. (SIGECO) filed a \$120 million Phase I Clean Air Act compliance plan with the Indiana Utility Regulatory Commission. The plan describes the installation of a single scrubber facility at the utility's Culley Generation Station Units 2 and 3 by January 1, 1995, to remove about 95 percent of the sulfur dioxide from the flue gases. The utility also plans to retrofit the boilers on the two units with low NOx burners. For Phase II, which starts January 1, 2000, the utility plans to retrofit boilers at Culley Unit 1 and Warrick Unit 4 with Low NOx burners. (Energy Daily, 1/7/92) Southern Indiana Gas & Electric Co., Evansville, IN, reportedly plans to build a \$106.8 million scrubber system at its Culley Generating Station by January 1995. It is estimated that the project will create 10 jobs at the generating station as well as up to 150 construction jobs. (Sales Prospector - IL, IN, 9/92)

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Index Number: 250
Unique ID: 000295
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
SO2 controls
Location(s): , ,
Companies: Joy-Niro
ABB Flakt
Date: 08/31/92

According to lime and limestone suppliers, lime is expected to become the preferred reagent when Phase II scrubber technologies come on-line. Several technologies that offer higher SO2 removal efficiencies operate better with lime than with limestone, which currently is a more commonly used reagent. The higher pH of lime also makes it a better air toxics remover. Joy-Niro and ABB-Flakt are reportedly improving their semi-dry lime technologies. (Coal and Synfuels Technology, August 31, 1992, V. 13, No. 34)

Index Number: 251
Unique ID: 000334
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
Location(s): Chesire, OH, 05 U.S.A.
Companies: Ohio Power
Date: 12/14/92

Ohio Power will build five gas scrubbers at its 2,600 MW plant in Chesire, OH. The company has reportedly already committed more than \$117 million to the project. (Air Water Pollution Report, 12/14/92, V. 30, No. 49)

Index Number: 252
Unique ID: 000335
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
SO2 controls
Location(s): Wickliffe, OH, 05 U.S.A
Companies: Bailey's Controls
Date: 09/27/92

Bailey's Controls of Wickliffe, OH, is poised to take advantage of what it says will be exploding demand for pollution control equipment by electric utilities. The nationwide market for controls needed to regulate scrubbers that clean emission from coal-powered plants is estimated to be \$130 million. Bailey estimates that more than 100 coal-burning power plants in the U.S. will

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install flue gas desulfurization. The mechanism on Bailey's control system is computer-based to control the amount of limestone used in the scrubber system. (Crain's Cleveland Business (OH), 9/27/92, p. 6)

Index Number: 253
Unique ID: 000343
Main Category: COAL\ACID RAIN
Projects Type(s): scrubbers
NOx controls
SO2 controls
Location(s): Frankfurt, , Germany
Munster, , Germany
Dusseldorf, , Germany
Companies: Degussa
Lurgi
Lentjes
Date: 11/04/92

Degussa, of Frankfurt, Germany, is reportedly considering introducing a non-gypsum-forming flue-gas desulfurization technology called Desonox, in the U. S. The process, which began large-scale pilot plant operation in 1991 at a power plant in Munster, was developed with Lurgi of Frankfurt and boiler manufacturer Lentjes of Dusseldorf. In the process, the flue gases are mixed with ammonia and fed into the reactor, where the NOx is catalytically converted into nitrogen and water and the SO2 is oxidized to sulfur trioxide, which is then converted into sulfuric acid. (Chemical Week, 11/4/92, p. 25)

Index Number: 254
Unique ID: 000146
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
Location(s): , , U.S.A.
Companies:
Date: 04/22/92

Flue Gas Desulfurization (FGD) systems, installed to help utilities decrease their SO2 emissions, are now at a minimum 95 percent removal level. Cost-reducing advances in FGD technology include the production of commercial by-products, such as gypsum, of which 20 to 30 million tons per year are consumed in the U.S. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 255
Unique ID: 000149

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Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
scrubbers
NOx controls
low/medium sulfur coal
Location(s): , , U.S.A.
Companies: PSI Energy Gibson
PSI Energy Cayuga
PSI Energy Wabash River
PSI Energy Gallagher
PSI Energy Edwardsport
Date: 08/31/92

Switching to blends of medium sulfur coal is the main feature of PSI Energy's plan to comply with Phase 1 SO2 emissions reduction requirements. The plan involves: upgrading electrostatic precipitators at Gibson units 1 and 2 and switching to a medium-sulfur blend of coal; using flue gas conditioning and a medium-sulfur blend of coal at Gibson 3; Gibson 4 is scheduled for a scrubber installation, with Gibson 5 already scrubbed; Cayuga 1 and 2 will get flue gas conditioning and a medium-sulfur coal blend; Gallagher 1-4 is scheduled for flue gas conditioning and a medium-sulfur coal blend; and Wabash River 1-6 will get upgraded ESPs, with Wabash 6 switched to a medium-sulfur coal blend. Low-NOx burners will be installed on all of the units at Gibson, Cayuga, Gallagher, and Wabash River. One of the Wabash River units may also be repowered with integrated gasification-combined cycle technology from Destec Energy. Additional tentative plans for Phase 2 compliance feature two scrubbers for Cayuga 1 and 2, and flue gas conditioning at Wabash 1-5. Low-NOx burners would be installed at all units of the Edwardsport and Noblesville plants. PSI is also looking at a blend of 60 percent Powder River Basin coal and 40 percent Illinois Basin coal at Gibson 1-3 for Phase 2 compliance. (Coal & Synfuels Technology, 4/06/92, V. 13 N O. 14) New electrostatic precipitators (ESPs) and low NOx burners in Gibson units 1 and 2 are expected to allow PSI Energy to continue burning Wabash coal, while meeting emissions requirements. Tie-ins for the Unit 1 equipment are expected to be made by Fall 1992. The new Unit 1 precipitator is reportedly 82% complete. The ESPs will allow PSI to burn more low-sulfur coal. (Coal Outlook, August 31, 1992, v. 16, No. 33) PSI Energy of Indiana plans to scrub Unit 4 of its Gibson plant with an in-service date in late 1994. (Energy Report, 3/30/92, v. 20, No. 13)

Index Number: 256
Unique ID: 000171
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
Location(s): Indiana, PA, 03 U.S.A.
Companies: Pennsylvania Electric Co. Conemaugh

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Date: 03/16/92

Pennsylvania Electric Co., will reportedly install a flue gas desulfurization system at its 1,700-MW Conemaugh plant in Indiana, PA. (Coal & Synfuels Technology, 3/16/92, V. 13, No. 11)

Index Number: 257
Unique ID: 000175
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
clean coal tech-other
injection systems
Location(s): , TN, 03 U.S.A.
Companies: U.S. Environmental Protection Agency
Tennessee Valley Authority Shawnee
Date: 03/01/92

The effectiveness of future SO2 removal technologies may be judged in comparison to EPA's new advanced silicate (ADVACATE) control technique. While not yet commercially available, the technology will remove more than 90 percent of the SO2 produced during coal combustion, but will cost only half as much as conventional wet scrubbers, measured both in terms of capital and operating costs. Calcium silicate sorbent is injected into the exhaust duct downstream of the boiler, removing the SO2 without any need for a scrubbing vessel. The technique, which has been tested successfully on a pilot scale, is scheduled for field demonstration at the Tennessee Valley Authority's Shawnee plant in the next six months. The technology should be ready for commercial utility use by 1995. (Energy Daily, 3/01/91)

Index Number: 258
Unique ID: 000184
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
Location(s): San Diego, CA, 09 U.S.A.
Companies: Bachmann North America
Wahlco Environmental Systems
San Diego Gas & Electric Company
Date: 01/20/92

Bachmann North American, a subsidiary of Wahlco Environmental Systems, Inc., has booked flue gas desulfurization damper orders in excess of \$10 million from North American utilities that are building scrubbers. Wahlco designs and manufactures air pollution-control and power-efficiency equipment and provides related services to electric utilities and industrial manufacturers. Eighty

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percent of Wahlco is owned by San Diego Gas and Electric Company. (Coal and Synfuels Technology, 1/20/92)

Index Number: 259
Unique ID: 000294
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
gasification
Location(s): Schenectady, NY, 02 U.S.A.
Companies: General Electric Company
Date: 11/30/92

General Electric Co. reportedly has successfully completed more than 400 hours of pilot plant testing on a new hot gas cleanup (HGCU) system that reduces emissions of SO2 by removing almost all of the hydrogen sulfide present in the gas before it is sent to the gas turbine for power generation. It is reported that the testing, performed at GE's Research & Development Center in Schenectady, NY, further demonstrated the environmental compatibility of converting coal to gas to generate electricity. (Oil and Gas Journal, November 30, 1992, p. 54)

Index Number: 260
Unique ID: 000333
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
NOx controls
COx controls
Location(s): Gillette, WY, 08 U.S.A.
Companies: Encoal Corporation
SGI International
Tek-Kol
Date: 12/23/92

Encoal Corporation, with SGI, and Tek-Kol, tested the "liquids from coal" (LFC) process as a viable clean air coal technology at its demonstration facility in Gillette, WY, with reported success. LFC uses computer-controlled pyrolysis which processes high-moisture coal characterized by a low-heating value, creating high-heating valued coal and oil. Both the coal and the oil meet SO2, NOx, and CO2 emissions reduction requirements. The LFC process may be a cheaper way to comply with emission regulations than flue gas scrubbing. The low moisture content of the coal reportedly will reduce transportation costs. The LFC process could significantly increase the market potential for Western coal refineries and be used in other processes on the east coast. (Clean Air Network Online Today, 12/23/92)

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Index Number: 261
Unique ID: 000345
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
Location(s): , ,
Companies: Dow Chemical Company
Combustion Gas Systems
Date: 05/01/92

In April 1992, Dow Chemical Co. formed a new business unit, Combustion Gas Systems, to commercialize a proprietary technology for reducing sulfur emissions from coal-burning power plants. The technology was developed out of the firm's existing R&D base for removal of H₂S and CO₂ from natural gas and oil refining streams. (Environmental Business Journal, 5/92, V. 5, No. 5)

Index Number: 262
Unique ID: 000346
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
Location(s): , , U.S.A.
Companies: Union Carbide
U.S. Department of Energy
Date: 05/01/92

Union Carbide's CanSolv system was chosen by the DOE as a part of the Clean Coal Technology program and is said to recover 99% of SO₂ and eliminate virtually all sludge by-products. (Environmental Business Journal, 5/92, V. 5, No. 5)

Index Number: 263
Unique ID: 000348
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
scrubbers
clean coal tech-other
modeling (computer)
Location(s): Austin, TX, 06 U.S.A.
Hallsville, TX, 06 U.S.A.
Merom, IN, 05 U.S.A.
Elrama, PA, 03 U.S.A.
Somerset, NY, 02 U.S.A.
Companies: Radian Corporation
Hoosier Energy
Southwestern Electric Power

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Duquesne Light
New York State Electric & Gas
11/18/92

Date:

In November 1992, DOE awarded a \$2 million contract to Radian Corp. of Austin, TX, to test how effectively chemical additives control the acidity levels of the slurry and liquids that absorb sulfur, effecting the efficiency of the scrubber. The chemicals also may improve the limestone's solubility, which improves efficiency. Radian will use sodium formate, di-basic acid and ethylene diamine tetracarboxylic acid in the tests. One these tests has begun at Tampa Electric's 455 MW Big Bend Station unit 4 using di-basic acid. Other tests will take place at Hoosier Energy's 490 MW Merom Station in Merom, IN; Southwestern Electric Power Company's 720 MW Pirkey Station in Hallsville, TX; Public Service of Indiana's 661 MW Gibson Station in Owensville, IN; Duquesne Light's 500 MW Elrama Station in Elrama, PA; and New York State Electric & Gas Corp.'s 625 MW Kintigh Station in Somerset, N.Y. A goal of the DOE-sponsored tests will be to validate an EPRI computer model that predicts how scrubbers will operate at full load based on its small-scale tests. Other firms involved in the project include Stone & Webster, Sargent & Lundy and Ebasco. (Energy Daily, 11/18/92, V. 20, No. 222)

Index Number: 264
Unique ID: 000352
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
NOx controls
Location(s): Berkeley, CA, 09 U.S.A.
Companies: Bechtel Corporation
University of California, Berkeley
Date: 01/05/93

A process known as PhoSNOX is being tested by Bechtel Corporation and the University of California at Berkeley and so far has resulted in the reported removal of 90 percent of SO2 and NOx emissions from flue gas. During the PhoSNOX process, NO is oxidized to NO2 when yellow phosphorus is added to the wet scrubbing system causing O2 to become O3. NO2 and SO2 become ammonium sulfate and gypsum when removed by dissolution from the flue gas, while the phosphorus becomes phosphoric acid after oxidation. Testing was done on NOx concentrations ranging from 60 to 660 ppm. Performance and feasibility testing continues at the University of California's Lawrence Berkeley Laboratory. (Clean Air Network Online Today, 1/5/93)

Index Number: 265
Unique ID: 000353
Main Category: COAL\ACID RAIN

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Projects Type(s): SO2 controls
 ESPs
 dryers
 scrubbers
Location(s): , KY, 04 U.S.A.
Companies: Tennessee Valley Authority
 AirPol
Date: 12/14/92

The Tennessee Valley Authority (TVA)--with 59 coal-burning electric generating plants--believes that AirPol's Gas Suspension Absorption (GSA) system will be cheaper than conventional scrubbers in removing toxics. The GSA has a vertical reactor where flue gas meets up with suspended solids, lime, reaction products, and fly ash. The exit gas stream goes through an electrostatic precipitator before venting to the atmosphere. The TVA unit that is about to start up is connected to a 10-MW slipstream of flue gas from a 150-MW Shawnee Fossil Plant in Kentucky. The GSA system is reported to be the only semi-dry process that offers SO2 removal rates comparable to the more costly and more complex wet flue gas desulfurization (FGD) systems. The system also has relatively lower sorbent-use rates and may perform better than dry systems while being cheaper and more effective than spray dryers. (Air Quality Week, 12/14/93)

Index Number: 266
Unique ID: 000355
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
 NOx controls
 injection systems
Location(s): Merion Station, PA, 03 U.S.A.
Companies: Coal Tech Corporation
Date: 11/01/92

Recent tests with a 20 MMBtu/hour slagging coal combustor have achieved 90 to 95 percent reduction of SO2 emissions following injection of calcium hydrate into the combustor, Coal Tech Corp. of Merion Station PA, reported. Additional tests are planned to refine operations and achieve nearly 100 percent reduction. The combustor was retrofitted to an oil-designed package boiler and developers are now planning to apply the unit to industrial combined gas-steam turbine power plants of 5-20 MW. Nitrogen oxide emissions are reduced by operating the system fuel-rich and SO2 control is achieved by Coal Tech's patented process for injecting into the combustor. This is based on non-equilibrium chemical capture of the sulfur by the sorbent, which is retained in the slag. (AirTECH News, 11/92, p. 155)

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Index Number: 267
Unique ID: 000356
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
NOx controls
injection systems
dryers
Location(s): Denver, CO, 08 U.S.A.
Companies: Public Service Co.
Date: 11/01/92

A system combining low-NOx burners, overfire air, urea injection, dry sorbent injection using calcium and sodium-based sorbents, and a humidification system has been installed by Public Service Co. of Denver, CO, at its 100 MW roof-fired Arapahoe 4 steam electric generating station. The goal is to demonstrate 70 percent reduction in both SO2 and NOx emissions. (AirTech News, 11/92, p. 156)

Index Number: 268
Unique ID: 000357
Main Category: COAL\ACID RAIN
Projects Type(s): SO2 controls
clean coal tech-other
Location(s): Pittsburgh, PA, 03 U.S.A.
, , Poland
Companies: Custom Coals Corporation
Date: 11/01/92

Custom Coals Corp. of Pittsburgh, PA, plans to build 10 plants in the U.S. by the year 2000 to remove up to 90 percent of the pyritic sulfur from high-sulfur coals and to produce a self-scrubbing coal in which pelletized limestone is added to the fuel. The company estimates that more than 150 billion tons of high-sulfur U.S. coal reserves could meet sulfur requirements using the cleaning technology. Polish government officials have also reportedly asked for a feasibility study to assess the potential for constructing 14 coal cleaning plants with a total capacity of 50 millions tons/year in that country. (AirTECH News, 11/92, p. 156)

Index Number: 269
Unique ID: 000197
Main Category: MOBILE SOURCES
Projects Type(s): battery technology
electric vehicle
Location(s): , , U.S.A.
Companies: U.S. Council for Automotive Research (USCAR)

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Chrysler Corporation
Ford Motor Co.
General Motors Corporation

Date: 06/15/92

Chrysler Corp., Ford Motor Co., and General Motors announced the formation of the U.S. Council for Automotive Research (USCAR). The group will work to develop automotive technologies, such as electric vehicle batteries and auto body materials that combine lighter weight with greater durability. U.S. industries, like oil companies, will be invited to join the U.S. Council for Automotive Research (USCAR) in its efforts to craft the technology that will power the next century's vehicles. The goal is to engage in a joint air quality research program to analyze the best ways of reducing gasoline aromatics, olefins, vapor pressure, and sulfur (Energy Report, 6/15/92)

Index Number: 270
Unique ID: 000203
Main Category: MOBILE SOURCES
Projects Type(s): battery technology
Location(s): , IL, 05 U.S.A.
Companies: Argonne National Laboratory
Date: 05/01/92

Argonne National Laboratory, IL, has developed a battery with a lithium-aluminum alloy for the negative electrode and iron disulfide at the other pole. The solid electrodes on the battery are considered to be safe at the more than 300-degree-Celsius operating temperature for batteries. These batteries are made from thin layers of lithium for the negative electrode, a high-energy dense material such as vanadium oxide for the positive electrode, and a polymer electrolyte between the two electrodes. The films achieve five times the energy capacity of lead acid and could be rolled up and molded into any nook or cavity designed for them by automakers. (Scientific American, 5/92, p. 127)

Index Number: 271
Unique ID: 000227
Main Category: MOBILE SOURCES
Projects Type(s): battery technology
electric vehicle
Location(s): , , U.S.A.
Companies: U.S. Advanced Battery Consortium
Electric Power Research Institute (EPRI)
U.S. Department of Energy
Ford Motor Co.
BMW

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Date: 05/01/92

Ford, Chrysler, and GM have formed the Battery Consortium along with the Electric Power Research Institute and the Department of Energy, which has set aside \$260 million in funding to find ways to increase the range of vehicles, reduce the weight of the vehicles, and bring costs down. (Chemical Marketing Reporter, 2/17/92, p. SR16) The Department of Energy is funding a four-year, \$260 million effort consisting of a series of contracts for research by U.S. automakers and suppliers on critical battery technology. Funding for the U.S. Advanced Battery Consortium now totals \$27 million to be applied to the accelerated development of four battery technologies. By 1994, the USABC wants its subcontractors to set up pilot plants that will demonstrate the feasibility of producing thousands of batteries with double or triple the energy capacity of lead-acid ones. By decade's end, USABC wants to have a battery that allows an electric car to accelerate like a roadster, go from Los Angeles to San Francisco without a recharge, and last the lifetime of the vehicle. Two kinds of advanced batteries are promising: nickel metal hydride and sodium sulfur, of which sodium sulfur is closest to being ready for the commercial marketplace and is being tested in BMWs, Fords, Volkswagens, and other vehicles. (Scientific American, 5/92, p. 126)

Index Number: 272
Unique ID: 000194
Main Category: MOBILE SOURCES
Projects Type(s): catalysts
Location(s): Iselin, NJ, 02 U.S.A.
Neinburg, , Germany
Companies: Engelhard Corporation
Engelhard Kali-Chemie
Solvay
Date: 07/08/92

Engelhard (Iselin, NJ) bought out Solvay's share of a 50/50 joint venture, Engelhard Kali-Chemie, and announced plans for a \$25-million auto catalysts plant in Neinburg, Germany, that will triple its European capacity to 6 million catalytic units/year. (Chemical Week, 7/08/92)

Index Number: 273
Unique ID: 000214
Main Category: MOBILE SOURCES
Projects Type(s): catalysts
catalytic converters
Location(s): , ,
Companies: Corning GmbH
Date: 04/23/92

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Corning GmbH introduced its thin wall substrate for catalytic converters in 1990. This substrate was initially developed to meet European vehicle manufacturer requirements. Corning also unveiled the prototype of a new electrically heated catalyst which is designed to meet the cold start segment of the ultra low emissions requirements. In laboratory tests, this system meets or exceeds the California 1997 ultra low emission requirements. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 274
Unique ID: 000207
Main Category: MOBILE SOURCES
Projects Type(s): catalytic converters
catalysts
Location(s): , , U.S.A.
Companies: Corning Inc.
Date: 04/23/92

In researching ceramic catalytic converters, Corning Inc. has developed a new, low-expansion ceramic material that combats thermal shock and corrosive agents and an extrusion process invention that provides substrate with its distinctive honeycomb structure needed to for a large amount of surface area in a very small volume. Added surface area increased overall conversion efficiency by 14 percent. In 1990, Corning released two cell core XT (extra-thin) substrates that use newer, more dense ceramic material. The 475 unit provides added surface area and improved conversion efficiency by 24 percent. The 355.5 reduces back pressure by 14 percent without compromising conversion efficiency. These units save space and weight and are made from low-cost ceramic materials. Corning has also worked on electrically heated catalyst units which combine electrically heated metal substrate with a standard cellular ceramic substrate. The heated catalyst starts the catalytic converter and converts most emissions during the cold phase when most pollutants are emitted. Durability and energy requirements are further research issues. The unit takes less than 5 seconds to preheat prior to ignition and begins to convert emissions immediately thereafter in contrast to today's converters which take two minutes to heat up. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 275
Unique ID: 000208
Main Category: MOBILE SOURCES
Projects Type(s): catalytic converters
catalytic technology
Location(s): Hiram, OH, 05 U.S.A.

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Companies: W.R. Grace & Company
Camet Corporation
Date: 04/23/92

Camet Corp., Hiram OH, a division of W.R. Grace, has researched electrically heated converters (EHCs). EHC systems are reported to be the most effective and eliminate an average of 85 percent of emissions from the first 505 seconds of operation of a car. Working with auto manufacturers, Camet is integrating the electronic controls from the EHC with the engine logic controls and the large-scale integrated circuits provided by auto companies for an integrated system solution to emissions requirements. The Grace/Camet EHC core is formed from a metal foil about 2 mills thick and weighing 0.01 pounds/cubic inch, yet required to withstand hot shake tests at 1850 degrees Fahrenheit. The EHC system is expected to cost auto manufacturers \$200-\$300 and will weigh between 25 and 40 pounds. The system has met California standards and Grace/Camet will soon be preparing for full-scale production of the EHC core with expected installation for the 1997 model year, as required by the California timetable. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 276
Unique ID: 000215
Main Category: MOBILE SOURCES
Projects Type(s): catalytic converters
Location(s): , CA, 09 U.S.A.
Companies: Ford Motor Co.
Date: 04/15/92

Ford Motor Co. has announced plans to sell new, ultraclean 1993 Ford Escorts and Mercury Tracers in California beginning in the summer of 1992. Employing a larger catalytic converter, placed closer to the engine, these new vehicles meet the state's tough 1997 emissions limits according to Air Resources Board tests. The new Escorts and Tracers emit just one percent of the emissions of a similar 1972 car. (USA Today, 4/15/93)

Index Number: 277
Unique ID: 000205
Main Category: MOBILE SOURCES
Projects Type(s): catalytic technology
catalysts
COx controls
NOx controls
Location(s): , , U.S.A.
Companies: Allied-Signal
Date: 04/23/92

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Because catalytic conversions to reduce mobile source emissions require high temperatures, Allied-Signal has focused on technologies with higher temperature applications in addition to a 100,000-mile durability requirement. One technology involved equipping a vehicle with an underfloor catalyst and a manifold cat which led to the development of a closed couple technology that meets California LEV standards. Ongoing work is being conducted to meet ULEV standards with this technology. Palladium, a relatively low-cost metal, used as a catalyst to convert CO, NOx and hydrocarbon, meets 1992 and 1993 emission standard levels with a life-span of 100,000 miles. More advanced palladium catalyst technologies are currently being tested with promising results. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 278
Unique ID: 000206
Main Category: MOBILE SOURCES
Projects Type(s): catalytic technology
Location(s): , , U.S.A.
Companies: Allied-Signal
ULP Inc.
Date: 04/23/92

Allied-Signal and ULP, Inc. are developing an absorber catalytic system that converts hydrocarbons before releasing them. The absorber material can be used with ceramic, metallic, foam, and other types of substrates. Several new technologies being developed can be combined to achieve optimal hydrocarbon removal levels while improving high temperature performance, hydrocarbon absorption capacity, and the time taken by the absorber material to hold onto the hydrocarbon before releasing it. Catalytic technologies are also being developed for alternative fuels including natural gas and organic emissions. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 279
Unique ID: 000372
Main Category: MOBILE SOURCES
Projects Type(s): clean fuels - other
methanol
natural gas vehicle (NGV)
Location(s): , , U.S.A.
Companies: Detroit Diesel Corporation (DDC)
Date: 11/01/92

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Detroit Diesel Co. (DDC) offers two types of alcohol-fueled engines. A hybrid type (M-85) burns 85% alcohol and 15% diesel fuel. An (M-100) burns 100% methanol. The engines are reportedly built for methanol use, however they have new materials that are compatible with other fuel types, a higher compression ratio, and use glow plugs and a glow plug controller to assist in cold starting and light load operation. The DDC V6-92TA has been developed to burn CNG and LNG. (Beverage Industry, 11/92, p. 33)

Index Number: 280
Unique ID: 000192
Main Category: MOBILE SOURCES
Projects Type(s): combustion technology
Location(s): Tigard, OR, 10 U.S.A.
Companies: Acro-Tech Inc.
Date: 01/01/92

Acro-Tech Inc. of Tigard, Oregon is developing a Vented Two-Stage Valving project that demonstrates how the induction process of internal combustion engines can be improved. The induction cycle moves air and fuel molecules from an inlet venturi to a cylinder where the fuel molecules are broken up so they can be burned efficiently. Unlike standard poppet valves, vented valves consist of two pieces and two function designs that reduces mechanical stress and increases efficiency in air flow dynamics. Improved engine performance, decreased emissions, and enhanced fuel efficiency are expected as a result of creating a more dilute, homogeneous induction charge, and by better controlling the induction process timing. (EPA Announcement of 1992 Small Business Pollution Prevention Grants awarded)

Index Number: 281
Unique ID: 000195
Main Category: MOBILE SOURCES
Projects Type(s): combustion technology
Location(s): , , U.S.A.
Companies: Honda
Date: 06/29/92

The highly fuel efficient Honda Civic VX uses "lean-burn" technology that includes a variable valve-timing and lift control mechanism in the operating system. This mechanism allows the engine to run at "lean" air-fuel ratios. Although engines do not typically work well running at lean ratios (meaning more air is present than required), the Honda's system takes one of the intake valves out of action at low engine speeds in order to create a swirl effect in the combustion chamber which creates turbulence and a stratified charge to provide stable combustion. (Automotive News Insight, 6/29/92, p. 20)

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Index Number: 282
Unique ID: 000200
Main Category: MOBILE SOURCES
Projects Type(s): combustion technology
diesel technology
SO2 controls
Location(s): , , U.S.A.
Companies: Navistar International Transportation Corp.
Date: 05/25/92

Navistar International Transportation Corp. will reportedly begin offering its "smokeless diesel" engine in September 1992. The DTA 466, a 7.6-liter six cylinder diesel, rated at 210 horsepower and 646 pounds-feet of torque, will be available in selected 3000-series school buses and 4000-series medium-duty 1993 trucks. The engine uses a high-pressure, mechanical fuel injection system and runs on low sulfur fuel. (Automotive News, 5/25/92, p. 18)

Index Number: 283
Unique ID: 000201
Main Category: MOBILE SOURCES
Projects Type(s): combustion technology
diesel technology
Location(s): Rome, NY, 02 U.S.A.
Companies: Rome Locomotive Works
Date: 05/18/92

Rome Locomotive Works, in Rome, NY, has announced a micro-processor-based prime-and-warmup system for diesel locomotives that would allow a train to stand idle without the engines running. Not only is this reportedly able to save the nation's 13 largest railroads 300 million gallons of fuel annually, but it would also sharply reduce the release of air pollutants. (Air Water Pollution Report, 5/18/92)

Index Number: 284
Unique ID: 000220
Main Category: MOBILE SOURCES
Projects Type(s): combustion technology
diesel technology
Location(s): Clifton, NJ, 02 U.S.A.
Fort Worth, TX, 06 U.S.A.
Companies: Inset Industries
Date: 03/30/92

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Inset Industries of Clifton, NJ, has developed the Fuel Stabilizer, an anti-pollution device that fits onto an automobile fuel line and is designed to cut tailpipe emissions to zero and improve fuel mileage. The Fuel Stabilizer costs between \$700 and \$1500. The Fuel Stabilizer reportedly works well on diesel engines as well as gasoline engines. The city of Fort Worth, TX, having used six Fuel Stabilizers in the past year, has found that they are effective in cutting emissions and, therefore, bought an additional 200 of the devices. (Clean Air Weekly, 3/30/92)

Index Number: 285
Unique ID: 000199
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): Boston, MA, 01 U.S.A.
Companies: Massachusetts Energy Office
Date: 06/05/92

The Massachusetts Energy Office is set to begin a pilot electrical vehicle program to give utilities, local governments, and the public an idea of what life with the technology would be like. Fifty commuter vehicles will be tested for four years in order to gather information on things like user comfort, user friendliness, and the ability to perform effectively during Northeastern winters. The 50 vehicles will be leased to commuters heading to Boston. The commuters will drive to outlying subway stops where recharging stands will be installed. At the recharging stands photo-voltaic arrays will be installed to compensate for the energy drain. The effort is part of a broader initiative to bring the Northeast's air quality in line with the 1990 Clean Air Act amendments. (Inside DOT & Transportation Week, 6/5/92)

Index Number: 286
Unique ID: 000217
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): , ,
Companies: Michelin
Date: 04/03/92

Anticipating that electric cars will become more prevalent in the future, Michelin has developed its Electron tire, a tire made specifically for electric cars. The tire reportedly provides reduced rolling resistance by producing a narrow tire with low tire envelope volume and high inflation pressure. It also controls tread noise through careful optimization of the tire tread pattern. (Rubber and Plastics News, 4/03/92, p.18)

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Index Number: 287
Unique ID: 000221
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): Santa Rosa, CA, 09 U.S.A.
Los Angeles, CA, 09 U.S.A.
Companies: Solar Electric Engineering Inc.
California Air Resources Board (CARB)
Los Angeles Department of Water & Power
Date: 03/30/92

Solar Electric Engineering of Santa Rosa, CA, is taking steps to build a network of electric car dealerships. The first dealership opened in Los Angeles in March, providing drivers with some big tax advantages: electric car drivers skip 17 cents federal and 15 cents state tax on motor fuels. The company has qualified with the California Air Resources Board for a \$1000 state tax credit. The company claims 3 cents per mile fuel cost which can fall to 1.5 cents per mile with a special recharging rate adopted by Los Angeles' Department of Water & Power, compared with 8 cents per mile for gasoline powered vehicles. The company has sold 105 cars, with sales last year of just under \$1 million; the company projected sales to hit \$24 million in five years. (Clean Air Weekly, 3/30/92)

Index Number: 288
Unique ID: 000291
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): Oriskany, NY, 02 U.S.A.
Schenectady, NY, 02 U.S.A.
Companies: Bus Industries of America
New York City Transit Authority
General Electric Company
Date: 11/08/92

New York State, New York City, utilities, and private businesses will develop a hybrid electric transit bus. The bus will be built by Bus Industries of America at its Oriskany plant and will be demonstrated by the New York City Transit Authority. General Electric Company's Research and Development Center in Schenectady is developing the electric motors and controllers for the bus. The engine of the bus reportedly will be about half the size of a conventional diesel bus engine and will reduce emissions by 30-50% and fuel consumption by 25%. (Crain's New York Business, 11/8/92, p. 57)

Index Number: 289
Unique ID: 000364

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Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): , CA, 09 U.S.A.
Companies: General Motors Corporation
South Coast Air Quality Management District (SCAQMD)
Date: 09/21/92

The "world's first" electric car pool began as a manager of General Motor's electric vehicle team and the chairman of California's South Coast Air Quality Management District will be sharing a ride in a GM battery-powered Geo Storm. (Automotive News, 9/21/92)

Index Number: 290
Unique ID: 000365
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): , CA, 09 U.S.A.
Companies: CALSTART
Date: 12/07/92

A California research and development group, CALSTART, representing private industry and public interest groups unveiled an electric concept car this week. The car was developed by aerospace and high-tech companies that are trying to convert from military to civilian work. The car is designed to show off components and technology that are available from local California suppliers and that have applications in electric vehicles. Estimates are that the car has a 120- to 140-mile range on a single charge with a top speed of 80 mph. CALSTART is also working on programs to develop infrastructure for charging stations in the state, an electric bus mass transit program and a program to develop a small electric vehicle for in-town commuting. (Automotive News, 12/7/92)

Index Number: 291
Unique ID: 000366
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
diesel technology
battery technology
Location(s): Dearborn, MI, 05 U.S.A.
Companies: Toyota
Hino Motors Ltd.
Date: 12/14/92

A Dearborn Toyota subsidiary, Hino Motors Ltd. has developed an electric motor designed to work with diesel bus engines that reportedly reduces pollution

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from individual buses by as much as 70 percent and increases the mileage by up to 9 percent. The electric motor kicks in to provide torque when accelerating or climbing grades, the least efficient moments for an internal combustion engine. The electric motor also serves as a generator/brake when decelerating, recharging the batteries. The Hino buses use a thin AC induction motor powered by 26 lead-acid batteries or 40 nickel-cadmium units. In tests, the engine-electric system reduced oxides of nitrogen by 28 percent and particulate exhaust by 70 percent. Production of the motor, called the HMIR engine, will increase through 1995 and eight buses are now on the road. Thirty such buses are planned for 1993 followed by 100 in 1994 and 200 in 1995. (Automotive News, 12/14/92)

Index Number: 292
Unique ID: 000407
Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): Oakland, CA, 09 USA
Chicago, IL, 05 USA
Boston, MA, 01 USA
Atlanta, GA, 04 USA
Washington, DC, 03 USA
Companies: National Station Car Consortium
Date: 02/02/93

The National Station Car Consortium, headquartered in Oakland, CA, announced in January, 1993, that transit authorities in Chicago, Atlanta, Boston, Los Angeles, Orange County CA, Sacramento, San Diego, San Francisco, and Washington, D.C. have committed to demonstrating 400 of the station cars. Station cars are battery-powered vehicles for access to and egress from line-haul mass transit trips. Station cars would be given preferential parking at urban and suburban transit stations and would increase the capacity of park-n-ride lots. The benefits of the car over a shuttle bus would be the freedom to run personal errands without the burdens of auto ownership. The Consortium is targeting individuals who want the benefits of car use without the responsibility and major employers who must reduce worker travel in order to comply with the Clean Air Act. The station car will have a range of about 45 miles in stop-and-go suburban and urban traffic, and be fully safety certified and freeway capable. Station cars would eliminate excessive tailpipe emissions from cold engine starts and operation for short trips with an internal combustion engine. The electric car station is targeted to started in 1995. (Chicago Tribune, 2/2/93, p. 1 and National Station Car Consortium, 1/14/93, Washington, D.C.)

Index Number: 293
Unique ID: 000408

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Main Category: MOBILE SOURCES
Projects Type(s): electric vehicle
Location(s): Santa Barbara, CA, 09 USA
Companies: APS Systems
Santa Barbara Metropolitan Transit District
Date: 01/29/93

The Santa Barbara Metropolitan Transit District (SBMTD)'s testing of a 30-foot, 27 passenger retrofitted bus will reportedly be completed in July 1993. The bus being tested is reportedly the most energy-efficient, high-performing, self-propelled, emission-free vehicle of its size. It can travel at up to 40 mph, climb steep hills, and operate up to 50 miles on a single charge. APS Systems of Oxnard replaced the 8.2-liter diesel engine, transmission, fuel tank, radiator, mufflers, and air and fuel-intake systems with two modular microprocessor-based AC vector drives produced by Indramat of Wood Dale, IL, mounted on the back of the bus. They were matched to two 30-horsepower AC induction motors with 230-volt AC blowers, installed in the former engine compartment of the bus. Two 80-volt Trojan lead/acid battery modules and four 40-volt battery modules were also installed. After evaluation of the bus, due in July, 1993, the SBMTD has the option of retrofitting up to 19 more buses. The Los Angeles Department of Water & Power, Pacific Gas & Electric, Sacramento Municipal Utility District, and Southern California Edison have also reportedly expressed interest in the SBMTD program. (California Report, 1/29/93, p. 9-10)

Index Number: 294
Unique ID: 000193
Main Category: MOBILE SOURCES
Projects Type(s): filters/traps
catalytic converters
Location(s): Union, NJ, 02 U.S.A.
Companies: Engelhard Corporation
General Motors Corporation
Chrysler Corporation
Nissan Motor Co. Ltd
Date: 07/27/92

Hydrocarbon traps have been developed as an alternative to heating the catalyst in order to reduce tailpipe emissions from a cold start. The traps work by collecting emissions from engines in the first minutes after an engine's operation in a zeolite storage cell that acts as a sponge or filter. Zeolites are a family of hydrated aluminosilicate minerals that have an affinity for hydrocarbons while cool. After the zeolite trap warms, emissions are released for treatment by a standard catalytic converter. General Motors, Chrysler Corp., Nissan Motor Corp. Ltd., and Engelhard Corp. have indicated that traps could potentially offer similar tailpipe cleanup to pre-heating

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catalysts, but more cheaply, easily, and fuel efficiently. Work at Engelhard's labs in Union, NJ, shows that traps would not affect the way vehicles drive or their fuel economy. (Automotive News, 7/27/92, p. 35)

Index Number: 295
Unique ID: 000198
Main Category: MOBILE SOURCES
Projects Type(s): filters/traps
catalytic converters
Location(s): Iselin, NJ, 02 U.S.A.
Companies: Engelhard Corporation
Date: 06/15/92

Engelhard Corporation of Iselin, NJ, has developed a way of solving the cold start problem in meeting more stringent auto emissions standards. The problem is that pollution is unchecked during the two minutes it takes the standard catalyst to heat up or "light off" and start working after the car is started. Engelhard has developed a way of trapping 50 percent of the hydrocarbons during the light-off period during testing using the Federal Test Procedure. The hydrocarbon trap works by trapping pollution in an absorbent bed. When the catalytic converter starts working, the pollution is released through it and is destroyed, leaving the trap clean and ready for the next time the engine is started. Engelhard is planning to begin working with auto manufacturers to apply the technology to specific engine designs. (Air Quality Week, 6/15/92)

Index Number: 296
Unique ID: 000212
Main Category: MOBILE SOURCES
Projects Type(s): filters/traps
catalytic converters
diesel technology
particulates
Location(s): , , U.S.A.
Companies: Donaldson Corporation
Date: 04/23/92

Donaldson Corporation manufactures detailed diesel particulate control systems such as particulate trap oxidizers, catalytic converter mufflers, and replaceable/cleanable filters. A trap system consists of a filter to capture particulate emitted, a regeneration mechanism to burn off or clean the particulate periodically, and a mechanism for sensing when regeneration should occur. Among filtration methods, the wall-flow monolith is popular as a ceramic device in which the particulate flow through porous walls and are collected. Filter regeneration systems include electrical heating, the use of

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diesel fuel burners, catalysts, throttling, or combinations of these. Donaldson has about 550 ceramic wall-flow monolith trap with electrical regeneration systems in use. These trap systems can be installed on new vehicles or retrofitted on vehicles with conventional diesel technology. The company is also testing a multiple cartridge approach that fits easily into an engine compartment with limited space. Another type of after-treatment, the catalytic converter muffler, integrates emissions and noise control. Particulate trap systems are commercially available now, improving in reliability, cost effective, and reportedly effective in achieving clean diesel performance. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 297
Unique ID: 000225
Main Category: MOBILE SOURCES
Projects Type(s): flexible fuel vehicles
 natural gas vehicle (NGV)
 variable fuel vehicles
 methanol
Location(s): , CA, 09 U.S.A.
Companies: Ford Motor Co.
Date: 01/01/93

Ford will produce a demonstration fleet of 100 CNG pickup trucks later this year to be used by a number of natural gas utilities. Also, 2,500 flexible fuel Tauruses and at least 200 variable fuel Econoline vans are scheduled to be produced later this year and into 1993 for the California market. (Chemical Marketing Reporter, 2/17/92, p. SR16) Ford Motor Co. will produce 2,800 1993 Taurus Flexible Fuel Vehicles that will run on any combination of methanol (up to 85%) and unlead gasoline. Ford also reportedly plans to place 40 natural gas Crown Victoria passenger cars into service with utility companies. Other Ford programs include 50 to 100 CNG-powered F-series pickup trucks and Econoline vans with an additional 200 to 600 CNGs planned for 1993. In 1993, Ford plans to build 70 to 100 electric vehicles. (Beverage Industry, 11/92, p. 33) Ford Motor Company has introduced a production alternative fuel vehicle for sale. The Taurus FFV (flexible fuel vehicle) can run on M85 methanol fuel, pure gasoline, or any combination of the two. A fuel sensor is used to detect the percentage of methanol in the fuel, signaling the engine control computer to adjust the mixture and spark timing to appropriate settings. (Aftermarket Business, 1/1/93, p. 19)

Index Number: 298
Unique ID: 000228
Main Category: MOBILE SOURCES
Projects Type(s): flexible fuel vehicles

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Location(s): , CA, 09 U.S.A.
Companies: Mercedes-Benz
California Energy Commission
Date: 01/16/92

Mercedes-Benz of North America plans to deliver six flexible-fuel 300SE models to the California Energy Commission this year and plans to produce 9,000 of these cars for sale in California in 1994. (Automotive News, 1/16/92, p. 1)

Index Number: 299
Unique ID: 000376
Main Category: MOBILE SOURCES
Projects Type(s): flexible fuel vehicles
Location(s): Los Angeles, CA, 09 U.S.A.
Companies: Southern California Rapid Transit District (SCRTD)
Northrop Corp.
TRW
General Motors' Hughes Aircraft
Lockheed Aircraft
Date: 10/02/92

The Southern California Rapid Transit District (SCRTD) reportedly will be awarded a Phase I grant of \$4 million by DOT-Federal Transit Authority for a new Advanced Technology Transit Bus (ATTB) program in Los Angeles. DOT-FTA reports that this grant is the first of several planned for major transit districts around the U.S. Northrop Corp., TRW, Hughes Aircraft and Lockheed are said to be in discussions with SCRTD for possible bids on this joint effort to develop safer, cleaner, fuel-efficient buses using super-strong composite materials and other aerospace technologies. Total cost of the project as currently proposed is targeted at \$27.2 million, with 80% to be paid by the Federal government and the rest by the Regional Transit District. SCRTD plans to produce five or six working prototypes for testing around the country. The composite materials based ATTB is expected to weigh about 10,000 lbs less than conventional buses. Lighter weight should allow use of a smaller engine which would produce lower emissions. The ATTB also could be powered by an electric motor and fuel cells or other alternative fuels. (Composites Industrial Monthly, 10/2/92, p. 1)

Index Number: 300
Unique ID: 000196
Main Category: MOBILE SOURCES
Projects Type(s): inspection/maintenance
Location(s): Hammond, IN, 05 U.S.A.
Phoenix, AZ, 09 U.S.A.
Companies: Environmental Protection Agency

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Date: 06/29/92

EPA is testing an auto inspection technology know as the "IM-240" test in Hammond, IN and Phoenix, AZ. This technology compresses the first portion of the urban dynamometer driving cycle into four minutes and is getting excellent results. One of the conveniences of the IM-240 test is that it is not necessarily a fixed-length test, so that the test can stop whenever enough data has been collected. Also, if the car should fail, the tester allows the test to continue running a full four minutes, to obtain as much data as possible. (Tire Business, 6/29/92, p. 6)

Index Number: 301
Unique ID: 000213
Main Category: MOBILE SOURCES
Projects Type(s): inspection/maintenance
CFCs, HFCs, HCFCs
Location(s): Crystal Lake, IL, 05 U.S.A.
Companies: Sun Electric
Date: 04/23/92

Sun Electric, Crystal Lake, IL, produces diagnostic and enhanced I/M equipment including a line of mobile recovery systems for reducing CFCs emissions, a hand-held scanner that gathers diagnostic messages from the vehicle and displays them, a PC-based shop management system (Shopmax), and safety and inspection system equipment such as front-end aligners. Sun's MCA 3000 is a PC-based analyzer that performs "four gas analysis" and is capable of supplying the mechanic with technical service bulletins. Sun's MGA 9000 bar exhaust gas analyzer is a 286/386 based system with sufficiently large memory for data management and can communicate with other computers. Additional technology options available for the MGA 9000 include a barcode reader, vehicle on-board computer interface, advanced diagnostic software, PC option to retrieve technical service bulletins, CD-ROM mass storage unit of 500 megs, on-line communications by modem (currently used in Florida to register information with the state), and the capability to incorporate a NOx analyzer, opacity test, and dynamometer. Another technology option is the POD which, if connected between the Sun analyzer and the cable to the vehicle's on-board computer, obtains real-time data and additional maintenance data. Future options to be offered by Sun include evaporative pressure and canister purge tests. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 302
Unique ID: 000216
Main Category: MOBILE SOURCES
Projects Type(s): inspection/maintenance

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Location(s): , ,
Companies: Airco Gases
Date: 04/06/92

Airco Gases has launched a new line of automotive inspection/maintenance (I/M) gases, designed to help states in their expanding efforts to monitor tailpipe emissions from automobiles. The gases are mixtures containing carbon monoxide, carbon dioxide, and propane or nitric oxide in nitrogen. The I/M mixtures monitor the accuracy of equipment used to test those emissions. (Chemical Marketing Reporter, 4/06/92, p. 21)

Index Number: 303
Unique ID: 000209
Main Category: MOBILE SOURCES
Projects Type(s): IVHS
Location(s): , ,
Companies:
Date: 04/23/92

Originally conceived of to alleviate traffic congestion, the Intelligent Vehicle Highway System (IVHS) is a broad-based concept of controlling road traffic in much the same way that air traffic and harbor traffic are controlled. It involves technologies that can be grouped into three main functional areas: Advanced Traffic Management System (ATMS) that is responsible for obtaining real-time information; Advanced Traveller Information System (ATIS) through which information will be disseminated, either in vehicles or on a kiosk; and Advanced Vehicle Control System (AVCS) which incorporates the idea of intelligent cruise control by which future cars may be able to sense that they are too close to the car in front and respond by automatically slowing down. IVHS may also be applied to develop "smart buses" that would provide a way of providing location information to people at stops or feature a farebox or "smart card" reader to count passengers. Carpooling could be made more efficient by IVHS and a computer system that could configure a "dynamic carpool" providing drivers with a daily schedule of people to pick up. Currently 30 field tests are being conducted for these technologies. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 304
Unique ID: 000210
Main Category: MOBILE SOURCES
Projects Type(s): IVHS
Location(s): , NY, 02 U.S.A.
 , NJ, 02 U.S.A.
 , TX, 06 U.S.A.

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, LA, 06 U.S.A.
, OK, 06 U.S.A.

Companies:

Date: 04/23/92

To deal more quickly with problems causing traffic delays, the states of New York and New Jersey created Transcom to act as a hub for information as part of its IVHS for the metropolitan area. It collects and relays real-time information to all other transportation agencies, including rail lines, subways, and bus drivers, because traffic and transit system incidents have spill-over effects on other routes. Another technology that will help is electronic toll collection (ETC), which already exists in Dallas, Louisiana, and Oklahoma. ETC for the New York region will probably take the form of an electronic tag on a car which will record the amount of the toll as the car passes through the toll reader. The driver will receive a bill for the total number of tolls at the end of each month. The technology may reduce CO and hydrocarbon emissions significantly even if only a quarter of cars have it. Another possible application of ETC would be to use tagged vehicles to monitor traffic flow and signal an operations center regarding any problems. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 305
Unique ID: 000222
Main Category: MOBILE SOURCES
Projects Type(s): methanol
variable fuel vehicles
ethanol
Location(s): , CA, 09 U.S.A.
, WI, 05 U.S.A.
, IL, 05 U.S.A.
, TX, 06 U.S.A.
Companies: General Motors Corporation
Date: 02/27/92

GM offered 4000 cars designed to run on 85 percent methanol, known as M85, to the general public in California late last year and has already agreed to build another 2000 of the variable fuel vehicles for delivery this April or May. In addition, GM is planning to sell 1000 CNG pickup trucks to utilities in Texas and California and 50 variable fuel cars that use corn-based ethanol or gasoline in a test program in Wisconsin and Illinois. (Chemical Marketing Reporter, 2/27/92, p. SR16)

Index Number: 306
Unique ID: 000224
Main Category: MOBILE SOURCES

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Projects Type(s): methanol
 ethanol
 natural gas
Location(s): , CA, 09 U.S.A.
Companies: Detroit Diesel Corporation (DDC)
 California Air Resources Board (CARB)
 Southern California Rapid Transit District (SCRTD)
 Penske Corporation
 General Motors Corporation
Date: 02/17/92

Detroit Diesel, a maker of bus and truck diesel engines, has received Federal Environmental Protection Agency and California Air Resources Board certification for a 100 percent methanol-fueled engine. A major order from the Southern California Rapid Transit District is pending. Detroit Diesel is 80 percent, owned by Penske Corporation and 20 percent owned by GM. The company also has an M85 engine (an engine that runs on a mixture of 85 percent methanol and 15 percent unleaded gasoline) and is researching engines fired by ethanol and both compressed and liquefied natural gas. (Chemical Marketing Reporter, 2/17/92, p. SR16)

Index Number: 307
Unique ID: 000367
Main Category: MOBILE SOURCES
Projects Type(s): methanol
 NOx controls
Location(s): Los Angeles, CA, 09 U.S.A.
 Rosewell, NM, 06 U.S.A.
Companies: Transportation Manufacturing Co.
Date: 10/29/92

The first 37 of an anticipated 303 new methanol-powered buses began service in October 1992, in Los Angeles. The 40-foot buses seat 43 passengers and two wheelchairs, cost \$238,500 each and are made by the Transportation Manufacturing Co. of Rosewell, NM. The methanol fuel reportedly cuts NOx emissions by 65%. Methanol buses will make up 15% of the Regional Transit District 2,200 bus fleet. (Urban Transport News, 10/29/92, V. 20, No. 22)

Index Number: 308
Unique ID: 000375
Main Category: MOBILE SOURCES
Projects Type(s): methanol
Location(s): Los Angeles, CA, 09 U.S.A.
Companies: Hewlett Packard
Date: 11/30/92

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Hewlett Packard is using 100 methanol-powered cars in its Los Angeles sales force. (Crain's Chicago Business, 11/30/92, p. 3)

Index Number: 309
Unique ID: 000211
Main Category: MOBILE SOURCES
Projects Type(s): natural gas
combustion technology
catalytic converters
filters/traps
Location(s): , , U.S.A.
Companies: Cummins Engine, Inc.
Date: 04/23/92

To meet new emissions standards which go into effect in 1994, engine manufacturers will have to offer after-treatment devices and adapt their products to alternative fuels such as natural gas or methanol. Cummins Engine, Inc. has introduced a 10-liter natural gas engine for the transit industry in 1991. Major engine modifications expected to appear in response to tougher emissions standards include turbo charger technology improvements for air handling systems; increased use of ceramics in high temperature areas, and ways to decrease the amount of lubrication oil used; electronic components will be used to control NOx emissions; and combustion chamber design will likely be modified to change the shape of the piston for better mixing of fuel and air and more efficient lubrication. Catalytic converters, already a proven technology for emissions reductions, are being designed to be as unobtrusive as possible, fitting conveniently inside the exhaust system. Another technology in development is the ceramic particulate trap, an after-treatment device that collects particulate from the exhaust stream and, through an oxidation process, burns them off. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 310
Unique ID: 000218
Main Category: MOBILE SOURCES
Projects Type(s): natural gas
ethanol
Location(s): Topeka, KS, 07 U.S.A.
Companies: Amoco Oil Company
KPL Gas Service Company
Date: 03/01/92

Amoco Oil Company recently opened a compressed natural gas (CNG) fuel station in Topeka, Kansas. Governor Finney's van can be fueled by CNG and a portion

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of the state fleet will be converted so that it can be fueled by CNG or low ethanol gas. The filling station is a joint venture of Amoco Oil Company and KPL Gas Service Company. Bids were let for the conversion of vans. (Worldwide Energy, 3/92)

Index Number: 311
Unique ID: 000204
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
catalysts
Location(s): , , U.S.A.
Companies: Chrysler Corporation
Gas Research Institute (GRI)
Date: 04/30/92

Chrysler Corporation and the Gas Research Institute have initiated a project to build full-size natural gas powered vans to confirm the technical and commercial feasibility for the 1994 model year. The project will focus on the development of a Chrysler 5.2-liter V-8 engine optimized for operation on compressed natural gas. In addition, specially formulated catalysts will be used in the natural gas powered Dodge in order to meet the California Air Resource Board 1994 Low Emitting Vehicle (LEV) standards. (Chrysler Corporation, 4/30/91)

Index Number: 312
Unique ID: 000219
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): Tulsa, OK, 06 U.S.A.
Topeka, KS, 07 U.S.A.
Companies:
Date: 03/01/92

The Tulsa, OK, school district has converted 105 school buses to CNG and each bus is saving the school district about \$1000 per year in fuel costs. One of the buses was sent to be refueled at the grand opening of the CNG station in Topeka, KS. (Worldwide Energy, 3/92)

Index Number: 313
Unique ID: 000223
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
flexible fuel vehicles
Location(s): Washington, DC, 03 U.S.A.

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Companies: General Services Administration
Chrysler Corporation
Date: 02/17/92

The General Services Administration in Washington, DC, has ordered 50 vans powered by compressed natural gas (CNG) from Chrysler and has agreed to increase its order of flexible fuel vehicles, or FFVs, to 2,500 from the 100 it originally agreed to purchase. (Chemical Marketing Reporter, 2/17/92, p. SR16)

Index Number: 314
Unique ID: 000229
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): , CA, 09 U.S.A.
Companies: Pacific Gas and Electric Company
California Energy Commission
Date: 10/01/91

The California commission has authorized Pacific Gas and Electric Co. to develop a ratepayer-funded program to achieve substantial market penetration of vehicles fueled by compressed natural gas. (Public Utilities Fortnightly, 10/1/91, pp. 32-34)

Index Number: 315
Unique ID: 000230
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): Wilmington, DE, 03 U.S.A.
Companies: Columbia Gas System Service
Central Ohio Transit Authority
Date: 06/01/92

Columbia Gas System Service (Wilmington, DE) has cooperated in the development of a transit bus that runs entirely on natural gas. The bus has been in testing for several months by the Central Ohio Transit Authority and recently made a trip to Wilmington, DE, for a debut for utility, environmental, and transit officials. Columbia Gas put some \$300,000 into the development of the bus, which can carry 65 passengers, go 800 miles without refueling, and get some 4 miles per gallon, as do diesel buses. Compressed natural gas, at 3,600 lb/in of pressure, is stored in 6 tanks to fuel the bus. The natural gas-powered bus market is expected to grow over the next 5 years as urban pollution control measures get stricter under the Federal Clean Air Act. Columbia Gas expects a return on bus development costs in 5 years. (Morning News (Wilmington, DE) 6/01/91, pp. E1, E3)

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Index Number: 316
Unique ID: 000284
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): Albuquerque, NM, 06 U.S.A.
Sante Fe, NM, 06 U.S.A.
Companies: MESA
Date: 11/16/92

MESA will offer its natural gas vehicle conversion program to public and private fleet operators in Albuquerque and Santa Fe, NM, marking the ninth and tenth U.S. cities to which MESA has extended its conversion offer. MESA will convert fleet vehicles and install fueling facilities in exchange for fuel supply contracts under which CNG is sold at or below the price the fleet operator would pay for gasoline. (Oil and Gas Journal, November 16, 1992, p. 38)

Index Number: 317
Unique ID: 000285
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): Pittsburgh, PA, 03 U.S.A.
Companies: Consolidated Natural Gas Co.
General Motors Corporation
Ford Motor Co.
Chrysler Corporation
Date: 10/05/92

Consolidated Natural Gas Co., Pittsburgh, reported that the big three automakers have built approximately 3,000 dedicated CNG vehicles to date. Consolidated has added 17 General Motors Sierra pickups, four Ford Motor Co. Crown Victoria passenger cars, and a Chrysler Corp. full size van, all designed to run on compressed natural gas, to its fleet of approximately 1,100 CNG vehicles. (Oil and Gas Journal, October 5, 1992, p. 38)

Index Number: 318
Unique ID: 000286
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
natural gas
Location(s): , CA, 09 U.S.A.
Companies: Southern California Gas Co.
General Motors Corporation

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Date: 10/05/92

In Sept. 1992, Southern California Gas Co. employees began driving 50 of the first American made dedicated CNG vehicles. The utility bought 130 GM Sierra CNG trucks and will add 100 more in 1993. SoCalGas plans to install three CNG refueling stations per month for the next 1- years. (Oil and Gas Journal, October 5, 1992, p. 38)

Index Number: 319
Unique ID: 000287
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): , ,
Companies: General Motors Corporation
Date: 10/05/92

General Motors Corp. will reportedly build 2,500 compressed natural gas Sierra trucks in 1992. (Oil and Gas Journal, October 5, 1992, p. 38)

Index Number: 320
Unique ID: 000288
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
natural gas
Location(s): Oklahoma City, OK, 06 U.S.A.
Tulsa, OK, 06 U.S.A.
Las Vegas, NV, 09 U.S.A.
Phoenix, AZ, 09 U.S.A.
Companies: MESA
Southwest Gas
Date: 10/05/92

MESA, in its MESA Environmental-Clean Fleet program, offered to finance conversion to CNG of about 215,000 fleet vehicles in Oklahoma City and Tulsa and as many as 125,000 fleet vehicles in Clark County, NV, including Las Vegas. MESA plans to earn a profit through fuel supply agreements that call for fleet operators to purchase natural gas from MESA at or below prevailing gasoline prices. MESA and Southwest Gas have apparently completed negotiations for a pipeline tariff and supply agreement for CNG fueling sites in Phoenix. (Oil and Gas Journal, October 5, 1992, pp. 38-40)

Index Number: 321
Unique ID: 000290
Main Category: MOBILE SOURCES

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Projects Type(s): natural gas vehicle (NGV)
Location(s): , , U.S.A.
Companies: California Air Resources Board (CARB)
Cummins Engine, Inc.
Date: 09/17/92

In early September, 1992, the California Air Resources Board announced the certification of a natural gas engine, produced by Cummins Engine Company, that meets CARB air quality emissions standards. (Clean Air Network Online Today, September 17, 1992, p. 1)

Index Number: 322
Unique ID: 000368
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
methanol
Location(s): New York, NY, 02 U.S.A.
Companies: Command Bus Company
Triboro Coach Corp.
Date: 11/08/92

By the end of fiscal year 1993, New York City will lease 55 new CNG-powered buses to two private bus companies: Brooklyn-based Command Bus Co. and Triboro Coach Corp. of Jackson Heights, Queens. Triboro will also lease 18 new methanol-fueled buses, tripling the number it now operates. (Crain's New York Business, 11/8/92 p. 57)

Index Number: 323
Unique ID: 000369
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): New York, NY, 02 U.S.A.
Companies:
Date: 11/08/92

A pilot program was launched in October 1992, for six CNG- medallion taxicabs in New York City. At least 50 more, from several taxi companies, reportedly will be converted to natural gas by 1994. (Crain's New York Business, 11/8/92 p. 57)

Index Number: 324
Unique ID: 000370
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)

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methanol
diesel technology
Location(s): , CA, 09 U.S.A.
Companies: Navistar International Transportation Corp.
Date: 11/01/92

Navistar International reportedly plans to develop a CNG engine for medium and school bus applications. They are also evaluating a DT-466 methanol-powered dump truck operating in California and a natural gas/diesel fuel system for a DT-360 engine. The system uses diesel fuel to start the engine and operates on 100% CNG with a small amount of diesel. (Beverage Industry, 11/92, p. 33)

Index Number: 325
Unique ID: 000371
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): Pontiac, MI, 05 U.S.A.
Troy, MI, 05 U.S.A.
Companies: General Motors Corporation
PAS Incorporated
Date: 11/01/92

GMC Truck Divisions claims its NGV natural gas powered truck should offer a substantial savings compared to similar gasoline vehicles because of the relatively lower price of natural gas. Initially, GMC will produce 2,000 full-size Sierra pickups. They reportedly will be built along with gasoline-powered vehicles in Pontiac, MI, then shipped to PAS Inc., a Troy, MI, specialty vehicle engineering and manufacturing firm for installation of the natural gas fuel system. Payload of the NGV is 3,000 lbs, and the targeted range between refuels is about 200 miles. Fuel economy is estimated to be between 15 and 19 miles per equivalent gallon of gasoline. (Beverage Industry, 11/92, p. 33)

Index Number: 326
Unique ID: 000373
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
catalytic converters
Location(s): , , U.S.A.
Companies: Cummins Engine, Inc.
Date: 11/01/92

Cummins Engine Co. offers an L-10 six cylinder 10-liter LNG or CNG engine that is similar to its diesel model. It uses spark ignitions, a conventional gas regulator and mixer, a 10.5:1 compression ration and lean burn technology.

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The engine also has an oxidation catalyst to meet diesel hydrocarbon emissions. (Beverage Industry, 11/92, p. 33)

Index Number: 327
Unique ID: 000374
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): , , U.S.A.
Companies: Cummins Engine, Inc.
Date: 11/01/92

Cummins Engine Co. is reportedly developing a 183 horsepower B5.9 engine and a 240 horsepower C8.3 engine, both of which will run on CNG and will be tested in refuse haulers. (Beverage Industry, 11/92, p. 33)

Index Number: 328
Unique ID: 000409
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): , KY, 04 USA
Companies: Titan Turf Equipment
Date: / /

Titan Turf Equipment Inc. (Kentucky) has developed a natural gas-powered commercial lawnmower. The company converted a 23-horsepower Kohler engine on a 60-inch front deck mower, mounting a tank behind the seat to hold four hours worth of compressed natural gas. The tank can also be converted to run on gasoline, if it runs out of natural gas. The mower reportedly exceeds CARB emissions standards, and costs less to operate because of lower fuel and maintenance costs. Titan reportedly plans to begin full-scale production of converted mowers sometime in 1994. (Natural Resource, V. 6, No. 1, p. 8)

Index Number: 329
Unique ID: 000410
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): , CA, 09 USA
Chicago, IL, 05 USA
 , , Canada
Companies: Southern California Gas Co.
Ford Motor Co.
Gas Research Institute (GRI)
Date: 02/06/93

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Southern California Gas (SoCalGas), the Chicago-based Gas Research Institute (GRI), and Ford are reportedly investing \$50 million to produce cars that run solely on natural gas. Another \$23 million is being spent on a similar program for vans and pick-up trucks. A fleet of fifty adapted Ford Crown Victoria-model cars are to undergo a three year evaluation in the U.S. and Canada. Several other utilities will also monitor the vehicles' operating costs, reliability and other data. (Financial Times, 2/6/93, p.2)

Index Number: 330
Unique ID: 000419
Main Category: MOBILE SOURCES
Projects Type(s): natural gas vehicle (NGV)
Location(s): , TX, 06 USA
Companies: Fermata
Date: 02/04/93

Fermata, will reportedly be the only for-hire Texas trucking service using alternative fuel. By late this month natural gas-fueled trucks will be on the road. Fermata has received authority from the Texas Railroad Commission to carry small parcels throughout Texas using only alternative fuels. Other companies are operating with intrastate authority in the same market; for example, UPS is operating 15 natural gas trucks in a Dallas trial. Fermata expects maintenance and engine wear on trucks will be far less running on natural gas. Companies who must comply with the Clean Air Act regulations by reducing air pollutants will get credits if they hire these trucks and will be saved from trying to convert their own. Fermata plans to convert 200 trucks five at a time to use natural gas. Travel will reportedly pay off the costs in about a year because natural gas costs half of an equivalent amount of gasoline. (Alternative Energy Network Online Today 2/4/93)

Index Number: 331
Unique ID: 000391
Main Category: MOBILE SOURCES
Projects Type(s): NOx controls
variable fuel vehicles
diesel technology
Location(s): , ,
Companies: Fairbanks Morse Engine
Coltec Industries
Date: 09/01/92

Fairbanks Morse Engine division of Coltec Industries Inc. introduced a dual fuel engine that produces 80 percent less NOx than other engines for power generation applications. The Enviro-Design engine reportedly emits one gram of NOx per horsepower hour compared to the five grams/horsepower hour emitted

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by previous engine designs. The lower NOx levels are achieved by reducing the amount of diesel oil needed to ignite the natural gas burned in the engine. The new engine burns 99 percent natural gas and one percent diesel. A new fuel injection system configuration makes this possible. In addition to lowering pollution levels, the new engine is also reported to have higher thermal efficiency and higher horsepower than previous dual fuel engines marketed by Fairbanks. The company expects to complete production by mid-1993 of an 18-cylinder engine that will be used at a municipal electric power generation facility. (AirTECH, 9/92, p. 122)

Index Number: 332
Unique ID: 000226
Main Category: MOBILE SOURCES
Projects Type(s): propane
Location(s): , , U.S.A.
Companies: Ford Motor Co.
Date: 02/17/92

Ford is redesigning its 7-liter light truck engines developed a decade ago that run on liquid propane gas. The new 4.9-liter versions are due out this summer. Ford also offers factory conversions to propane engines. (Chemical Marketing Reporter, 2/17/92, p. SR16)

Index Number: 333
Unique ID: 000292
Main Category: MOBILE SOURCES
Projects Type(s): reformulated gasoline
Location(s): Lewisburg, WV, 03 U.S.A.
Companies: ABB Process Analytics
Date: 11/30/92

The Vista Model 4100 analyzer from ABB Process Analytics, of Lewisburg, WV, that is reportedly a new on-line instrument for accurately measuring Reid vapor pressure through the gasoline range of 0-20 psia. The instrument consists of a controller, analyzer, and sample system. The analyzer incorporates a single measuring cell with a pressure transducer. Three solenoid valves control the filling and emptying of the cell. The instrument performs self-diagnostics for analysis results. The new model's precise measurement capabilities allows effective control of blended gasoline volatility, optimization of blending processes, and significant reductions in blending costs, according to ABB Process Analytics. (Oil and Gas Journal, November 30, 1992, p. 65)

Index Number: 334

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Unique ID: 000293
Main Category: MOBILE SOURCES
Projects Type(s): vapor recovery
Location(s): Houston, TX, 06 U.S.A.
Companies: Conoco
Date: 10/26/92

Conoco Inc. demonstrated the first operation Stage II vapor recovery system in Houston, TX, Oct. 22, 1992. Stage II systems are designed to eliminate 95% of hydrocarbon emissions during vehicle fueling. Stage II system are required at service stations in urban ozone nonattainment areas beginning in May, 1993. (Oil and Gas Journal, October 26, 1992, p. 40)

Index Number: 335
Unique ID: 000303
Main Category: STATIONARY SOURCES
Projects Type(s): catalysts
NOx controls
Location(s): , , U.S.A.
Companies: Norton Chemical Process Products Corporation
Date: 11/02/92

Norton Chemical Process Products Corp. is offering what is reportedly a new, high performance, catalyst line. The company's NC-300(R) zeolite catalyst line features a 200-cells/sq.inch, homogeneously extruded honeycomb monolith designed for selective catalytic reductions systems that maximum control of NOx emissions. The homogeneous zeolite composition ensures reliability at high temperatures without loss of catalytic material. The catalyst reportedly reduces NOx emissions over a wide range of temperatures with a very low level of ammonia slip. (Oil and Gas Journal, November 2, 1992, p. 46)

Index Number: 336
Unique ID: 000240
Main Category: STATIONARY SOURCES
Projects Type(s): catalytic technology
ESPs
SO2 controls
particulates
Location(s): Catlettsburg, KY, 04 U.S.A.
Companies: Ashland Petroleum Co.
Date: 08/31/92

Ashland Petroleum Co., expects to invest nearly \$1 billion throughout the 1990s on refinery projects to produce cleaner burning fuels and reduce emissions. The company has started up a \$13 million pollution control system

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at its 213,400 b/cd Catlettsburg, KY, plant and is constructing two major processing units to allow the plant to produce cleaner fuels. Ashland installed two electrostatic precipitators on the flue gas boiler stack of the refinery's fluid catalytic cracking unit to reduce particulate emissions from existing pollution control equipment. The new pollution control system uses electrically charged plates that capture particulates from FCC process gases before reaching the unit's stack. The 57,000 b/cd FCC unit converts gas oil from the crude distillation unit into gasoline blending stocks and fuel oils. In addition, Ashland is constructing a \$68 million distillate desulfurizer and work has started on a \$66 million continuous catalyst regenerator (CCR). The 40,000 b/d desulfurizer will provide additional hydrotreating capacity for producing low sulfur diesel fuel. (Oil and Gas Journal, 8/31/92, p. 20)

Index Number: 337
Unique ID: 000301
Main Category: STATIONARY SOURCES
Projects Type(s): catalytic technology
SO2 controls
Location(s): Chiba, , Japan
Companies: Kyokuto Petroleum Industries Ltd.
Mobil Corporation
M.W. Kellogg
Toyo Engineering Corp.
Tonen Technology KK
Date: 11/02/92

Kyokuto Petroleum Industries Ltd. began work on a \$270 million upgrade of its 125,000 b/d Chiba, Japan, joint venture refinery that includes a 20,000 b/d residual fluid catalytic cracker (RFCC) and a 35,000 b/d gas oil desulfurization unit. The proprietary fluid catalytic cracking technology for the RFCC unit was developed by Mobil Corp. and M.W. Kellogg Co. Toyo Engineering Corp. will be contractor for the RFCC unit, to be completed by spring 1995, and Tonen Technology KK is building the desulfurization unit, scheduled to be completed by spring 1994. Kyokuto is a joint venture of Mobil Corp. and Mitsui Group. (Oil and Gas Journal, September 28, 1992, p. 46 and November 2, 1992, p. 43)

Index Number: 338
Unique ID: 000302
Main Category: STATIONARY SOURCES
Projects Type(s): catalytic technology
scrubbers
vapor recovery
liquefied petroleum gas
Location(s): Yokohama, , Japan

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Companies: Nippon Petroleum Refining Company
Stone & Webster
Date: 11/02/92

Nippon Petroleum Refining Co. started up a 30,000 b/d gas oil and resid catalytic cracking unit at its Negishi refinery in Yokohama. The unit processes atmospheric resids and vacuum gas oils to produce high octane gasoline, light oil, and liquefied petroleum gas. The Stone & Webster designed unit includes a flue gas clean-up system and gas recovery plant. (Oil and Gas Journal, November 2, 1992, p. 43)

Index Number: 339
Unique ID: 000246
Main Category: STATIONARY SOURCES
Projects Type(s): COx controls
NOx controls
Location(s): , , U.S.A.
Companies: W.R. Grace & Company
Date: 04/23/92

W.R. Grace & Co. has developed the CAMET system that removes CO and/or NOx for cogeneration, fire heaters, and other clean fuel applications. These systems can be customized and are frequently designed for dual pollutant removal with a removal efficiency of greater than 99 percent for CO and up to 90 percent for NOx. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 340
Unique ID: 000305
Main Category: STATIONARY SOURCES
Projects Type(s): COx controls
hydrogen
methane
Location(s): , , U.S.A.
Companies: North Star Steel Company
Cleveland-Cliffs Inc.
Date: 09/21/92

North Star Steel Co. is reportedly close to making a decision on commercialization of an iron carbide process in conjunction with Cleveland-Cliffs Inc. The process has the potential to cut carbon dioxide emissions in half from current steel mini-mill levels. The technology uses primarily hydrogen and methane gases, with water as the principal product of the reaction. Energy consumption is comparable to that of established

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direct-reduced iron processes. (American Metal Market, September 21, 1992, p. 15A)

Index Number: 341
Unique ID: 000251
Main Category: STATIONARY SOURCES
Projects Type(s): emissions credits/trade
Location(s): Houston, TX, 06 U.S.A.
Companies: National Offsets
Texas Air Control Board (TACB)
Houston Chamber of Commerce
Date: 02/09/92

Carl Russell and Brian Anderson have become partners in National Offsets, a company that brokers pollution emission credits. They are gearing up for the new market of air pollution credits that is expected to develop in Houston over the next year or so. The trading of emission credits should get rolling in Texas later this year and in 1993 as the Texas Air Control Board issues regulations to comply with the 1990 Clean Air Act Amendments. A subcommittee of the Houston Chamber of Commerce is studying the possible creation of an emissions bank. (Houston Post, 2/9/92)

Index Number: 342
Unique ID: 000247
Main Category: STATIONARY SOURCES
Projects Type(s): emissions monitoring
emissions credits/trade
Location(s): , , U.S.A.
Companies:
Date: 04/23/92

Continuous Emissions Monitoring Systems (CEMS) are expected to play an important role in facilitating a reliable market-based emissions trading system. CEMS serve four primary functions in a market-based system: (1) provide the "gold standard" for measuring the success of emissions control, thereby allowing a company to maximize the value of its plant and equipment as well as improve its credibility; (2) expand the applicability of market-based incentives; (3) provide "added value" to traditionally non-productive emissions control systems as companies seek to buy the most productive, rather than the cheapest, system and as integration of CEMS maximizes the production process and extends process equipment life; and (4) force technology development by propelling market-based strategies, helping to verify the accuracy of emissions equipment, and enhancing the return on investments in emissions control equipment by making companies aware of their position in

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trading. (Summary of Proceedings, The Clean Air Marketplace Conference,
4/22/92 - 4/23/92)

Index Number: 343
Unique ID: 000300
Main Category: STATIONARY SOURCES
Projects Type(s): emissions monitoring
VOCs
Location(s): Alpharetta, GA, 04 U.S.A.
Companies: Siemens Industrial Automation
Date: 11/16/92

The measurement process of Siemens Industrial Automation (Alpharetta, GA)'s Fidamat 5E analyzers reportedly offers uninterrupted and consistent hydrocarbon measurements in air. The 5E-I model measures total hydrocarbon content in air and gases with an oxygen content of 17-25%. The 5E-K model measures hydrocarbon levels in gases with less than 7 or more than 25 percent oxygen. It also provides readings of hydrocarbons in steam and waste gases. The flame ionization process uses a built-in diaphragm pump to feed the sample gas to the detector. The sample is combined with ultrapure hydrogen and combustion air before being burned. Organically bonded carbons are ionized when the mixture is burned and measured for a content reading. (Oil and Gas Journal, November 16, 1992, p. 60)

Index Number: 344
Unique ID: 000380
Main Category: STATIONARY SOURCES
Projects Type(s): emissions monitoring
Location(s): Glendale, CA, 09 U.S.A.
Madrid, , Spain
Companies: Pollution Research and Control Corp.
Date: 11/20/92

Pollution Research and Control Corp., of Glendale, CA, won a contract worth about \$350,000 to install air pollution monitoring systems in Madrid, Spain. The firm designs, produces and markets pollution measuring instruments. (Air Toxics Report, V. 5, No. 11, 11/20/92)

Index Number: 345
Unique ID: 000381
Main Category: STATIONARY SOURCES
Projects Type(s): emissions monitoring
Location(s): Austin, TX, 06 U.S.A.
Companies: Radian Corporation

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Exxon Company
Date: 11/12/92

Continuous emission monitoring (CEM) systems are reportedly the most likely choice for chemical manufacturing facilities to monitor ambient air emissions. A CEM system produced by Radian of Austin, TX, based on Fourier transform infrared spectroscopy (FIR), can simultaneously monitor minuscule amounts of a broad range of compounds, and will be installed at an Exxon plant in Texas. (Clean Air Online Network Today, 11/12/92, p. 1)

Index Number: 346
Unique ID: 000415
Main Category: STATIONARY SOURCES
Projects Type(s): emissions monitoring
COx controls
NOx controls
SO2 controls
Location(s): , ,
Companies: Scott Specialty Gases
Date: 01/18/93

Scott Specialty Gases has reportedly developed a new grade of air for continuous emissions monitors that can limit emissions to "very low levels." Scott's CEM Zero/Dilution Air exceeds EPA's impurity specifications for CEMs at electricity generation facilities. It limits concentration of SO2 and CO2 to 0.1 parts per million. Concentrations of CO are limited to 0.5 ppm, and NOx, water and other hydrocarbons are kept "very low." (Coal & Synfuels Technology 1/18/93 v. 14, No. 2)

Index Number: 347
Unique ID: 000248
Main Category: STATIONARY SOURCES
Projects Type(s): methanol
NOx controls
Location(s): , , U.S.A.
Companies: EPA Air and Energy Engineering Research Laboratory
(AEERL)
Date: 04/23/92

The Hydrocarb process, which is currently being evaluated as a source of methanol as an alternative fuel, has a by-product that has potential for use as a premium pollution-free boiler fuel in the utility and industrial sectors. The by-product is pure carbon-black (CB), which contains no sulfur, nitrogen, or particulates and has a significant heating value. EPA's Air and Energy Engineering Research Laboratory (AEERL) ran a brief series of tests to

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determine pumpability, atomization, and combustion characteristics of slurries made from pure CB. Results from these tests indicate that CB slurries have high carbon burnout efficiencies for a wide range of furnace excess air levels. In addition, NO emissions resulting from the combustion of these slurries would probably be lower than those from pure oil burning. (EPA ORD Engineering Highlights, 4/92, p.1)

Index Number: 348
Unique ID: 000304
Main Category: STATIONARY SOURCES
Projects Type(s): modeling (computer)
NOx controls
Location(s): San Antonio, TX, 06 U.S.A.
Companies: Southwest Research Institute
Gas Research Institute (GRI)
Southern Gas Association
Compressor Research Council
Date: 09/28/92

Southwest Research Institute, of San Antonio, in a program jointly sponsored by the Gas Research Institute, the Southern Gas Association's Pipeline, and the Compressor Research Council, is developing compressor diagnostics software for a pc-compatible program that identifies and quantifies malfunctions in reciprocating compressor performance. Compressors must operate at peak efficiency to minimize NOx emissions. The program provides a simple, accurate method to identify compressor malfunctions and to determine when operational corrections and maintenance are required. (Oil and Gas Journal, September 28, 1992, p. 90)

Index Number: 349
Unique ID: 000307
Main Category: STATIONARY SOURCES
Projects Type(s): modeling (computer)
VOCs
emissions monitoring
benzene control
Location(s): , , U.S.A.
Companies: Radian Corporation
Gas Research Institute (GRI)
Date: 09/04/92

Radian Corp., under contract to the Gas Research Institute, has developed a pc-compatible model, called GRI-DEHY, to estimate BTEX (benzene, toluene, ethyl benzene, and xylene) emissions from glycol dehydrators. The model reportedly can be used to estimate emissions of BTEX compounds and Cl-C4

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hydrocarbons from existing or proposed dehydration units, given input data for the wet gas and the recirculating glycol. It can also investigate how changes in the operation of the dehydration unit affects emissions. GRI-DEHY is based on the simplified process flow diagram consisting of an absorber, a flash tank if present, and a regenerator. The model requires input data for the natural gas and glycol to estimate the emissions of air toxics and hydrocarbons from the regenerator. (E&P Environment, September 04, 1992, V. 3, No. 18)

Index Number: 350
Unique ID: 000385
Main Category: STATIONARY SOURCES
Projects Type(s): natural gas
SO2 controls
injection systems
Location(s): , ,
Companies: Gas Research Institute (GRI)
Armco Steel Co.
Date: 01/04/93

A two-year experiment sponsored by the Gas Research Institute and undertaken at Armco Steel Company's No.3 blast furnace was reported to be successful. The results show that natural gas can be used at higher levels in blast furnaces used to make iron. In the experiment, one-fourth of the coke was replaced with natural gas yielding iron with 20 percent less sulfur accompanied by a 10 percent rise in productivity. Gas injection is considered to be an attractive alternative because of it has low capital costs. The experiment helped define coke replacement ratios and proved that the replacement could be done at higher temperatures. Armco will continue to experiment with higher ratios and temperatures. (Clean Air Network Online Today, 1/4/93).

Index Number: 351
Unique ID: 000299
Main Category: STATIONARY SOURCES
Projects Type(s): NOx controls
emissions monitoring
Location(s): , , U.S.A.
Companies:
Date: 12/28/92

A complete system, including the Model 270 nitric oxide analyzer, HP 5890 II gas chromatograph, column, and accessories, and a thermal converter for the NO2 determinations, measures low ppb levels of NO and NO2 in refinery gas streams. NO is separated by gas chromatography from the olefins in the sample

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and detected by ozone induced chemiluminescence, with a detection limit of <10 ppb for NO. The concentration of NOx is then measured by converting NO2 to NO before gas chromatographic analysis. (Oil and Gas Journal, December 28, 1992, p. 100)

Index Number: 352
Unique ID: 000382
Main Category: STATIONARY SOURCES
Projects Type(s): NOx controls
catalytic technology
ESPs
Location(s): Leverkusen, , Germany
Dormage, , Germany
Companies: Bayer
Date: 11/04/92

Bayer, of Leverkusen, Germany, broke ground on a DM180 million rotary kiln at Dormage, with capacity of 45,000 metric tons/year. To meet new air standards, the facility is pilot-testing a selective catalytic reduction (SCR) unit to remove NOx. The firm also uses its wet-wall electrostatic precipitation technology at its incinerators. (Chemical Week, 11/4/92, p. 25)

Index Number: 353
Unique ID: 000404
Main Category: STATIONARY SOURCES
Projects Type(s): NOx controls
Location(s): , ,
Companies: Infurnox
Date: 02/01/93

The SMR burner, developed by Infurnox, reduces NOx and other emissions to below 10% during refining, petrochemical, and chemical operations. The new burner performs efficiently with all types of fuel gases, including natural gas and mixtures of hydrogen and other hydrocarbon gases. SMR field tests have reportedly proved that CARB air emissions standards can be met in process furnaces while firing varying fuel gas steams. The burner uses the swirling of gas, mixing of air and gas in correct proportions, and recirculation of flue gas within the furnace to provide efficient combustion. The SMR burner is designed for natural draft or forced draft heaters and does not require monitoring to maintain low emission levels. The stability of the SMR reportedly allows it to operate efficiently in all furnace configurations and is suited for retrofitting existing furnaces. (Oil and Gas Journal, 2/1/93, p. 47)

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Index Number: 354
Unique ID: 000252
Main Category: STATIONARY SOURCES
Projects Type(s): petrochemical industry
Location(s): , , France
Companies: Institute Francais du Petrole (IFP)
Date: 01/29/92

France's Institute Francais du Petrole (IFP) is undertaking an aggressive program to broaden its product offering and up its commercial presence in the petrochemicals and refining process licensing field. In order to take advantage of the impact of the Clean Air Act Amendments on the U.S. refining industry, IFP will make the U.S. a key focus of its licensing sales. IFP was created as a national research institute engaged in researching and developing oil exploration and production techniques and developing and licensing refining/petrochemical processes, as well as providing documentation and education resources across the hydrocarbons area. (Chemical Week, 1/29/92, P.56)

Index Number: 355
Unique ID: 000377
Main Category: STATIONARY SOURCES
Projects Type(s): process change - other
Location(s): Baton Rouge, LA, 06 U.S.A.
Companies: Rhone Poulenc
Date: 09/07/92

Rhone Poulenc has concentrated resources on a diphenol-ether-based quaiacol process, to meet air quality requirements, at a new facility in Baton Rouge, LA. (Chemical Marketing Reporter, 9/7/92, p. SR8)

Index Number: 356
Unique ID: 000378
Main Category: STATIONARY SOURCES
Projects Type(s): process change - other
methanol
Location(s): , ,
Companies: Arkansas Eastman
Date: 09/07/92

Arkansas Eastman was able to convert the process for producing the detergent bleach activator nonanoyloxybenzene sulfonate to an aqueous system that reduced methanol effluent. (Chemical Marketing Reporter, 9/7/92, p. SR8)

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Index Number: 357
Unique ID: 000383
Main Category: STATIONARY SOURCES
Projects Type(s): process change - other
Location(s): Pensacola, FL, 04 U.S.A.
Companies: Monsanto
Date: 11/06/92

Monsanto's plant in Pensacola, FL, cut back cyclohexane air emissions by 800,000 pounds through a combination of source reduction, modified air pollution control equipment and energy recovery. (Chemical Marketing Reporter, 11/6/92, p. SR21)

Index Number: 358
Unique ID: 000384
Main Category: STATIONARY SOURCES
Projects Type(s): process change - other
trichloroethylene (TCE)
Location(s): Nitro, WV, 03 U.S.A.
Companies: Monsanto
Date: 11/06/92

Monsanto's plant in Nitro, WV, reduced trichlorethylene emissions by 256,000 pounds through process changes that eliminated use of the solvent. (Chemical Marketing Reporter, 11/6/92, p. SR21)

Index Number: 359
Unique ID: 000243
Main Category: STATIONARY SOURCES
Projects Type(s): recycling
Location(s): Hampton, NH, 01 U.S.A.
Baltimore, MD, 03 U.S.A.
Companies: Wheelabrator Environmental Systems
Date: 06/01/92

Municipal waste-to-energy plants have seen increases in the efficiency of their thermal cycles allowing them to produce more power through the recycling of waste. Wheelabrator Environmental Systems of Hampton, NH, was reportedly the first to utilize utility-grade, high-temperature, high-pressure steam at 850 degrees fahrenheit and 900 psi at their Baltimore and Westchester facilities. This development was described as an advance in the state-of-the-art. (Environmental Projects, 6/92, p.7)

Index Number: 360

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Unique ID: 000244
Main Category: STATIONARY SOURCES
Projects Type(s): scrubbers
filters/traps
mercury controls
particulates
Location(s): , , Germany
Companies: Coburg
Date: 04/23/92

Solid waste incinerator technology that reportedly achieves near perfect reductions of toxic emissions exists at the Coburg facility in Germany, which employs a spray dryer, fabric filter, a packed wet scrubber, and an electrostatic precipitator to control pollution. Particulate emissions from the Coburg facility have been measured at $1\text{mg}/\text{m}^3$ and metals emissions have been recorded at less than $0.05\text{mg}/\text{m}^3$. The removal efficiency at the facility approaches 99 percent for all toxic gases, and 95 percent for mercury. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 361
Unique ID: 000245
Main Category: STATIONARY SOURCES
Projects Type(s): scrubbers
ESPs
mercury controls
injection technology
Location(s): , , U.S.A.
Companies:
Date: 04/23/92

Available technology options for controlling emissions of mercury from solid waste incinerators include: wet scrubbers; wet electrostatic precipitators; sulfide (NaOH) injection (which reduces mercury to form easily removable inert compounds); and activated carbon, which oxidizes and chemically adsorbs mercury. Of those, sulfide injection and activated carbon have been judged as the most effective approaches. Activated carbon, in particular, yielded removal efficiencies in the range of 88 - 94 percent. Two other approaches to reducing mercury emissions include: decreasing the amount of mercury in batteries to detection levels which should virtually eliminate mercury from the waste stream by 1995, and source separation/recycling which involves recycling batteries. A continuous emissions monitoring (CEM) system for mercury has been cited as an urgently needed technology. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

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Index Number: 362
Unique ID: 000250
Main Category: STATIONARY SOURCES
Projects Type(s): scrubbers
hydrogen
recycling
SO2 controls
Location(s): San Diego, CA, 09 U.S.A.
Sardinia, , Italy
Ispra, , Italy
Companies: General Atomics Co.
Joint Research Centre of European Community
Date: 03/02/92

Buoyed by successful pilot plant testing overseas, General Atomics Co. of San Diego is talking with several companies and utilities interested in demonstrating a bromine-based scrubber capable of removing virtually all heavy metals emitted during coal burning. Part of General Atomics' U.S. marketing strategy centers around the technology's recent small-scale testing at an oil refinery in Sardinia, Italy. Two to three months of 8-MW testing have reportedly been successful. General Atomics is commercializing the technology, born out of the Joint Research Centre of the European Community in Ispra, Italy. The system reportedly removes about 95 percent of SO2, produces no waste, and gives off a marketable by-product in the form of sulfuric acid. More importantly, due to the chemistry of hydrogen bromide, which the process generates, the system allegedly has the ability to remove heavy metals, although this never actually has been proven. The system is also reputed to produce and recycle hydrogen, which can be sold or burned as process fuel, and decreases reagent costs relative to conventional wet scrubbing. Costs to restore lime and limestone, a wet system's primary reagents, can be expensive and are often compounded by sludge disposal expenses. ISPRA, in contrast to traditional scrubbers, generates no sludge or blowdown water stream and the sulfuric acid is salable. (Coal & Synfuels Technology, 3/02/92, V. 13, No. 9)

Index Number: 363
Unique ID: 000241
Main Category: STATIONARY SOURCES
Projects Type(s): SO2 controls
hydrogen
ethanol
Location(s): St. Paul Park, MN, 05 U.S.A.
Companies: Ashland Petroleum Co.
Date: 08/31/92

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Ashland Petroleum Co. has started construction on six projects totaling \$114 million at its 67,100 b/cd St. Paul Park, MN, refinery to enable the plant to produce cleaner burning fuels and reduce emissions. Projects include: a \$50 million distillate desulfurizer completed by the end of 1993; utilities and offsite units such as electrical substations, cooling water facilities, condensate recovery, sewers, and additional tanks all completed by the end of 1993; a 10 MMcfd hydrogen plant expected to cost \$14 million for hydrogen to desulfurize diesel fuel in the new distillate desulfurizer; an ethanol handling facility to meet state requirements for expanded use of the fuel in the Twin Cities area; a 50 ton/day sulfur recovery/Shell Claus offgas treating (SCOT) unit by the end of 1992 that will recover sulfur from process gases and reduce sulfur dioxide emissions; and \$7 million in upgrades to refinery controls including the installation of digital distributed control systems for process units by the end of 1993. (Oil and Gas Journal, 8/31/92, p. 20)

Index Number: 364
Unique ID: 000242
Main Category: STATIONARY SOURCES
Projects Type(s): SO2 controls
Location(s): , , U.S.A.
Companies: Georgia-Pacific
Date: 06/15/92

Georgia-Pacific reportedly found a better way to lower SO2 emissions at a paper mill boiler. The procedure uses an internally generated alkaline process stream to get big reductions when burning high-sulfur oil. (Air Quality Week, 6/15/92)

Index Number: 365
Unique ID: 000249
Main Category: STATIONARY SOURCES
Projects Type(s): SO2 controls
particulates
Location(s): , UT, 08 U.S.A.
Companies: Kennecott Corporation
Date: 03/11/92

Kennecott Corporation plans to build a new smelter and modernized refinery at the company's Utah Copper operations to reduce the facility's sulfur dioxide emissions and promote other environmental benefits. When completed in 1995, the new Kennecott facility will be the world's cleanest smelter. SO2 emissions will be cut to approximately five percent of the allowable limit under the Utah State Implementation Plan. Particulate emissions also will be eliminated significantly. The smelter project has a estimated cost of \$860 million and will result in the addition of 3,300 jobs over a three year

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period. More than 500 separate Utah companies will benefit from contracts created by the construction of the smelter. (Kennecott Corporation press materials, 3/11/92)

Index Number: 366
Unique ID: 000308
Main Category: STATIONARY SOURCES
Projects Type(s): steel industry
emissions controls (gen)
Location(s): , , U.S.A.
Companies:
Date: 10/02/92

Researchers are reportedly investigating several options for better controlling emissions by the steelmaking industry. Non-recovery coke-making is an option in which fugitive emissions would be limited by maintaining a negative pressure within the coke ovens so that equipments leaks would draw air into the ovens instead of releasing by-products into the ambient air. By-products that currently are recycled would be oxidized and released into the air in the forms of carbon dioxide, water vapor and oxides of sulfur and nitrogen. (American Metal Market, October 20, 1992, p. 4)

Index Number: 367
Unique ID: 000306
Main Category: STATIONARY SOURCES
Projects Type(s): VOCs
benzene control
Location(s): , , U.S.A.
Companies: Radian Corporation
Gas Research Institute (GRI)
Date: 09/04/92

Under contract to the Gas Research Institute, Radian Corp. has developed an emissions control process that combines proven technologies to maximize the efficiency of BTEX (benzene, toluene, ethyl benzene, and xylene), and other VOC, recovery from glycol dehydrators while retaining recovered hydrocarbons for resale. The process, called R-BTEX, is based on stripping, condensation, and phase separation. R-BTEX is designed for new or retrofit applications, and operates at temperatures that proved greater than 95% recovery of BTEX as a saleable liquid, and can control BTEX emissions by as much as 99.9% if vented BTEX is controlled at the condenser vent and flash tank. R-BTEX is reportedly the most cost-effective alternative for controlling BTEX emissions from glycol dehydrators. (E&P Environment, September 04, 1992, V. 3, No. 18)

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Index Number: 368
Unique ID: 000379
Main Category: STATIONARY SOURCES
Projects Type(s): VOCs
CFCs, HFCs, HCFCs
NOx controls
COx controls
Location(s): Santa Clara, CA, 09 U.S.A.
Companies: Alzeta Corp.
Date: 11/23/92

The Alzeta Corporation of Santa Clara, has introduced an inward-fired, adiabatic radiant burner that will reportedly obviate the need for the long burn time, high temperatures and turbulency typical of thermal oxidation technologies. The Alzet device mixes the gases containing VOCs with natural gas, which is forced through a porous ceramic burner. Forcing the individual molecules of the mixture through the combustion zone lowers both the temperature and time required. Turbulence that causes formation of NOx is reportedly nearly nonexistent. The company claims that the adiabatic radiant burner can achieve destruction and removal efficiency of over 99.9% for chlorinated and non-chlorinated hydrocarbons and NOx and carbon monoxide levels lower than 10 ppm. (Clean Air Network Online Today, 11/23/92)

Index Number: 369
Unique ID: 000313
Main Category: STRATOSPHERIC OZONE
Projects Type(s): catalytic technology
ethylene
Location(s): , , U.S.A.
Companies: PPG Industries Inc.
Date: 12/14/92

A new catalyst-grade perchlorethylene is being offered by PPG Industries Inc., as a substitute for carbon tetrachloride in the petroleum industry for isomerization and reformer units. Used to improve platinum-based catalysts by providing hydrochloric acid as a promoter for activity and stability, the new product reportedly has no ozone depletion potential and is nonflammable, readily available and compatible with current delivery systems. (Oil and Gas Journal, December 14, 1992, p. 50)

Index Number: 370
Unique ID: 000231
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): Englewood, CO, 08 U.S.A.

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Companies: Climatron Corporation
Date: / /

Climatron Corporation, of Englewood, Colorado, will design, produce, install, and test an advanced, two-stage air conditioning system in transit buses, using indirect-direct cooling technology. This system uses no CFCs. In addition to eliminating CFCs, vehicle fuel consumption can be expected to decrease by about one gallon per hour of operation, thereby reducing tailpipe emissions. (EPA Announcement of 1992 Small Business Pollution Prevention Grants awarded)

Index Number: 371
Unique ID: 000232
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
natural gas
Location(s): , , U.S.A.
Companies:
Date: 06/01/92

Natural gas cooling is becoming an increasingly attractive alternative to electric air conditioning. The high cost of electricity, potential capacity shortages during peak demands, and environmental concerns are causing people to shy away from electric air conditioning. Natural gas cooling reduces costs without reducing comfort, and does not use any ozone-damaging CFCs, which are an integral part of electric cooling systems. (Plants, Sites and Parks, 6/92)

Index Number: 372
Unique ID: 000233
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): , , U.S.A.
Companies: Airspray International
Proctor & Gamble
Date: 04/27/92

Alternatives to aerosols, such as pump mechanisms, are continually being researched and tested. One of the most recognizable products to incorporate this technology is Vidal Sassoon hairspray by Proctor & Gamble. The Vidal Sassoon hairspray formulation contains hydrocarbon propellant, alcohol, and resin, which is distributed through an air pressure pump system developed by Airspray International. Proctor & Gamble has a \$10 million exclusivity agreement with Airspray International to use the pump system through 1992. (Chemical Marketing Reporter, 4/27/92, p.SR20)

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Index Number: 373
Unique ID: 000234
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): , , U.S.A.
Companies: W.R. Grace & Company
Date: 04/23/92

W.R. Grace & Co. is also developing an aqueous CFC substitute for cleaning operations. (Summary of Proceedings, The Clean Air Marketplace Conference, 4/22/92 - 4/23/92)

Index Number: 374
Unique ID: 000235
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): , , U.S.A.
Companies: EPA Air and Energy Engineering Research Laboratory
(AEERL)
Date: 04/01/92

Hydrofluorocarbon (HFC), a new compound being examined by EPA's AEERL as a possible replacement for CFC-114 refrigerant, has passed the next round of testing and continues to look attractive. The compound, whose code name is HFC-236ea, contains no chlorine or bromine capable of destroying stratospheric ozone and has an estimated lifetime in the atmosphere of approximately 2 to 4 years, thus minimizing any impact the chemical could have on global warming. AEERL is continuing to examine the attributes of HFC-236ea and is discussing with the Navy the possibility of cooperative evaluation of the chemical in actual refrigeration equipment as the next step. (ORD Engineering Highlights, 4/92, p.1)

Index Number: 375
Unique ID: 000236
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): Fullerton, CA, 09 U.S.A.
Companies: General Motors' Hughes Aircraft
Date: 01/01/92

Hughes Aircraft of Fullerton, CA, a subsidiary of GM Hughes Electronics has developed a manufacturing process for electronics using a non-toxic formula with a citric acid-base that is soluble in water and does not require

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environmentally damaging CFC's. Hughes engineers expect the new solution, named HF1191, and processes can remove up to two-thirds of the CFC-based solvents required in the company for the soldering of military electronics amounting to approximately 300,000 pounds of CFC's per year. (Hughes Aircraft Company, Public Relations Department, 1/92)

Index Number: 376
Unique ID: 000237
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): Boulder, CO, 08 U.S.A.
Companies: Kryptonics Inc.
Date: / /

Kryptonics Inc. of Boulder, CO has developed an innovative method of spraying silicone mold release that eliminates the use of chlorofluorocarbons (CFCs) in its production of polyurethanes. As a result of this project, Kryptonics has reduced its usage of CFCs from 40,000 pounds in 1990 to zero in 1992. Equipment based on the technology from this project will soon be made available to other firms and industries. (EPA Office of Pollution Prevention)

Index Number: 377
Unique ID: 000238
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
dryers
Location(s): San Jose, CA, 09 U.S.A.
Companies: IBM
Date: / /

IBM's San Jose disk drive development and manufacturing operations for its U.S. mainframe computers was one of the world's largest users of chlorofluorocarbons (CFCs) for disk drive parts cleaning and drying. The program instituted by IBM has substituted aqueous cleaning and hot air drying technologies for CFC processes and reported emissions have dropped by 95 percent. (EPA Office of Pollution Prevention)

Index Number: 378
Unique ID: 000239
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
COx controls
dryers

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Location(s): Philadelphia, PA, 03 U.S.A.
Iselin, NJ, 02 U.S.A.
Companies: ICC Technologies
Engelhard Corporation
Date: 06/22/91

ICC Technologies, an air-conditioning company based in Philadelphia, PA, has developed a new cooling system that uses ordinary water in place of ozone-destroying chemicals and provides cooling for a small fraction of the energy of conventional systems. The secret to the cooling system is a new desiccant, or drying agent, developed by Engelhard Corporation of Iselin, N.J. The new desiccant is, ounce for ounce, far more effective than the old desiccants. If the system succeeds, a radically different approach to cooling could emerge that could reduce the demand for electricity and, thus, reduce the use of fuels by utilities that supply electricity. The new system would eliminate the use of ozone-harming CFC's, reduce emissions of pollutants that form acid rain and smog, and reduce carbon dioxide which causes global warming. (New York Times, 6/22/91, D1-2)

Index Number: 379
Unique ID: 000386
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
ethylene
Location(s): , ,
Companies: E.I. du Pont de Nemours (Du Pont)
Date: 12/14/92

E.I. du Pont de Nemours & Co., reportedly is using perchloroethylene as a precursor in the production of HFC-134a, a zero ozone depleting replacement for CFC-12 in mobile air conditioners. (Chemical Marketing Reporter, 12/14/92, p. 3)

Index Number: 380
Unique ID: 000387
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): Calvert City, KY, 04 U.S.A.
Companies: Atochem
Date: 12/14/92

Atochem is reportedly using 1,1,1-trichloroethane as a raw material for HFC-141b and HCFC-142b, both alternatives to CFCs, at its 110-million pound plant in Calvert City, KY. (Chemical Marketing Reporter, 12/14/92, p. 3)

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Index Number: 381
Unique ID: 000388
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
catalytic technology
Location(s): Santa Ana, CA, 09 U.S.A.
Companies: Ultrox
Date: 11/01/92

Ultrox, Santa Ana, CA, is developing a system that uses ozone and a patented granular catalyst to destroy chlorinated organics and aromatics in air. Tests have been conducted with removal rates of 99 percent achieved. In the system, air is exposed to the catalyst and ozone. The air then flows through a bed of sorbent, which removes the acids produced during treatment of the chlorinated compounds. The capital and operating costs of the system are expected to be less than for carbon treatment. (AirTECH News, 11/92, p. 159)

Index Number: 382
Unique ID: 000389
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
emissions monitoring
Location(s): Pittsburgh, PA, 03 U.S.A.
Companies: Mine Safety Appliances
Date: 11/01/92

A system that detects leaks of chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs) and ammonia has been introduced by Instrument Division of Mine Safety Appliances Co., Pittsburgh, PA. The instrument can be set up to give an alarm and the sensors, which are resistant to degradation from high concentrations of the refrigerants and ammonia, can be located up to 3,300 feet from control modules. MSA also supplies an infrared photo-acoustic sensing technology for detecting low-level concentrations of HCFC-123 and HFC-124A. (AirTECH News, 11/92, p. 159)

Index Number: 383
Unique ID: 000411
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
biological technology
Location(s): , ,
Companies: Envirogen
Date: 01/01/93

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A recent feasibility study by Envirogen researchers has reportedly shown that the methanotrophic bacterium *Methylosinus trichosporium* can break down several hydrochlorofluorocarbons and hydrofluorocarbons previously considered resistant to biodegradation. Organisms that degrade halogenated hydrocarbons might eventually form the basis of emission control systems at production and recycling facilities that produce ozone-depleting gases. They also may be used as bioremediation agents at chemical spill sites. The initial evaluation was a complete stoichiometric analysis of HFC-21, which verified the dehalogenation of HCFC-21 with gas chromatography, mass spectrometry, and ion chromatography. Samples of eight CFC-replacement compounds were introduced to *M. trichosporium* under aerobic conditions in sealed vials. The bacteria degraded HCFCs 21, 141b, and 131 and HFC- 143. Degradability analysis and HCFC- and HFC- degradation services are expected to be provided eventually. (Industrial Bioprocessing, 1/93, V. 15, No. 1)

Index Number: 384
Unique ID: 000420
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
recycling
Location(s): , ,
Companies: R3 Systems
Date: 01/18/93

R3 Systems signed a CFC disposal agreement with three waste disposal companies: Guadaloupe Landfill, Newby Island Landfill, and Tri-Cities Recycling and Disposal Facility. R3 Systems has worked out arrangements with the facilities to handle refrigerant and refrigerant oil disposal from the appliances brought to them. R3 will use a certificate for each appliance that shows the refrigerant has been removed and contained. (Air Conditioning, Heating & Refrigeration News 1/18/93, p. 7)

Index Number: 385
Unique ID: 000421
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): , ,
Companies: Kaeser Compressors
Date: 12/03/92

Kaeser Compressors, Inc. announces the incorporation of R22 (HCFC) condensing units in all refrigerated air dryers above 10 scfm. R22 reportedly eliminates 95 percent of ozone depleting compounds. All Kaeser refrigerated dryers feature service valves as standard thus avoiding the venting of CFCs and HCFCs

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which can occur when servicing some valveless dryer designs. (News Release 12/3/92)

Index Number: 386
Unique ID: 000422
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
VOCs
Location(s): , ,
Companies: Glidsafe
Date: / /

Glidsafe terpene solvents are promoted as an ozone-safe replacement for restricted solvents, including 1,1,1,-trichloroethane, methyl ethyl ketone, mineral spirits, trichloroethylene, perchloroethylene, xylene, and 2-butoxyethanol (EB). Unlike other chemicals, they are non-toxic, biodegradable, and nonchlorinated. Furthermore, they possess a low odor, high flash point, low residue, low vapor pressure, minimum waste discharge, low VOC emissions, and reportedly have no ozone depleting, global warming or carcinogenic potential. (Spray Technology & Marketing, 1/93, pp. 32-33)

Index Number: 387
Unique ID: 000423
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
Location(s): , ,
Companies: Solutions Software Company
Date: 12/18/92

The CFC Solutions Database, a software package published by the US-based Solutions Software Company, allows users to look up specific, step-by-step solutions to a given CFC replacement problem. The latest version of the database, due out in January, will include the text of applicable Clean Air Act requirements. (Global Environmental Change Report 12/18/92, v. 4, No. 24)

Index Number: 388
Unique ID: 000424
Main Category: STRATOSPHERIC OZONE
Projects Type(s): CFCs, HFCs, HCFCs
recycling
Location(s): , , Canada
Hartsville, TN, 04 USA
Wasco, IL, 05 USA

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Companies: Air-Conditioning and Refrigeration Institute (ARI)
Mueller Industries
Pace Machiner Group
ENSPECO
Atlanta Special Products Division
Date: 01/25/93

The Air-Conditioning and Refrigeration Institute (ARI) announced that three additional companies are now participating in its certification program for refrigerant recovery/recycling machines. This brings the total number of participating companies to 24. The additions are: ENSPECO Inc. of Cocagne, Canada; Mueller Industries of Hartsville, TN; and Pace Machiner Group Inc. of Atlanta Special Products Division, Wasco, IL. ARI's certification program for refrigerant recovery and recycling equipment provides independent verification of a unit's recovery rates and recycling ability, including chemical analysis for contaminants. This type of refrigerant recovery/recycling equipment can be used to eliminate the venting of CFCs and HCFCs during service or disposal. (Environmental Information Networks 1/25/93)

Index Number: 389
Unique ID: 000314
Main Category: STRATOSPHERIC OZONE
Projects Type(s): coatings/paints/plating
VOCs
Location(s): , , U.S.A.
Companies: U.S. Navy
Date: 08/20/92

The U.S. Navy's newest jet fighter, the F/A-18 E/F is expected to be produced using manufacturing processes that cut down on toxic wastes and be maintained using less dangerous substances. The manufacturing and maintenance procedures for the new design will reportedly be designed to ensure that ozone-depleting (halons and CFCs), high VOC, coating, cleaning solvents, heavy metals (chromium and cadmium), and other toxic materials are avoided wherever possible. (Environment Week, August 20, 1992, V. 5, No. 33.)

Index Number: 390
Unique ID: 000390
Main Category: STRATOSPHERIC OZONE
Projects Type(s): SO2 controls
membranes technologies
Location(s): Menlo Park, CA, 09 U.S.A.
Companies: Membrane Technology and Research
Date: 10/01/92

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Researchers at Membrane Technology and Research, Inc. (MTR) of Menlo Park, CA, have identified a co-polymer membrane material that is highly selective for sulfur from gas streams and can remove 90 to 99 percent of the sulfur dioxide in off-gas generated by reverberatory non-ferrous smelters. A pilot unit will be tested and evaluated in a parametric study at MTR laboratories to generate data needed to optimize the process and to demonstrate its reliability and efficiency. There has been some speculation that a marketable product could be developed by combining the membrane with a compression/condensation system. MTR plans to further develop the membrane for removing hydrogen sulfide from natural gas. A field trial is planned with a bench-scale system in a collaborative effort with Hoechst Celanese Separations Products Division. (AirTECH News, 10/92, p. 136)

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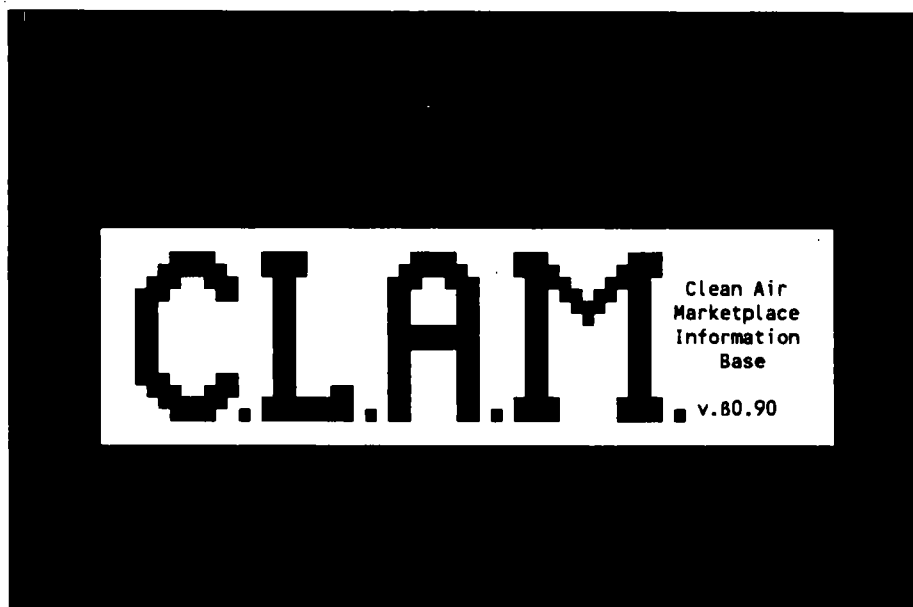
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PA, Merion Station, U.S.A.	266
PA, Philadelphia, U.S.A.	132 378
PA, Pittsburgh, U.S.A.	173 183 188 230 268 317
382	
PA, Stoyville, U.S.A.	183
PA, Warminster, U.S.A.	22
PA, Warren, U.S.A.	79
PA, Williamsport, U.S.A.	188
SD, Sioux Falls, U.S.A.	76 81
TN, , U.S.A.	190 246 257
TN, Hartsville, USA	388
TN, Spring Hill, U.S.A.	14
TX, , U.S.A.	94 123 124 304 305
TX, , USA	330
TX, Austin, U.S.A.	154 263 345
TX, Beaumont, U.S.A.	117 135
TX, Clear Lake, U.S.A.	114
TX, Corpus Christi, U.S.A.	90 126 129
TX, Dallas, U.S.A.	114 159
TX, Deer Park, U.S.A.	31 136 142
TX, Fort Worth, U.S.A.	284
TX, Freeport, U.S.A.	20 102
TX, Hallsville, U.S.A.	263
TX, Houston, U.S.A.	28
TX, Houston, USA	72

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TX, Houston, U.S.A.	103 129 132 144 153 162
199 201 334 341	
TX, La Porte, U.S.A.	129
TX, Marshall, U.S.A.	51
TX, Mont Belvieu, U.S.A.	132 133 148 156
TX, Morgan's Point, U.S.A.	140
TX, Pasedena, U.S.A.	140
TX, Point Comfort, U.S.A.	101
TX, Port Neches, U.S.A.	130
TX, San Antonio, U.S.A.	348
TX, Seadrift, U.S.A.	37
TX, Stafford, USA	36
TX, Texas City, U.S.A.	138
TX, The Woodlands, U.S.A.	132
TX, Woodlands, U.S.A.	156
UT, , U.S.A.	365
UT, Salt Lake City, USA	26
VA, , USA	181
VA, , U.S.A.	234 235
VA, Clarksburg, U.S.A.	244
VA, Fairfax, U.S.A.	213
VA, Richmond, U.S.A.	139 209
VA, Yorktown, U.S.A.	91 203
WI, , U.S.A.	190 305
WI, De Pere, U.S.A.	44
WI, Milwaukee, U.S.A.	65 95 218 226
WV, , U.S.A.	165 167 236
WV, Charleston, U.S.A.	113 160
WV, Glenville, U.S.A.	160
WV, Institute, U.S.A.	37
WV, Lewisburg, U.S.A.	333
WV, Mt. Storm, U.S.A.	248
WV, New Haven, U.S.A.	186
WV, Nitro, U.S.A.	358
WY, , U.S.A.	212
WY, Cheyenne, U.S.A.	125 129
WY, Gillette, U.S.A.	260

HARPER

THE CLEAN AIR MARKETPLACE (CLAM) DATABASE



USER'S GUIDE

(UPDATED FEBRUARY 1993)

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APPENDIX A: SAMPLE PRINTOUT

CHAPTER 2: INTRODUCTION

2.1 Overview and Purpose

The Clean Air Marketplace (CLAM) database was developed for EPA's Office of Air and Radiation (OAR) to store and organize information on technological innovations, discrete projects, joint ventures, and export opportunities associated with air pollution control technologies stemming from the Clean Air Act Amendments of 1990. The stored data summarizes pertinent information cited in newspapers, trade journals, company press releases, and other public sources. Each project is stored as a paragraph of text describing the project along with additional data, such as project type, location (city, state, region, country), company, and date and source of article associated with the entry. The information for the database is drawn from over 1000 publications from two Online database services. (Note: No attempt has been made to verify the accuracy of the information from the original articles.)

This manual is designed to help system users locate information in a fast and effective manner. It is meant to be used as an instruction guide for first-time users, and as a general reference guide any time the system is used. Step-by-step instructions are provided along with a sample search that uses all of the functions of the system. These instructions are supplemented with reproductions of screen displays to illustrate each function and feature of the system.

The remainder of this document consists of three chapters:

- **Chapter 3, "Data Fields,"** provides a description of each field into which data have been entered.
- **Chapter 4, "General System Information,"** provides instructions for entering and exiting the system, describes the frequently used function keys and commands, and gives an overview of the pull-down menus.
- **Chapter 5, "Using the System,"** gives instructions for entering a new record, viewing the entries, performing a custom search, creating a custom sort, and printing the results.

2.2 Major Functions of the Database

The system contains four major components: **spreadsheet**, **data search**, **custom sort**, and **print**. The following is a summary of the basic functions of the database. The **spreadsheet** function allows the user to view the information stored in the fields of the database. The **search** function allows the user to pare down the spreadsheet by searching for specific information in any or all of the search fields. The **sort** function enables users to change the order of how information from a search is displayed in the printout by establishing a custom-ordered listing of the entries. Finally, the **print** function

allows users to transfer information from the database to WordPerfect and then print from WordPerfect.

2.3 Where to Find Help

For help concerning the CLAM database, users should contact Steve Harper of the Office of Policy Analysis and Review at (202) 260-8953.

While operating the database, users can obtain help or information by pressing [F1] at any point while using the system. The database will display information about the current screen. In addition, if further help is needed, consult this Users Guide.

CHAPTER 3: DATA FIELDS

This chapter provides a general description of the fields into which data have been entered.

3.1 Description of Each Data Field

For each project in the database, data have been entered into 12 fields. Each field is described below.

- **Paragraph of Text:** a brief summary of the clean air innovation, discrete project, joint venture, or export opportunity from the original article. The paragraph is a concise summary of the project as described in the original source.
- **Unique Identification Number:** a randomly assigned six-digit number that is unique for each entry. This number remains static even when the index number on the printout changes. (For more information on the difference between the unique identification number and the index number, see Section 5.3.3, "Printout").
- **Main Category:** the first tier of classification for each entry. There are six categories into which projects have been entered:
 - Air Toxics;
 - Coal/Acid Rain;
 - Mobile Sources;
 - Stationary Sources;
 - Alternative Fuels; and
 - Stratospheric Ozone.

Each project can only have one main category. For custom search purposes, a look-up table exists for this field.

- **Project Type:** the second tier of classification used to provide more detailed information on the specific type of project(s) associated with each entry (as many as four project types can be assigned for each project). Examples include MTBE, electric vehicles, and catalytic technology. Project types can be assigned to any main category. For example, MTBE could be found under Mobile Sources as well as Alternative Fuels. For the sake of consistency in performing a custom search, a look-up table exists for this data field.
- **Country:** the country or countries (up to five) where the project occurs, or the countries that are mentioned in the paragraph of text.

- **State:** the state(s), up to five, where the project occurs, or the state(s) that are mentioned in the paragraph of text.
- **Region:** the EPA region(s), up to five, corresponding with the state field, where the project occurs, or region(s) that are mentioned in the paragraph of text. (**Note:** The entry must be two digits; e.g. Region 4 is entered as '04.')
- **City:** the city or cities (up to five) where the project occurs, or cities that are mentioned in the paragraph of text.
- **Company:** the company or companies (up to five) that are sponsoring the project or that are mentioned in the paragraph of text.
- **Source:** the source of the information (i.e. newspaper, trade journal, etc.) where the project has been discussed. This makes it easy for database users to refer to the original source materials for more information on the project.
- **Date:** The date of the source of information.
- **Trade/Export:** The Trade/Export field identifies whether there are trade or export opportunities associated with the entry. This field has been entered as either a "Y" or an "N."