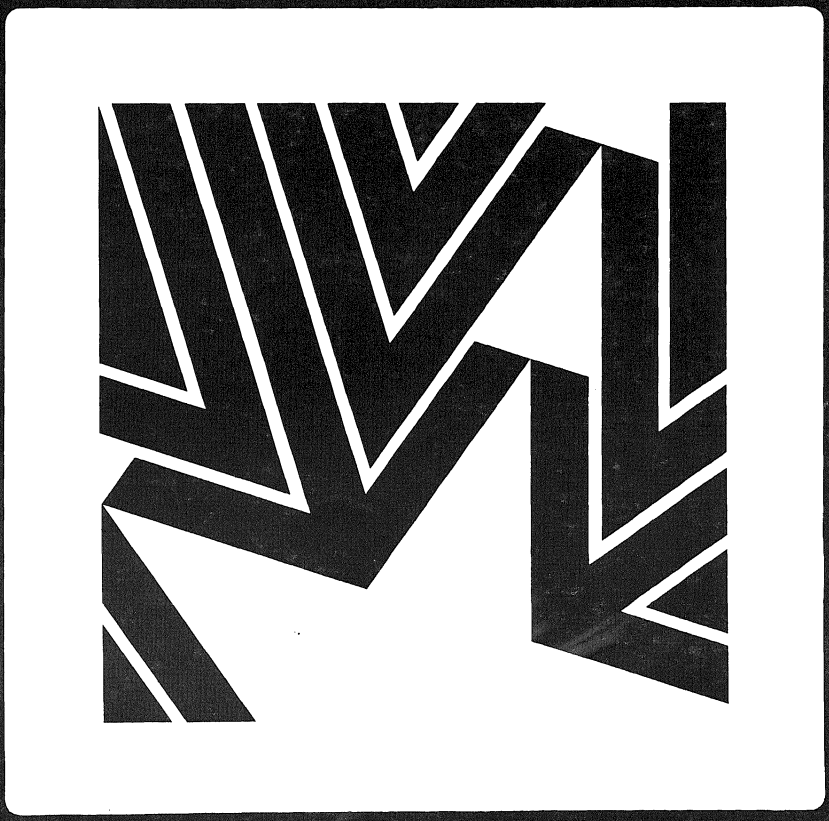
EAPA Vol. 8, No.
December 19

Energy Abstracts for Policy Analysis

A Current Awareness Journal



Technical Information Center
U. S. Department of Energy

CURRENT AWARENESS PUBLICATIONS ON ENERGY

To provide complete coverage of literature related to major Department programs, announcement publications that are comprehensive in their coverage of certain energy fields are issued regularly. All information in these publications, plus additional backup information, is included in the Energy Data Base of the Technical Information Center; all references are also available for machine searching via the on-line retrieval system, DOE/RECON, and the commercial on-line retrieval systems. Descriptions of these current awareness publications, which are supported either directly or indirectly by the DOE, appear below. Department of Energy components may receive the listed publications free from the Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830. Telephone (615) 576-1303, (FTS) 626-1303.

PUBLICATIONS OF THE TECHNICAL INFORMATION CENTER

Energy Abstracts for Policy Analysis (EAPA)

A monthly abstract journal devoted to the analysis of energy research, conservation, and policy. Scope and coverage are limited to substantive articles or reports and emphasize the following programmatic efforts; legislative, regulatory, and other legal aspects; social, economic, and environmental impacts; regional and sectoral analyses; institutional factors, etc. *EAPA* is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402; domestic subscribers $4.50, foreign $5.65 per copy; annual cumulative index, domestic $7.00, foreign $8.75 per copy. The annual subscription price is $48.00 for domestic subscribers and $60.00 for foreign subscribers.

Energy Research Abstracts (ERA)

A comprehensive semimonthly abstract journal devoted to all areas of energy-related information produced by the Department of Energy, other U. S. government organizations, and foreign governments. *ERA* is available to the public on a subscription basis from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. The subscription rate for the 24 semimonthly issues is $150.00 for domestic subscribers and $187.50 for foreign subscribers. A single issue costs $6.50 (domestic) or $8.15 (foreign).

The following publications are available to the public on a subscription basis from the National Technical Information Service (NTIS), Springfield, Virginia 22161. The annual subscription rate for one volume (calendar) year (12 issues plus cumulative index) is $75.00 for domestic subscribers and $150.00 for subscribers outside the North American Continent, except as listed below for *DOE Patents Available for Licensing (PAL)*. A single issue is $7.00 (domestic) and $14.00 (outside the North American Continent).

Current Energy Patents (CEP)

A monthly publication providing abstracting and indexing coverage of the international patent literature, including patent applications, that concerns any aspect of energy production, conservation, and utilization. Available as PB82-902800.

DOE Patents Available for Licensing (PAL)

DOE is prepared to grant exclusive or nonexclusive, revocable licenses under DOE-owned U. S. patents and patent applications; this semiannual publication provides abstracting and indexing coverage to this literature. Available as PB82-946800; the annual subscription price is $14.00 (domestic) and $28.00 (foreign).

Energy and the Environment (EAE)

A monthly abstract journal devoted to information on the impacts of energy related activities and radioactive and nonradioactive pollutants on the environment. Available as PB82-914900.

Fossil Energy Update (FEU)

A monthly abstract journal devoted to information on the processing and use of fossil fuels. Available as PB82-914600.

Fusion Energy Update (FEU)

A monthly abstract journal devoted to information on controlled thermonuclear research. Available as PB82-915300.

Geothermal Energy Update (GEU)

A monthly abstract journal devoted to information on the exploration and development of geothermal resources. Available as PB82-914700.

Solar Energy Update (SEU)

A monthly abstract journal devoted to information on the utilization of solar energy, including biomass and tidal and wind power. Available as PB82-914500.

The following publications are available from the National Technical Information Service (NTIS), Springfield, Virginia 22161. The annual rate for one volume (calendar) year (24 issues) is $40.00 for domestic subscribers and $80.00 for subscribers outside the North American Continent.

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A semimonthly current awareness bulletin covering the following areas: photovoltaics, magnetohydrodynamics, electrohydrodynamics, thermoelectrics, thermionics, and fuel cells. Available as PB82-946600.

Nuclear Fuel Cycle (NFC)

A semimonthly current awareness bulletin covering all aspects of the nuclear fuel cycle, both front end and back end. Available as PB82-913400.

Nuclear Reactor Safety (NRS)

A semimonthly current awareness bulletin covering the following safety aspects: accident analysis, safety systems, radiation protection, decommissioning and dismantling, and security measures. Available as PB82-913800.

Radioactive Waste Management (RWM)

A semimonthly current awareness bulletin covering the following management aspects: transport and storage of wastes; processing; waste disposal; waste storage; radioactive effluent; and shipping containers. Available as PB82-913600.

INTERNATIONAL ENERGY PUBLICATIONS

Atomindex (Published in cooperation with the Technical Information Center by the International Atomic Energy Agency, International Nuclear Information System, Vienna, Austria)

A semimonthly abstract journal devoted to information on nuclear science and technology. Through an exchange agreement, IAEA/INIS provides all non-U. S. nuclear information of *Atomindex* to TIC for inclusion in the Energy Data Base; in turn, TIC provides all U. S. nuclear information to IAEA/INIS for inclusion in *Atomindex*. *Atomindex* is available by subscription from UNIPUB, 345 Park Avenue South, New York, NY 10010. The cost of an annual subscription, 24 semimonthly issues and semiannual and annual cumulative indexes, is $290.

Coal Abstracts (Published in cooperation with the Technical Information Center by the International Energy Agency, IEA Coal Research, London, England)

A monthly abstract journal devoted to information on coal. Through an exchange agreement, IEA Coal Research provides non-U. S. coal information of *Coal Abstracts* to TIC for inclusion in the Energy Data Base; in turn, TIC provides all U. S. coal information to IEA Coal Research for inclusion in *Coal Abstracts*. *Coal Abstracts* is available to Department of Energy components and contractors from the Technical Information Center. Non-DOE organizations may obtain *Coal Abstracts* from IEA Coal Research, Technical Information Service, 14-15 Lower Grosvenor Place, London SW1W 0EX, England, for 100 pounds sterling per year.

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ENERGY ABSTRACTS FOR POLICY ANALYSIS

ABOUT THE TECHNICAL INFORMATION CENTER

The Technical Information Center in Oak Ridge, Tennessee, has been the national center for scientific and technical information for the Department of Energy (DOE) and its predecessor agencies since 1946. In developing and managing DOE's technical information program, the Center places under bibliographic control not only DOE-originated information but also worldwide literature on scientific and technical advances in the energy field and announces the source and availability of this information. Whereas the literature of science is emphasized, coverage is extended to DOE programmatic, socioeconomic, environmental, legislative/regulatory energy analysis, and policy-related areas. To accomplish this mission, the Center builds and maintains computerized energy-information data bases and disseminates this information via computerized retrieval systems and announcement publications such as abstracting journals, bibliographies, and update journals. Direct access to the Center's most comprehensive data base, the Energy Data Base, is available to the public through commercial on-line bibliographic retrieval systems. The Energy Data Base and many of the Center's energy-related data bases are available to DOE offices and contractors and to other government agencies via DOE/RECON, the Department's on-line information retrieval system. The Center has developed and maintains systems to record and communicate energy-related research-in-progress information, to catalog official DOE issue-and-policy documents, to maintain a register of DOE public communications publications, to track research report deliverables from DOE contractors, and to test and make available DOE-funded computer software programs with scientific and management applications. The Center also maintains a full-scale publishing capability to serve special publication needs of the Department. To effectively manage DOE's technical information resources, the Center's program is one of continual development and evaluation of new information products, systems, and technologies.

ABOUT *ENERGY ABSTRACTS FOR POLICY ANALYSIS*

Energy Abstracts for Policy Analysis (EAPA), while embracing all phases of energy analysis and development, is limited primarily to nontechnological or quasitechnological articles or reports having significant reference value. This selectivity in scope and coverage of *EAPA* is effected to emphasize the following: programmatic efforts; policy, legislative, and regulatory aspects; social, economic, and environmental impacts; regional and sectoral analyses, institutional factors, etc. *Note:* the "hard" scientific and technical literature is abstracted for the most part in DOE *Energy Research Abstracts (ERA)* and is included in the DOE Energy Data Base.

Selection for *EAPA* is based strictly on content (substantive articles) and is made from Congressional committee prints; Federal agency and department reports; regional commission and state and local government reports; periodicals, including trade journals and newsweeklies; conference proceedings and/or conference papers; books, including manuals, directories, encyclopedias, etc.; and documents from industrial firms, private institutes and foundations, educational institutions, societies, associations, etc.

EAPA is available on an exchange basis to universities, research institutions, industrial firms, and publishers of energy information. Inquiries should be directed to the Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830.

EAPA is available to the public on a subscription basis from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. The subscription rate for the 12 monthly issues plus the annual index is $70.00 for domestic subscribers and $87.50 for subscribers outside the North American Continent. The annual index is also available separately to subscribers for $10.00 (domestic) or $12.50 (outside the North American Continent). A single issue costs $6.00 (domestic) or $7.50 (outside the North American Continent).

Published by the United States Department of Energy, Technical Information Center
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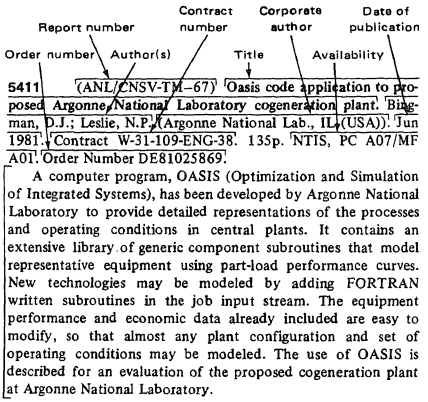
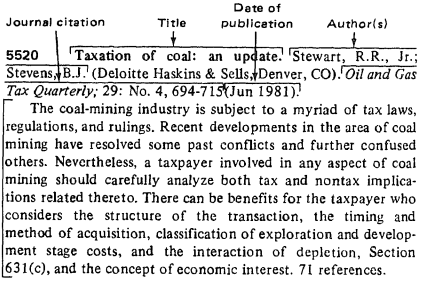
HOW TO USE *ENERGY ABSTRACTS FOR POLICY ANALYSIS*

ABSTRACTS IN *ENERGY ABSTRACTS FOR POLICY ANALYSIS*

The principal elements of abstract entries for a typical research and development report and a typical technical journal article are illustrated below.





INDEXES TO *ENERGY ABSTRACTS FOR POLICY ANALYSIS*

Four indexes are provided for approaching the contents of each issue of *Energy Abstracts for Policy Analysis (EAPA)*. These indexes are cumulated annually. Each index is preceded by an introduction that details the organization of the index and the principles by which it was compiled. The reader is referred to these introductions for information not found in the index examples that follow.

•Corporate Author Index

Technical report literature is indexed using the name of the organization or institution responsible for the issuance of the report.

Argonne National Lab., IL (USA)
Near-term goals for alcohol fuels from biomass: an overview of resource requirements, land use, environmental, and socio-economic impacts, 7:5638 (ANL/EES-TM-149)
Oasis code application to proposed Argonne National Laboratory cogeneration plant, 7:5411 (ANL/CNSV-TM-67)

•Personal Author Index

Each author's name is indexed in the form appearing on the document abstracted, with the exception that given names are reduced to initials:

Bingman, D.J., Oasis code application to proposed Argonne National Laboratory cogeneration plant, 7:5411 (ANL/CNSV-TM-67)
Leslie, N.P., *See* Bingman, D.J., 7:5411
Stevens, B.J., *See* Stewart, R.R. Jr., 7:5520
Stewart, R.R. Jr., Taxation of coal: an update, 7:5520

•Subject Index

The subject index consisting of entries naming specific concepts, objects, and materials is arranged alphabetically. Document titles, informative phrases, or both specific to these entries are arranged alphabetically under the entries. Pertinent cross references are included.

COAL INDUSTRY
  Taxes
    Taxation of coal: an update, 7:5520
COMPUTER CODES
  O Codes
    Oasis code application to proposed Argonne National Laboratory cogeneration plant, 7:5411 (ANL/CNSV-TM-67)
DUAL-PURPOSE POWER PLANTS
  Computerized Simulation
    Oasis code application to proposed Argonne National Laboratory cogeneration plant, 7:5411 (ANL/CNSV-TM-67)

•Report Number Index

Technical report literature is also indexed by report numbers. This index includes information on where individual reports may be obtained. Patents and conference papers are indexed here as a matter of convenience. When a report is supplied under an Order Number, that number is included in the availability statement. An Order Number Report Number Correlation is included for convenience.

ANL/CNSV-TM-67	7:5411	NTIS, PC A07/MF A01. Order Number DE81025869, Distribution Category MN-95d

SUBJECT CONTENTS (NUMERICAL LISTING)

Six-digit subject category numbers are used in the storage, retrieval, and manipulation of bibliographic information entered into DOE's computerized bibliographic information system. The six-digit category numbers are utilized as if they were three pairs of two-digit numbers, the first two pairs being used to arrange the abstract content of *Energy Abstracts for Policy Analysis.* Because each issue of *EAPA* announces only those documents becoming available during a monthly period, some subject categories may not be represented in every issue.

SUBJECT CONTENTS (ALPHABETICAL LISTING)

Six-digit subject category numbers are used in the storage, retrieval, and manipulation of bibliographic information entered into DOE's computerized bibliographic information system. The six-digit category numbers are utilized as if they were three pairs of two-digit numbers, the first two pairs being used to arrange the abstract content of *Energy Abstracts for Policy Analysis.* Because each issue of *EAPA* announces only those documents becoming available during a monthly period, some subject categories may not be represented in every issue.

Abstract No. 5179 was intentionally omitted.

ENERGY ABSTRACTS FOR POLICY ANALYSIS

29 GENERAL

5040 (AFMD—81-40) Millions wasted trying to develop major energy information system. (Comptroller General of the United States, Washington, DC (USA)). May 1981. 81p. NTIS, PC A05/MF A01.

A Federal energy information system created to improve Federal and State energy regulation by providing computerized access to current energy data is reviewed. It is concluded that the system failed because management deficiencies existed in planning, development, and implementation. Moreover, the cost and progress of the system was not monitored. Poor communication among system developers and intended users at the Federal and State levels, lack of continuous involvement and support from top Federal management, and disruptions in both organization and personnel are also cited as reasons for the system's failure.

5041 (DOE/IR/11132—1) Conceptual framework for energy education, K-12. (Enterprise for Education, Santa Monica, CA (USA)). May 1982. Contract AP01-80IR11132. 136p. NTIS, PC A07/MF A01. Order Number DE82020151.

After a brief statement of the goals of energy education, the concept of energy literacy is loosely defined and two ways are identified by which energy education can be introduced into school curricula. A number of related generalizations are identified that might form the basis for the development of energy curricula, followed in each case by a brief list of selected reference materials. These generalizations include lessons that may be taught on: conversion and measurement of energy, energy flow in the biosphere, human use of energy, energy history of the United States, energy from fossil fuels, nuclear reactions, and solar technologies, electricity as an energy carrier, economic and financial aspects of energy use, ethical issues in energy use, conservation of energy, shelter-related energy conservation, and transportation conservation. Some sample objectives are given that might be considered for use at various grade levels in a typical sequence, with widely used texts accompanying each example. 607 references. (LEW)

5042 (DOE/MA—0081) DOE training evaluation guide. (USDOE Assistant Secretary for Management and Administration, Washington, DC. Employee Development and Training Div.). Oct 1982. 41p. NTIS, PC A03/MF A01. Order Number DE83000150.

Since the inception of DOE, the Employee Development and Training Division and field training offices have sought to deliver quality training designed to meet Departmental needs as well as the career development needs of DOE employees. An essential feature of this activity is the development of an evaluation system that provides feedback to assess program effectiveness, identifies deficiencies, if any, and makes appropriate improvements or modifications. Properly used, an evaluation system can help ensure that training is dynamic and responsive to the needs of the organization (DOE). The Employee Development and Training Division, Office of Personnel, has devised this guide to be used, in whole or in part, as deemed appropriate by the responsible training office, to promote the development of effective training evaluation techniques and an ongoing training evaluation system.

5043 (DOE/S—0010-82) Secretary's annual report to Congress. Secretary's statement, program review, and outlook. (USDOE Office of the Secretary, Washington, DC). Aug 1982. 176p. NTIS, PC A09/MF A01. Order Number DE82021878.

This report covers activities of all elements of the Department of Energy except the independent Federal Energy Regulatory Commission, which issues its own annual report. This report is supplemented by three annexes: (1) The Fifth Report to Congress - Comprehensive Program and Plan for Federal Energy Education, Extension, and Information Activities (Published December 1981 by the Office of State and Local Programs, Office of Conservation and Renewable Energy, US Department of Energy); (2) Third Annual Report to Congress on the Automotive Technology Development Program (Published February 16, 1982, by the Office of Vehicle and Engine Research and Development, Office of Conservation and Renewable Energy, US Department of Energy); and (3) Observations and Recommendations on the Future of the Energy Extension Service Program: Fourth Report by the National Energy Extension Service Advisory Board (Published January 1982 by the Office of State and Local Programs, Office of Conservation and Renewable Energy, US Department of Energy).

5044 Productivity measures for energy management. Turner, W.C.; Tompkins, B.W. (Oklahoma State Univ., Stillwater). *American Institute of Industrial Engineers, Detroit Chapter, Proceedings of the Annual Conference;* 59-66(1981). (CONF-810538—). Detroit, MI, USA (17 May 1981).

An examination is made of energy productivity monitoring and control measurement systems. The indices of Btu unit of production, Btu/square foot of conditioned space, and Btu/direct labor hour are all examined. Then some rather unique or new ideas are presented and discussed. Suggestions are made for designing effective energy productivity measurement systems. Next, energy cost accounting is discussed; cost center metering, and it's cost effectiveness are presented. Suggestions are made for evolving toward effective energy metering. Particular emphasis is given to what utility should be metered and where the metering should occur. Concluding the paper are various companies' experiences with monitoring and measuring the productivity of energy resources.

2901 Energy Analysis And Modeling

REFER ALSO TO CITATION(S) 5070, 5096, 5265

5045 (ANL/CNSV—30) Disaggregating input-output models. Wolsky, A.M. (Argonne National Lab., IL (USA)). Feb 1982. Contract W-31-109-ENG-38. 31p. NTIS, PC A03/MF A01. Order Number DE82021268.

A general solution is given to the problem: with little computation, construct a more disaggregated input-output model from an available model, using information about some activities that were aggregated when the available model was built. The solution is exact and explicit. Concomitant approximate solutions, with error bounds, are also given. When only partial information is available, the exact solution guides its user to inexpensive and precise sensitivity analysis. Detailed consideration is accorded to the solution of the most frequently occurring problem - the disaggregation of one sector into two.

5046 (CONF-810842—7) Energy-data validation: an overview and some concepts. Loebl, A.S.; Cantor, S. (Oak Ridge National Lab., TN (USA)). 1981. Contract W-7405-ENG-26. 18p. NTIS, PC A02/MF A01. Order Number DE82020901.

From American Statistical Association meeting; Detroit, MI, USA (10 Aug 1981).

Portions of document are illegible.

Energy data validation can be viewed operationally as a three-fold assessment process: (1) a determination of the quality of the data collected, i.e., an assessment of accuracy; (2) an analysis of the relevance and usefulness of the data so as to assess how closely the data collected is meeting the requirements of its users; (3) an assessment of measures that can be taken to enhance the effectiveness of the data system under study. Assessment (1) is akin to the process of critical evaluation of data in the physical sciences. Assessments (2) and (3), the more distinctive features, underlie two important goals of validation. In brief, the analyst validates both the information and the requirements for the information, and as deficiencies in these two aspects are uncovered, the validation analyst formulates and evaluates the means for correcting these deficiencies. This paper focuses upon the use of an error model for systematizing the assessment of accuracy in a data-system validation study. Other topics discussed briefly are: a capsule history of energy-data validation; ORNL studies of outlier detection methods, automatic data editing and sampling theory in support of the energy-data validation program; reviews of energy-data requirements.

5047 **(DOE/EIA/11873—T2) Requirements study concerning ADP and data communications for EIA. Report No. 2. Projected ADP requirements. Final report.** (Analytic Systems, Inc., Vienna, VA (USA); CAP Gemini, Inc., Vienna, VA (USA)). 6 Oct 1981. Contract AC01-81EI11873. 155p. NTIS, PC A08/MF A01. Order Number DE82020638.

This study updates the previous projections of FY 1982 automatic data processing needs and lists FY 1983/FY 1984 trends. Efforts focus on workload requirements, special hardware/software, and operational needs. (PSB)

5048 **(EUR—6756-FR) Implementation of EEC models for Belgium: energy-demand models.** Cherif, M.; Guillaume, Y.; Rouland, O. (Brussels Univ. (Belgium). Dept. d'Economie Appliquee). 1980. 52p. (In French). European Community Information Service, 2100 M Street NW, Washington, DC 20037. Order Number DE82902712.

Portions of document are illegible.

A description is given of macroeconomic models, sectional input-output and energy demand models. Also discussed is the philosophy of the central variant, including study techniques, model modifications, improvements. Also presented are various scenarios predicted by various models with respect to petroleum prices, energy demand, the effect of higher TVA rates on energy consumption, and modifications of export structure. 3 references, 13 tables.

5049 **(EUR—7779-EN) Energy economy of the Netherlands as part of the European Community's linear energy model.** Droste, F.P.M. (Technische Hogeschool Twente, Enschede (Netherlands)). 1982. 121p. European Community Information Service, 2100 M Street NW, Washington, DC 20037. Order Number DE82906267.

This report describes the Dutch version of the EFOM-12C energy model. Development and utilization of this model to assist in policy analysis and technology assessment, is part of the European Community's energy research program. A case study based on the model is presented in the second part of this report. (PSB)

5050 **(JACKFAU—81-252-2) Development of hybrid I-O tables compatible with the energy-disaggregated input-output (EDIO) model. Final report.** (Faucett (Jack) Associates, Inc., Chevy Chase, MD (USA)). Jan 1981. Contract AC01-79EI10513. 82p. NTIS, PC A05/MF A01. Order Number DE82021283.

Portions of document are illegible.

This report provides the documentation for a project whose primary objective was to incorporate energy consumption Btu data by input-output (I-O) sectors from the National Energy Accounts (NEA) into the 1973 Energy Disaggregated Input-Output (EDIO) Model, thereby creating a Hybrid EDIO for 1973. In addition, two supplemental tasks were undertaken. The first was to compare the techniques used for the valuation of energy products in the Bureau of Economic Analysis (BEA) and NEA I-O systems. The second was to devise a methodology that could be used to project the Hybrid EDIO Table for 1973 to 1985 and 1990. The report is divided into three parts which reflect the above three tasks as follows: Insertion of Btus Flow Data into the EDIO Table for 1973; Evaluation of Value Data for Energy Products in the NEA and BEA I-O Tables; and Methodology for the Creation of the Hybrid EDIO Tables for 1985 and 1990.

5051 **Household demand for home heating.** Krumm, R.J. (Univ. of Chicago, IL). *Resources and Energy;* 4: No. 2, 121-144(Jun 1982).

The net benefits of alternative home-heating services. The costs associated with a particular system/fuel alternative can be calculated to determine the relative benefits of alternatives. Using individual household data, empirical analysis of system and fuel adoption in newly constructed housing units indicates that fuel price differences and household-demand characteristics play major roles in the decision process, and that system and fuel choice are not independent. The results suggest that estimates of fuel-and-system adoption patterns based on aggregate data are incomplete and likely to be misleading in the projection of future trends. 4 references, 5 figures, 4 tables.

5052 **New problems of energy supply.** Williams, R.H. (Princeton Univ., NJ). pp 18-35 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

A risk avoidance strategy is outlined for coping with energy shortages and the proposed cost escalation. (PSB)

5053 **Towards negative energy growth: a fuel-conservation Scenario for the United States.** Williams, R.H. (Princeton Univ., NJ). pp 36-65 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

The author orients discussion toward industrialized nations when stressing the importance of energy efficiency in reducing energy consumption. Conventional energy projections along historical growth trends are reviewed. The attention is focussed on opportunities for fuel conservation that would allow present lifestyle to continue with negative energy consumption for the next two to three decades. Statistics are not generalized to global conditions but since the US uses 30% of the world's energy, savings would be significant. (PSB)

5054 **Long-term macroeconomic equilibrium model for the European community.** Rogner, H.H. Laxenburg, Austria; International Institute for Applied Systems Analysis (1982). 88p. (IIASA-RR—82-13).

This report presents a version of MACRO calibrated for the European Community (EC), focusing on model structure, model validation and testing, and four applications to the EC region over a fifty-year planning period. The applications, based on a range of energy supply scenarios, examine such economic questions as the impact of rising energy costs on economic activity, the feasibility of common assumptions about price-induced conservation, and the impact of continued high levels of energy imports on the trade balance. In essence, MACRO describes supply-constrained economic activity, using energy as the constrained input factor. The model is built around a constant elasticity of substitution (CES) production function, which represents substitution processes among capital, labor, and energy. MACRO differs from similar models of energy-economy interactions through its use of explicit factor functions and an empirically based procedure for estimating the CES production function's parameters. To overcome the problem of long-term extrapolations of econometric functions, which were estimated using data from a relatively short sample period, the model concentrates on slowly changing variables, including the capital: output ratio, investment and consumption rates, population, and the labor force. The model also contains exogenously determined scenario parameters, which can be used to countervail short-term trends inherent in the estimated parameters, as well as to simulate policy measures.

5055 **Energy balance of the F.R. of Germany: problems and ways.** Schmitt, D.; Goergen, R. *Zeitschrift fuer Energiewirtschaft;* No. 4, 273-281(Dec 1981). (In German).

In its present form the energy balance of the F.R. of Germany has its origin in a schedule which had been designed more than two decades ago but has been improved since then. Meanwhile there are series reaching back to the year 1950. The energy balance is edited by the AG Energiebilanzen which combines exports' associations of the power industry and the institutes for economics, working entirely for a large part in the field of power economy.

5056 **Mathematical modelling of energy systems.** Kavrakoglu, I. (ed.). Alphen aan den Rijn, Netherlands; Sijthoff and Noordhoff (1981). 486p. (CONF-7906244—). Martinus Nijhoff Publishers BV, 2501 CN - The Hague, The Netherlands, $55.00. Order Number DE82906419.

From NATO Advanced Study Institute conference on mathematical modelling of energy systems; Istanbul, Turkey (9 Jun 1979).

Topics covered include: modelling energy-economy relations; national energy systems; electricity systems modelling; methodology in modelling; cooperation in model implementation; and crude oil pricing mechanism. (GHT)

2902 Economics And Sociology

REFER ALSO TO CITATION(S) 5054, 5097, 5103, 5108, 5109, 5134, 5138, 5139, 5140, 5141, 5142, 5212, 5268, 5303, 5315, 5332, 5337, 5372, 5373, 5417, 5425, 5433, 5446

5057 (CONF-8110215—, pp 27-30) **Land use planning: a League perspective.** Reeves, M.B. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

Policy changes for putting less reliance of solar and renewable energy sources as well as a decreasing emphasis on energy conservation is opposed by public opinion according to this League of Women Voter's speaker. She also discusses the League's position on the Clean Air Act and the expanded use of coal.

5058 (CONF-8110215—, pp 95-104) **Economic impact of taxes on selected eastern coal states.** Nicholson, A.F. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper describes the tax loads and insurance obligations carried by coal producers in three major eastern coal-producing states and suggests how the industry may deal with the existing situations. (PSB)

5059 (CONF-8110215—, pp 105-111) **Impact of fiscal changes on the transportation sector.** Walsh, R.F. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper discusses potential changes in transportation energy efficiency and use which may result from changes in federal policies and programs. Proposed budgetary and tax changes are summarized projected impacts in areas of highways, mass transit, airports, railroad passenger and freight operations, and deep draft and inland waterways. (PSB)

5060 (CONF-8110215—, pp 123-127) **Future of the Illinois coal industry.** Pensoneau, T. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

Technology assessment is reviewed for the coal industry's efforts to solve environmental and safety concerns for combustion uses. The economic stakes are reviewd. (PSB)

5061 (CONF-8110215—, pp 134-137) **Impact of shifting energy policies on the Illinois consumer.** DeWitt, S.P. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The rise of consumer fraud schemes for those interested in saving energy and money is rising exponentially with the fuel shortages. Illinois' efforts in protecting the consumer are described. (PSB)

5062 (CONF-8110215—, pp 162-167) **Progress report on federal energy policy.** Cook, J.O. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper assesses the progress of the federal energy policy, the direction it's taking and the effects projected for Illinois, especially for the coal industry. (PSB)

5063 **(DOE/CS/30013—U10) Residential utility rate guide for SOLCOST data bank cities, Winter 1981-1982.** Lambert, S. (Alabama Univ., Huntsville (USA). Kenneth E. Johnson Environmental and Energy Center). 1982. Contract FG01-79CS30013. 639p. NTIS, PC A99/MF A01. Order Number DE82020563.

Portions of document are illegible.

The SOLCOST program is a systems analysis program of the Department of Energy. This program allows a new simplified design method for residential and light commercial solar heating and cooling. SOLCOST can also provide optimum size and performance characteristics for solar heating, cooling and service hot water systems, including cost comparisons between solar and conventional systems. It also performs heat load analysis for buildings and can be used for comparative energy and economic analyses for various geographic regions and for different heating, ventilation and air conditioning (HVAC) systems and energy alternatives. The current residential utility rate for the location being considered is one of the parameters needed for the SOLCOST design method. The document gives the residential rates for electricity and natural gas for each city. It shows company name, customer and minimum charges, the fuel cost adjustment, taxes, surcharges, and the date which the data is current. Rate structures for each company are shown as quoted by that company. Computations have been made for each step showing the total without charges and taxes, the total with charges and taxes, the cost per kilowatt-hour or cubic foot, and the cost per million Btu with charges and taxes. The user must be aware of some unusually high costs-per-unit when considering rates for low consumptions. These rates can be misleading due to the addition of customer or additional charges.

5064 **(DOE/CS/30013—U11) Residential energy costs for SOLCOST data bank cities, Winter 1981-1982.** Holder, R.R. (Alabama Univ., Huntsville (USA). Kenneth E. Johnson Environmental and Energy Center). 1982. Contract FG01-79CS30013. 145p. NTIS, PC A07/MF A01. Order Number DE82020560.

The SOLCOST program is a systems analysis program of the Department of Energy. This program allows a new simplified design method for residential and light commercial solar heating and cooling. SOLCOST can also provide optimum size and performance characteristics for solar heating, cooling and service hot water systems, including cost comparisons between solar and conventional systems. It also performs heat load analysis for buildings and can be used for comparative energy and economic analyses for various geographic regions and for different heating, ventilation and air conditioning (HVAC) systems and energy alternatives. The current residential utility rate for the location being considered is one of the parameters needed for the SOLCOST design method. The document gives the residential rates for electricity and natural gas for each city. It shows company name, customer and minimum charges, the fuel cost adjustment, taxes, surcharges, and the date which the data is current. Rate structures for each company are shown as quoted by that company. Computations have been made for each step showing the total without charges and taxes, the total

with charges and taxes, the cost per kilowatt-hour or cubic foot, and the cost per million Btu with charges and taxes. The user must be aware of some unusually high costs-per-unit when considering rates for low consumptions. These rates can be misleading due to the addition of customer or additional charges.

5065 **(ENEA-RT-EC—82-1) Substitution between production factors: a translog sectoral model.** Rinaldi, A.I. (Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale Studi dell'Energia Nucleare e delle Energie Alternative (ENEA)). 1982. 150p. (In Italian). NTIS (US Sales Only), PC A07/MF A01. Order Number DE82906297.

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The paper describes a methodology for the analysis of the substitution between several inputs in production. The factor substitution theory is outlined; the characteristics of translog production and cost functions are examined. Finally, an econometric estimate of inter-energy substitution for several sectors of Italian manufacturing is presented.

5066 **(PB—82-109901) Coal-Cooperative Efficiency Program: small-mine operations. Final report.** Multcher, J. (Berger Associates, Harrisburg, PA (USA)). Sep 1980. 315p. (ARC—77-203-5897). NTIS. Order Number DE82905272.

Portions of document are illegible.

This study researched the concept of small coal operators combining to form coal cooperatives as a means of providing services and to improve their economic position in coal markets. A small-coal-operators attitude survey was completed in Appalachia, along with actual interviews of numerous operators in two case-study areas - Clearfield, Pennsylvania, and Beckley, West Virginia. A profile of small-operator facilities and operations was developed along with suggested coal-cooperative configurations in the two case-study areas. A general administrative services co-op was suggested for the Beckley area and a capital-intensive coal processing/transloading co-op for the Clearfield area. From a review of the vast experience in US agricultural cooperatives, a step-by-step procedure for forming a coal co-op is detailed from the idea stage to the first Board of Director's meeting. An extensive economic analysis is included to demonstrate potential member benefit-costs. Recommendations are made to operator, state, regional and federal sectors to develop demonstration coal cooperatives to further prove out the concept.

5067 **(PB—82-185331) Behavioral and social aspects of energy consumption and production: preliminary report.** (National Academy of Sciences - National Research Council, Washington, DC (USA)). Mar 1982. 74p. NTIS, PC A04/MF A01.

This report identifies thirteen areas in which the behavioral and social sciences, in particular the noneconomic disciplines, may make a contribution to energy policy and analysis. It describes three topics from within this set chosen for consideration in the project's second year. One topic, the behavior of energy consumers, receives detailed discussion. Five conceptions of the energy consumer are described, each of which contains some validity. The report discusses some implications of the facts that energy consumers imitate and are influenced by their associates, that behavior has a momentum of its own aside from notions of rationality, and that energy consumption is influenced by personal values and norms. The report also emphasizes certain features of the environment in which energy consumers operate, including historical factors that make energy invisible to most consumers, the assurance that consumers will receive conflicting, confusing, and inaccurate information about energy, the symbolic meanings that have been associated with energy use, the limitations on consumer choice about energy use, and the conflict between the value of efficiency and values of equity and flexibility in the energy system. An appendix presents preliminary thoughts about a second topic, preparation and response in energy emergencies.

5068 **Public-utility rate-design survey by states.** Kamerschen, D.R.; Stark, P.L. (Univ. of Georgia, Athens). *Public Utilities Fortnightly;* **110**: No. 2, 46-47(22 Jul 1982).

A telephone survey of state regulatory commissions found that 11 states use marginal-cost pricing and eight states use the Ramsey inverse-elasticity rule. Most respondents were unfamiliar with the Ramsey concept, which differs from cross-price elasticity by stating that deviations from marginal-cost in a multiproduct firm depend on price elasticities of demand. 1 table. (DCK)

5069 **Managerial objectives subject to political market constraints: electric utilities in the US.** DiLorenzo, T.J.; Robinson, R. *Quarterly Review of Economics and Business;* **22**: No. 2, 113-125(Sum 1982).

The economics of property rights maintains that publicly-owned firms are inherently less efficient than privately-owned firms because public-sector managers are not constrained by capital markets. Public managers are, however, induced at times to minimize cost by political pressure. The effects of political competition may partly reduce the inherent inefficiencies of public firms. The article compares the behavior of public and private firms in the electric-utility industry in the areas of price discrimination and production efficiency. It is found that political competition may partly alleviate inherent inefficiencies of public firms and that equivalent degrees of price discrimination exist. 20 references, 6 tables.

5070 **Analytic foundation of international economic modeling at the OECD.** Llewellyn, G.E.J.; Samuelson, L.W. (Organization for Economic Cooperation and Development, Paris, France). *Journal of Policy Modeling;* **4**: No. 2, 261-273(Jun 1982).

This article describes the OECD Secretariat's international linkage model, INTERLINK, built to assist various tasks, including the production of baseline international projections, the establishment and maintenance of international consistency of these projections, and the production of alternative projections and policy scenarios. It is thus concerned with the theory of the method of international forecasting and policy analysis, rather than the theory of forecasting itself. The article is divided into sections, which discuss the reasons for international economic modeling at OECD, the main tasks performed by the model, the technical requirements that it needs to satisfy, its present structure, and the experience with it. 16 references, 1 table.

5071 **Measuring the benefits of air quality improvements: a hedonic salary approach.** Bayless, M. (General Motors Inst., Flint, MI). *Journal of Environmental Economics and Management;* **9**: No. 1, 81-99(Mar 1982).

This paper estimates the compensating variation associated with nonmarginal changes in air quality using a hedonic salary model and 1970 data collected for a national sample of university professors. Recent advances in the theory of hedonic prices are utilized in constructing the theoretical model and formulating a procedure for generating empirical estimates. Lower bound estimates of the compensating variation associated with a one standard deviation increase in total suspended particulates (27.6 mgs/cu. meter/24 hours) were $419 for full professors, $234 for associate professors, and $209 for assistant professors in 1970. These results were not sensitive to the specification of the hedonic salary equations.

5072 **Economic assessment of air pollution damages to selected annual crops in southern California.** Adams, R.M.; Crocker, T.D.; Thanavibulchai, N. (Univ. of Wyoming, Laramie). *Journal of Environmental Economics and Management;* **9**: No. 1, 42-58(Mar 1982).

Agricultural production is influenced by many factors beyond the control of individual producers. In recent decades, air pollution has become one of these exogenous factors. This study uses a price-endogenous mathematical programming model to assess the economic benefits of reducing 1976 ambient oxidant exposures of 14 annual crops in southern California. A measure of the distributional consequences of these benefits across producers, consumers and locations is also provided. Results indicate that 1976 benefits of control for the fourteen included crops would have been approximately $46 million.

5073 **Basic research and its impact on technology.** Luest, R. *Maschinenschaden;* **55**: No. 3, 159-167(1982). (In German).

This paper provides a historical outline of the varied and continuous problem of pure striving for knowledge and practical technical actions, from free research and technical commercialisation. A number of striking examples illustrate the scarcely foreseeable 'radical change' from basic research to significant commercial applications (astrophysics - nuclear fusion; organometallic compounds - production of plastics; nuclear fission - nuclear energy; biochemistry - breeding research). The paper illustrates the clear links between research tasks in the ACT and a number of Max Planck Institutes and discusses the necessity of technology transfer. The increasing responsibility borne by scientists and politicians in highly industrialised societies, i.e. the basic question of professional ethics in our technologically characterised civilisation, is again dealt with.

5074 **Role of common-property resources in optimal planning models with exhaustible resources.** Kamien, M.I.; Schwartz, N.L. (Northwestern Univ., Evanston, IL). pp 47-71 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 2 reviews the state of economic theory in the areas of capital, exhaustible resources, and pollution, while focusing on the literature that accommodates pairs of features. It outlines a program of research that can be followed to gain insights on optimal aggregative planning in the presence of both exhaustible extractive resources and common-property environmental resources. 59 references.

5075 **Use of common-property resources.** Heal, G. (Essex Univ., Colchester, England). pp 72-106 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 3 selectively reviews some of the economic issues associated with the use of free access or common-property goods such as air, oceans, fisheries, etc. It focuses mainly on two types of material: (1) issues out of which policy recommendations emerge nationally, and (2) areas where it seems that the state of received theory is weak. The first section reviews the classic deterministic common-property problem and analyzes various proposals for institutional changes to deal with its over exploitation. Section 2 notes the limitations in available information about the long-run macrodynamics of many common-property resources under free access and single ownership. The problem of optimal management of consumption-linked pollution in an environment with a limited capacity to degrade pollution suggests the need for further research. 29 references, 12 figures.

5076 **Perceived role of materials in neoclassical models of production technology.** Kopp, R.J. (Resources for the Future, Inc., Washington, DC); Smith, V.K. pp 201-244 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 7 reports the findings of a series of experiments conducted to appraise the usefulness of neoclassical economic models for measuring the degree of factor substitution possible in production activities. Large-scale engineering-process-analysis models of iron and steel production were used to evaluate the effects of the following on substitution possibilities: (1) the definition of natural resource inputs, (2) the qualitative features of the engineering technology, and (3) the presence of exogenous constraints on economic optimization (i.e., cost minimization). The findings question the measured prospects for materials substitution using an aggregate input. Efforts to disaggregate both the industry and the character of the materials inputs have greater prospects for success, but may still be at too high a level of input aggregation to effectively determine the limits to input substitution that are imposed by physical laws in the underlying technologies. 59 references, 2 figures, 15 tables.

5077 **Effects of regulation on utility financing: theory and evidence.** Taggart, R.A. Jr. Cambridge, MA; National Bureau of Economic Research, Inc. (1982). 45p. National Bureau of Economic Research, 1050 Massachusetts Ave., Cambridge, MA 02138, $1.50.

This paper examines the financing decisions of regulated public utilities. It is argued that the regulatory process affects utility-financing choices both by conditioning the environment in which these choices are made and by creating opportunities for firms to influence the regulated price through strategic financing behavior. The nature of this regulatory effect continually changes, however, as economic conditions change and as regulators, firms, and consumers adapt to one another's decisions. The direction of the impact on utility financing, therefore, may differ both over time and across regulatory jurisdictions. This theory of regulatory influence is tested by examining several episodes in the financing experience of US electric utilities from 1912 to 1979. Evidence of a regulatory effect on utility financing is found particularly for the early years of state-commission regulation. Examples of an adaptive response pattern on the part of regulators, firms, and consumers are also cited. 43 references, 2 figures, 2 tables.

5078 **Implications of proposed energy taxes. Hearing before the Subcommittee on Fossil and Synthetic Fuels of the Committee on Energy and Commerce, House of Representatives, Ninety-Seventh Congress, Second Session, June 15, 1982.** Washington, DC; Government Printing Office (1982). 295p. GPO.

While proposed energy taxes are designed to increase revenues, the 13 witnesses to a hearing on these proposals noted a variety of implications to some of the proposals. Their responses suggest the need for a comprehensive tax policy to ensure that the desired effects are achieved. Among the suggestions is a more-equitable replacement for the windfall profits tax, the resolution of conflicting goals in energy-conservation and economic-recovery policies, and the use of taxes as an economic-policy tool. Additional statements and letters submitted for the record follow the testimony. (DCK)

5079 **Impact of energy prices on poor. Hearings before the Subcommittee on Fossil and Synthetic Fuels of the Committee on Energy and Commerce, House of Representatives, Ninety-Seventh Congress, December 7, 1981, and February 10, 1982.** Washington, DC; Government Printing Office (1982). 355p. GPO.

A field hearing in Chicago on the high prices of energy emphasized the special problems of residents in cold-weather areas and the decline in federal assistance to low-income groups. The 17 witnesses represented various consumer groups, utilities, and elected officials. Their testimony is followed by additional material submitted for the record. (DCK)

5080 **Public-private partnership: an opportunity for urban communities.** New York, NY; Committee for Economic Development (1982). 127p. Committee for Economic Development, 477 Madison Avenue, New York, NY 10022 $9.50.

A statement by the Research and Policy Committee of the Committee for Economic Development.

Successful experience with public-private partnerships is the responsibility of civic leaders and organizations. As responsibility shifts back to the local level and the private sector, the potential for cooperation between the public and private sectors should include both the policy and the operational dimensions. There are opportunities for partnership in the local economy, neighborhoods, and key community services. Each of these areas incorporates economic, social, and political factors that are interrelated. If businesses view socio-economic improvements as a self-interest, they will pursue more-active involvement. Local successes, however, will reflect the effectiveness of federal partnerships. 42 references, 2 tables. (DCK)

5081 **Potential impacts of alternative-energy situations on land use and values.** Bhide, S.; Heady, E.O.; Chowdhury, A. (Iowa State Univ., Ames). *Energy in Agriculture;* 1: No. 1, 41-53(Nov 1981).

Dramatic changes in the energy sector during the 1970's with respect to energy price have required adjustments in all other sectors of the economy. The agricultural sector has experienced direct as well as indirect effects of increased energy prices. In this study, the potential impacts of increased energy prices and reduced

supply of energy in the farm sector, on farm land use, and its shadow prices are analyzed. The impacts on dryland use and irrigated land use are compared, as irrigated farming is more energy intensive compared to dryland farming. 20 references, 4 figures, 2 tables.

5082 **Energy-economic analysis and political advice.** Jansen, P.J. *Energiewirtschaftliche Tagesfragen;* **32**: No. 1, 21-26(Jan 1981). (In German).

The Austrian chief analyst of the Inquiry Commission of the German Bundestag shows that the solution of the energy problem cannot any longer be found in the energy field but rather in the economic field and in world politics.

5083 **Folgen reduzierten Wachstums. (Consequences of reduced economic growth).** Stuttgart, Germany, F.R.; Kohlhammer (1981). 181p.

In a compendium-like manner the authors deal with the economic, social and political issues resulting from a reduced growth. The articles are entitled: Lasting weakness of growth. Zero-growth: unavoidable or even wished-for. How does the decrease in population influence the economic development. The effects on regional economic structures. Full-time employment in spite of reduced growth. Effects on the policy of the tariff parties. The government confronted with serious financial problems. System of social security endangered. Sinking level of prosperity. Pollution protection and economic growth in conflict. Why a governmental policy of growth.

5084 **Scheduling and the energy economics of wall design.** Kennedy, W.J. Jr.; Turley, R.E. (Univ. of Utah, Salt Lake City). *American Institute of Industrial Engineers, Detroit Chapter, Proceedings of the Annual Conference;* 81-83(1981). (CONF-810538—). Detroit, MI, USA (17 May 1981).

A model is presented for use in comparing the energy consumption of various building construction types under two different work schedules. The model is general enough that it can be adapted to many different kinds of building construction; the input parameters are adaptable to the evaluation of many kinds of scheduling and many different possible combinations of unoccupied temperature settings. For the purposes of this analysis a manufacturing facility was selected which was patterned after a case study entitled Artos Company Manufacture of a Folding Step Stool. The analytical model used was the standard ASHRAE methodology for heating and cooling load calculations, combined with a procedure for computing solar heat loads.

5085 **Canada and Mexico: the comparative and joint politics of energy.** Feldman, E.J.; Costain, W.D.; Hampson, F.; McKinsey, L. Cambridge, MA; University Consortium for Research on North America (1981). 76p. (CONF-8104175—Summ.). Univ. Consortium for Research on North America, 1737 Cambridge St., Cambridge, MA 02138 $3.25. Order Number DE82906100.

From Joint Canadian/Mexico symposium on comparative and joint politics of energy; Boston, MA, USA (9 Apr 1981).

Topics covered at the symposium include: the national energy policies; political constraints on national policies; the production of electricity, potential for international cooperation; oil, gas, and synthetic fuels, development and exchange; academic views of North America; the future of energy for Canada and Mexico. (GHT)

2903 Environment, Health, And Safety

REFER ALSO TO CITATION(S) 5057, 5060, 5075, 5083, 5132, 5138, 5172, 5173, 5174, 5175, 5182, 5223, 5290, 5300, 5347, 5371, 5391

5086 **(AECL—7404) Risk, fear and public safety.** Siddall, E. (Atomic Energy of Canada Ltd., Sheridan Park, Ontario. Power Projects). Apr 1981. 35p. NTIS (US Sales Only), PC A03/MF A01. Order Number DE82702467.

Part 1 of the paper advocates a rational approach to public safety based on unbiassed quantitative assessment of overall risks and benefits of any technological activity. It shows that improved safety should be attainable at less cost than is the case at present. Part 2 offers an explanation of why so little has been achieved in this direction and outlines the major errors in present practices. Part 3 suggests what might realistically be done towards the achievement of some of the possible benefits. Factors which are important in the study of safety and evidence supporting the arguments are discussed in six appendices. It is urged that the scientific and technological community should improve its understanding of safety as a specialization and should endeavour to lead rather than follow in our present political system.

5087 (CONF-8110215—, pp 31-33) **Land-use planning: a national perspective.** Russell, D. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The author discusses how the Department of Interior approaches land use planning. While the approach is simple the balancing of all societal interests for the same parcel of land is a complex task. In order to optimize that decision making land use regulations are being revised to set a common objective to maximize both economic and social value of the resource base in 3 years as opposed to the current 7 years required by current regulations. (PSB)

5088 (CONF-8110215—, pp 34-38) **Illinois coal and future air quality regulations.** Greene, K. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The author reviews the flaws of implementation of the current Clean Air Act and urges that a pollution budget be enacted for 2 reasons: stimulation of research and development for cleaning high-sulfur coal and for design and efficiency maximization for pollution control technology. (PSB)

5089 (CONF-8110215—, pp 39-42) **Clean Air Act: an attempt to return to balance.** Kontnik, L.T. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The speaker identifies the key legislative issues being debated for proposed modification of the Clean Air Act and comment on Edison Electric Institute's position on each. He urges a long term solution aimed at giving more authority for implementation to the States, especially in emergency energy supply shortages. (PSB)

5090 (CONF-8110215—, pp 43-45) **Long range transport and acid rain.** Semonin, R.G. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This author concludes from a scientific viewpoint that available evidence does not warrant stricter emission requirements than those already in place. He feels resources would be better directed improving scientific knowledge linking presumed precursor sources, acid rain receptors, and effects and ecological systems; only then will accelerated abatement spending be economically sound. (PSB)

5091 (CONF-8110215—, pp 150-154) **Acid rain: its impacts on public health and the environment.** Robinson, R.M. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

International cooperative efforts between US and Canada are reviewed. A continued program is urged in order to minimize both social and environmental impacts. (PSB)

5092 **(DOE/EIS—0094D) Sale of segment O of the Oak Ridge Reservation to the City of Oak Ridge, Tennessee (Proposed site for Tennessee Synfuels Associates coal-to-gasoline facility). Draft environmental impact statement.** (Department of Energy, Oak Ridge, TN (USA). Oak Ridge Operations Office). Aug 1982. 458p. Dept. of Energy, Oak Ridge Operations, Environmental Protection Branch, P.O. Box E, Oak Ridge, TN 37830. Order Number DE82020492.

Portions of document are illegible.

The statement assesses the environmental impacts associated with the sale of approximately 492 hectares (1217 acres) and related easements for industrial development to aid the City of Oak Ridge in achieving economic self-sufficiency as required by the Atomic Energy Community Act of 1955. The City has expressed its intent to sell the site for construction of a plant for the production of 50,000 bpd of liquid fuels (primarily gasoline) from coal using gasification, methanol synthesis, and synthesis of gasoline from methanol. The impacts which would be associated with that plant are also addressed in terms of air quality, solid waste disposal, water quality, noise, terrestrial and aquatic ecology, public and occupational health, socioeconomic conditions, historic resources, aesthetics, transportation, effects of potential accidents, and impacts upon existing DOE facilities in the Oak Ridge area. Significant beneficial economic impacts are projected for increasing employment in the area and through taxes paid to Roane County and the City of Oak Ridge. Potentially significant adverse impacts which have been identified include: odors from hydrogen sulfide in the area near the plant; permanent use of the site for the disposal of waste from the plant; possible risk to groundwater should materials containment fail; noise from the flare during emergencies, upsets, and startup; removal of onsite habitat for plant and animal species; population increases, employment and population fluctuation, and increased demand in a tight housing market; aesthetic degradation due to plant visibility and to illumination and noise from the flare; blockage of Blair Road and noise due to rail transport; traffic increases on TN 58 to over twice capacity during construction of the TSA plant, with resulting congestion, delays and service degradation; and increased risk of fatalities, injuries, and property damage resulting from product transportation accidents.

5093 **(DOE/NBB—0008/1) Status of health and environmental research relative to solid wastes from coal conversion.** Francis, C.W.; Wobber, F.J. (comps.). (Battelle Pacific Northwest Labs., Richland, WA (USA); Los Alamos National Lab., NM (USA); Lovelace Foundation for Medical Education and Research, Albuquerque, NM (USA). Inhalation Toxicology Research Inst.; Oak Ridge National Lab., TN (USA)). Sep 1982. Contract W-7405-ENG-26. 120p. NTIS, PC A06/MF A01. Order Number DE83000036.

This document evaluates the status and makes recommendations about the future needs of health and environmental research relative to solid wastes from coal conversion processes. The objectives are to evaluate the health and environmental implications resulting from solid wastes generated on implementation of a commercial coal synfuel technology and identify research that will elucidate long-term effects of their disposal on human health and environment.

5094 **(EPRI-EA—2538-SR) Solid-waste environmental studies: the needs and the priorities.** Murarka, I.P. (Electric Power Research Inst., Palo Alto, CA (USA). Environmental Assessment Dept.). Aug 1982. 45p. NTIS, PC A03/MF A01. Order Number DE82906490.

This report presents the rationale behind a program of research into the effects of solid wastes disposal on groundwater quality. Problem topics considered are: inorganic heavy metals, other inorganic elements, organic substances, and dissolved substances. Research needs common to all four areas are identified, as are specialized research requirements. The relevant research projects required to meet the electric utility industry's needs during next five years are discussed and ranked in order of importance. A balanced combination of theoretical, laboratory, and field studies of leaching chemistry and soil attenuation factors is recommended for the short term (one to three years). It is expected that these short-term studies will develop the understanding of cause-and-effect relationships necessary to meet the industry's long-term goal of developing geohydrochemical models that can predict the environ fate of contaminants.

5095 **(EPRI-EA—2540-Vol.1) Acid deposition: de framework. Volume 1. Description of conceptual fram and decision-tree models. Final report.** Balson, W.E.; D.W.; North, D.W. (Decision Focus, Inc., Palo Alto (USA)). Aug 1982. 114p. NTIS, PC A06/MF A01. Number DE82906492.

Acid precipitation and dry deposition of acid materials emerged as an important environmental issue affecting the e utility industry. This report presents a framework for the a of decisions on acid deposition. The decision framework is int as a means of summarizing scientific information and uncert on the relation between emissions from electric utilities and sources, acid deposition, and impacts on ecological systems methodology for implementing the framework is that of de analysis, which provides a quantitative means of analyzing de under uncertainty. The decisions of interest include reducti sulfur oxide and other emissions thought to be precursors o deposition, mitigation of acid deposition impacts through such as liming of waterways and soils, and choice of strateg research. The report first gives an overview of the decision work and explains the decision analysis methods with a sim caricature example. The state of scientific information and the eling assumptions for the framework are then discussed f three main modules of the framework: emissions and contro nologies; long-range transport and chemical conversion in mosphere; and ecological impacts. The report then presen versions of a decision tree model that implements the d framework. The basic decision tree addresses decisions on em control and mitigation in the immediate future and a decade and it includes uncertainties in the long-range transport an logical impacts. The research emphasis decision tree addres effect of research funding on obtaining new information as th for future decisions. Illustrative data and calculations using cision tree models are presented.

5096 **(GAO/PART—82-1) Report to the Presider the Congress. Performance evaluation of the Energy In tion Administration, Department of Energy.** (Genera counting Office, Washington, DC (USA). Profes Audit Review Team). 19 May 1982. 61p. NTIS, PC MF A01 - Professional Audit Review Team, Room 3 Indiana Ave. NW, Washington, DC 20001. Order N DE82905231.

This report discusses the results of the Professional Review Team's annual evaluation of the performance Energy Information Administration (EIA), as required by t partment of Energy Organization Act (Public Law 95-91 August 4, 1977). The report addresses major funding and reductions in EIA's activities and evaluates EIA's perform functions that are central to its capability to effectively perf role. Accordingly, the report should be useful in delib energy information issues in the context of their current ope environment.

5097 **(LA—9458-T) Economic and regulatory eff in air-pollution control.** Kolstad, C.D. (Los Alamos N Lab., NM (USA)). Jul 1982. Contract W-7405-E 258p. NTIS, PC A12/MF A01. Order N DE82021149.

Thesis. Submitted to Stanford Univ., CA.

This dissertation provides a bridge between oversi analyses of regulatory alternatives and undersimplified per of the air pollution problems by regulators. Some of the m cal realistic aspects of air pollution such as time-varying transport, locational aspects of pollution control, demand f jointly produced with pollution, and uncertainty are discus timal levels and distribution of pollution as well as the effi alternate regulatory structures in achieving optimality are

5098 **(LBL—14496) Energy sources and climate.** Calvin, M. (Lawrence Berkeley Lab., CA (USA)). 27 May 1982. Contract AC03-76SF00098. 15p. NTIS, PC A02/MF A01. Order Number DE82020612.

An analysis is made of the existing data on the effect of the use of fossil carbon as an energy source over the last two centuries on the atmospheric composition of the earth. It is concluded that there is a set of independent observations which, taken together, make likely a global climatic change as a result of the increased carbon dioxide level from these fossil energy sources. Alternative sources are recommended.

5099 **(PNL—4384-Exec.Summ.) Analysis of methods and models for assessing the direct and indirect economic impacts of CO_2-induced environmental changes in the agricultural sector of the US economy.** Callaway, J.M. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1982. Contract AC06-76RL01830. 28p. NTIS, PC A03/MF A01. Order Number DE83000070.

Portions of document are illegible.

Alternative methods for quantifying the economic impacts associated with future increases in the ambient concentration of CO_2 were examined. A literature search was undertaken, both to gain a better understanding of the ways in which CO_2 buildup could affect crop growth and to identify the different methods available for assessing the impacts of CO_2-induced environmental changes on crop yields. The second task involved identifying the scope of both the direct and indirect economic impacts that could occur as a result of CO_2-induced changes in crop yields. The third task then consisted of a comprehensive literature search to identify what types of economic models could be used effectively to assess the kinds of direct and indirect economic impacts that could conceivably occur as a result of CO_2 buildup. Specific attention was focused upon national and multi-regional agricultural sector models, multi-country agricultural trade models, and macroeconomic models of the US economy. The fourth and final task of this research involved synthesizing the information gathered in the previous tasks into a systematic framework for assessing the direct and indirect economic impacts of CO_2-induced environmental changes related to agricultural production.

5100 **(USGS-OFR—81-1249) Permit requirements for development of energy and other selected natural resources for the State of Alaska.** (Geological Survey, Washington, DC (USA)). Aug 1981. 102p. Geological Survey, Open File Service, Denver Federal Center, Box 25425, Denver, CO 80225. Order Number DE82905271.

This guidebook summarizes environmental and land-use permits issued by the State for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of Federal, State, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5101 **Acid rain regulators shift into low gear.** DeYoung, H.G. *High Technology;* 2: No. 5, 82-86(Sep-Oct 1982).

Despite new information on the effects of acid rain, the administration is asking for more research before proceeding with environmental controls. Studies linking acid rain with fish kills, heavy metals in soils, corrosion, and other manifestations date to the late 19th century. Supporters of strict pollution laws point out that knowing all the facts and interrelationships is elusive. They blame economic and political expedience, yet note that the administration is taking large risks in its economic and foreign policies that it isn't willing to take in environmental policy. A challenge from Canada, which plans to reduce its pollution by one half, may force administration response if it is tied in with electric power and natural gas exports to the US. (DCK)

5102 **Asbestos health problems force insulation removal.** Fleming, J. *Energy User News;* 7: No. 32, 1, 7-8(9 Aug 1982).

Employee health concerns linked to asbestos insulation at industrial facilities will require costly containment or removal. Although the 15,000 pending lawsuits target 250 manufacturers and vendors, building owners and managers foresee possible liability in the future because of prior knowledge that the material may cause inflammation or cancer of the lungs after inhalation over a period of time. At least five of the nine major manufacturers no longer make asbestos insulation. Cost estimates for abatement range from $2.00 to $20 per square foot for treating and encapsulating the material or disposing of its. No decision has been made on who is financially responsible for the costs. A directory lists 81 suppliers of industrial insulation. (DCK)

5103 **New job for businessmen: managing the company's environmental resources.** Bodily, S.E.; Gabel, H.L. *Sloan Management Review;* **23**: No. 4, 3-18(Sum 1982).

In early 1979, the bubble concept of environmental control became public policy. This article describes the economic logic of the new environmental policies and identifies the additional responsibilities facing managers. A steel mill is used as a prototype to demonstrate how the decisions required by these policies can be made using optimization methods and models. 17 references, 1 figure, 4 tables.

5104 **Comparative tumor-initiating activity of complex mixtures from environmental particulate emissions on SENCAR mouse skin.** Nesnow, S.; Triplett, L.L.; Slaga, T.J. (U.S. Environmental Protection Agency, Research Triangle Park, NC). *Journal of the National Cancer Institute;* **68**: No. 5, 829-834(May 1982).

The value of the SENCAR mouse for testing tumorigenic properties of complex mixtures on mouse skin was studied. Seven complex mixtures were obtained as dichloromethane extracts of collected particulate emissions from three diesel-fueled automobiles, a heavy-duty diesel engine, a nonleaded gasoline-fueled automobile, a coke oven battery, and a roofing tar pot. These emissions were applied topically at multiple doses to both male and female SENCAR mice that were subsequently promoted with 12-O-tetradecanoylphorbol 13-acetate. Two statistical analyses were applied to the data to rank the samples and to provide 95% confidence intervals. One analysis used tumor multiplicity data, applied them to a nonlinear Poisson model, and the second analysis used tumor incidence data and applied them to a log-probit model. Both analyses ranked the complex mixtures in similar order. Benzo[a]pyrene content alone could not account for all the tumorigenic activity in each complex mixture, indicating that other components also contribute to the overall tumorigenic activity.

5105 **Die Haftung fuer Schaeden durch Umweltchemikalien. (Liability for pollution damage caused by chemicals).** Nawrath, A. Frankfurt am Main, Germany, F.R.; Lang (1982). 268p.

The author tries to analyze the structures and the efficiency of the existing pollution regulations in case of pollution damages caused by chemicals after the regulations for chemicals have been constituted as a special legal sector reaching beyond the previous media - related regulations by the pollution law passed at the end of the last legislative period. He defines the characteristics of the legally relevant sector endangered by pollutants and differentiates them as against other risks of chemicals. Then he investigates the existing regulations for damages with the help of the respective material risks, controlled environmental media, pollution sources, as well as pollutant and damage types included, what kind of risk by polluting agents they deal with and how they attribute the damages caused by chemicals to the respective producers of pollutants.

5106 **Umwelt- und Ressourcenschutz in der Entwicklungshilfe: Beihilfe zum Ueberleben. (Pollution protection and resource conservation in the economic aid of developing countries: a contribution to survival).** Hartje, V.J. Frankfurt am Main, Germany, F.R.; Campus (1982). 142p.

The contribution of the bilateral economic aid of the F.R. of Germany for diminishing the pollution and resource problems of the Third World is investigated. Not only the imported air and water pollution are considered the reasons for these problems but the specific aspects of environmental deterioration in developing countries as deforestation, desertification and ground erosion caused primarily by the poverty of the Third World are also included.

5107 **Hazardous materials transportation. Joint Hearing before the Subcommittee on Surface Transportation and the Subcommittee on Aviation of the Committee on Public Works and Transportation, House of Representatives, Ninety-Seventh Congress, First Session, March 15, 1981.** Washington, DC; Government Printing Office (1982). 58p.

Four witnesses representing electric utilities, federal and state transportation agencies, and the State of New York argued the pros and cons of transporting hazardous wastes prior to reauthorization of the Hazardous Materials Transportation Act, which was passed in 1974 to reduce risks to public health and safety. Areas of concern include the training given to handlers of nuclear and other hazardous materials, community understanding and protection, and procedures for responding to emergencies. (DCK)

5108 **Environmental management under uncertainty.** Dasgupta, P. (London School of Economics, England). pp 109-139 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 4 discusses some of the problems that arise in prescribing efficient policies for the public management of environmental resources under uncertainty. It focuses on decision rules under environmental uncertainty and on the harder problem of formulating planning rules when a government is not only faced with environmental uncertainty, but when there is also an information gap between the different agents in the economy. One class of incentive scheme designed to circumvent the classical free-rider problem serves as an illustration. The final section and appendix contain a comprehensive account of an incentive scheme for environmental control when only the firms know the pollution-abatement costs. The problem is presented in the context of the debate on the merits of effluent charges versus standards. 26 references, 4 figures.

5109 **Health implications of residuals discharges: a methodological overview.** Freeman, A.M. III. (Bowdoin Coll., Brunswick, ME). pp 140-164 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 5 addresses the market failure to compensate for health effects associated with the use of the environment as a receptacle for residuals from resource extraction, processing, and utilization. It examines the need to develop research strategies to identify and quantify the relationships between residuals discharges and their effect on human health, not only to gain a better understanding of the nature and magnitude of these effects, but to determine how they have changed over time as the economy has adjusted to changing resource availability and use. Other major areas for research are morbidity and nonfatal health effects and the estimation of the economic value of changes in health states. 37 references.

5110 **State of the environment, 1982.** Washington, DC; Conservation Foundation, Inc. (1982). 455p. Conservation Foundation, Inc., 1717 Massachusetts Ave., NW, Washington, DC 20036 $16.50.

The Conservation Foundation undertook this first comprehensive analysis of the environment at a time when the federal government is reducing the level of regulation, administration, and funding. The Foundation's report describes major environmental problems, indicates whether they are improving or getting worse, and outlines how institutional changes affect environmental policy. While the US has made impressive progress on some conventional problems, a new generation of environmental problems is emerging. The book also notes a deterioration in the information base, which serves as a basis for environmental policy. The chapters are grouped under nine major topics: underlying trends, air quality, water resources, hazardous wastes, energy, agriculture and forestry, land, the urban environment, and the Reagan administration and institutional change. 785 references, 99 figures. (DCK)

5111 **Annual committee reports on significant legislative, judicial, and administrative developments in 1981: Air Quality Committee.** *Natural Resources Lawyer;* **15**: No. 1, 1-64(1982).

The Steel Industry Compliance Extension Act of 1981 giving iron and steel facilities three more years to meet emission standards was the only substantive change in the Clean Air Act during 1981. Legal action developing during the year dealt with the designation of air-quality-control regions, the establishment of and determination of compliance with national ambient air-quality standards, the adequacy of state implementation plans and state plan revisions, new source performance standards, new source permitting, enforcement, standards, Title II cases, and performance warranties. There was a decline in Environmental Protection Agency regulatory actions in accordance with the administration's promise to relieve affected industries. (DCK)

5112 **Impact of EPA programs on Connecticut air quality. Hearing before a Subcommittee of the Committee on Government Operations, House of Representatives, Ninety-Seventh Congress, Second Session, March 25, 1982.** Washington, DC; Government Printing Office (1982). 107p. GPO.

A field hearing in Norwalk, Connecticut, part of the Clean Air Act review, considered changes proposed by the Reagan Administration and included in House bill 5252, the Luken proposal, which could cause air-quality deterioration and threaten public health. The 12 witnesses challenging the bill represented the Connecticut Department of Environmental Protection, health professions and agencies, economists, and environmental groups. Additional letters and statements from labor and other interest groups follow the statements of the witnesses. (DCK)

5113 **Alternatives for coping with acid deposition problems.** Wetstone, G.; Reed, P.; Futrell, J.W. *Environmental Policy and Law;* 7: No. 4, 155-158(18 Nov 1981).

A summary of the Environmental Law Institute's Report to the National Commission on Air Quality. The difficulty of selecting an appropriate governmental response to the acid deposition problem is exacerbated by the existence of two important and countervailing factors. Urgency: The potential for irreversible environmental damage in acid sensitive areas calls for prompt action. Uncertainty: Our ability to respond effectively and efficiently is hampered by our incomplete understanding of the phenomena and its effects.

5114 **Senior level meeting on Environmental Law.** *Environmental Policy and Law;* 7: No. 4, 150(18 Nov 1981).

The problems dealt with by the ad hoc Meeting of Senior Government Officials Expert in Environmental Law, held in Montevideo in November, are discussed, as an introduction to the full report of the meeting to be printed in the first issue of 1982.

5115 **New direction.** *Environmental Policy and Law;* 7: No. 4, 174-179(18 Nov 1981).

The article gives a description on a sector-by-sector basis for the US environment machinery, in Summer 1981 under the Reagan Administration: Cuts in Environment Monitoring and Policy Oversight; Cuts in Environmental Protection; Cuts in Natural Resource Conservation; Cuts in Federal Energy Conservation. But US environmentalists are closing their ranks in opposition to these developments and public opinion polls indicate continued strong support for environmental protection measures. The fight for the US environment is still on.

5116 **Environmental protection organisation.** Cockerell, M.J. *Environmental Policy and Law;* 7: No. 4, 180-181(18 Nov 1981).

The Environmental Protection Organisation (EPO) was established in 1979 with terms of reference as laid out in the booklet Environmental Protection Law of the People's Republic of China. It fits into the government organisation.

5117 **Prevention of significant deterioration of air quality.** Washington, DC; National Academy Press (1981). 166p. National Academy Press, 2101 Constitution Ave., NW, Washington, DC 20418.

The Clean Air Act Amendments of 1977 (PL 95-95, -91 Stat. 731) established a national program to prevent significant deterioration of air quality (PSD) where the air is relatively clean. The amendments also mandated two independent studies of the PSD provisions of the Act, one to be performed by the National Commission on Air Quality and one by the National Academy of Sciences. This report contains the findings, conclusions, and recommendations of the Academy's study. The objective of the study was to examine the implementation of the PSD provisions, with special emphasis on the extent to which they make sense in light of current scientific and technical knowledge. This report therefore examines what is known about the air-quality related values that the PSD provisions were established to protect (Chapter 2); describes the applicability and limitations of air-quality models for use in preconstruction review (Chapter 3); discusses the potential effects of the PSD provisions on siting of major emitting facilities and on industrial development (Chapter 4); addresses the availability of control technology for PSD purposes (Chapter 5); and reviews alternatives within and to the current program for achieving PSD objectives (Chapter 6). Chapter 1 describes the elements of the PSD program contained in the Act and elaborated in the federal regulations.

5118 **Assessment of actual and perceived risks of energy development.** Cohen, J.J.; Smith, C.E. (LLNL, Livermore, CA 94550). *Transactions of the American Nuclear Society;* **35:** 18-19(1980). (CONF-801107—).

From ANS international conference; Washington, DC, USA (17 Nov 1980).

5119 **Legislator's guide to hazardous-waste management.** Steeler, J.H. Denver, CO; National Conference of State Legislatures (1980). 56p. National Conference of State Legislatures, 1125 Seventeenth Street, Suite 1500, Denver, CO 80202.

The Environmental Protection Agency (EPA) estimates that only 10% of America's hazardous wastes are properly managed, a situation that can lead to serious environmental and health problems. The Resource Conservation and Recovery Act requires a national management program with state governments administering federally-approved programs. The minimum state program covers the identification of hazardous wastes; sets standards for generating, transporting, and storing wastes; and sets up a permit-and-enforcement program. State response has not been uniform, however. This legislative guide examines and compares the federal and state programs. Sample legislation illustrates how states have acted innovatively in certain areas in response to state issues. California's approach has emphasized the degree of hazard, while Pennsylvania has focused on absolute liability and Minnesota on comprehensive planning. 16 references, 1 table. (DCK)

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REFER ALSO TO CITATION(S) 5055, 5074, 5075, 5076, 5100, 5108, 5109, 5260, 5261, 5271, 5278, 5279, 5280, 5281, 5282, 5283, 5284, 5285, 5286, 5404, 5432

5120 **(DOE/R4/20006—T28) Brief reconnaissance study for the addition of hydropower for Eury Dam, Troy, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 14 Jul 1982. Contract AC44-80R420006. 20p. NTIS, PC A02/MF A01. Order Number DE82019456.

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The feasibility of developing hydroelectric power at the Eury Dam in Troy, North Carolina was studied. This dam, built in 1916 for impounding a small storage reservoir, has a developable head of 35 ft. Information is presented on: the site characteristics; the potential developer, customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible. (LCL)

5121 **(DOE/R4/20006—T29) Brief reconnaissance study for the addition of hydropower for Capelsie Dam, Capelsie, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 14 Jul 1982. Contract AC44-80R420006. 20p. NTIS, PC A02/MF A01. Order Number DE82019455.

Portions of document are illegible.

The feasibility of developing hydroelectric power at the Capelsie Dam in Capelsie, North Carolina was studied. This dam, built in 1898 for diverting river flow into a canal, has a developable head of 28 ft. Information is presented on: the site characteristics; the potential developer, customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible if the cost of money is less than 15%. (LCL)

5122 **(DOE/R4/20006—T30) Brief reconnaissance study for the addition of hydropower for Sandy Creek Dam, Ramseur, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 14 Jul 1982. Contract AC44-80R420006. 18p. NTIS, PC A02/MF A01. Order Number DE82019454.

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The feasibility of developing hydroelectric power at the Sandy Creek Dam in Ramseur, North Carolina was studied. This dam, built in 1978 for impounding municipal water supplies, has a developable head of 35 ft. Information is presented on: the site characteristics; the potential developer, customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible. (LCL)

5123 **(DOE/R4/20006—T31) Brief reconnaissance study for the addition of hydropower for Turnersburg Dam, Turnersburg, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 14 Jul 1982. Contract AC44-80R420006. 18p. NTIS, PC A02/MF A01. Order Number DE82019778.

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The feasibility of developing hydroelectric power at the Turnersburg Dam in Turnersburg, North Carolina was studied. This dam, built in 1900 to provide hydromechanical power to a downstream mill, has a developable head of 24 ft. Information is presented on: the site characteristics; the potential developer; customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible if money is available at less than 15% interest. (LCL)

5124 **(DOE/R4/20006—T32) Brief reconnaissance study for the addition of hydropower for Liledoun Dam, Liledoun, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 14 Jul 1982. Contract AC44-80R420006. 18p. NTIS, PC A02/MF A01. Order Number DE82019779.

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The feasibility of developing hydroelectric power at the Liledoun Dam in Liledoun, North Carolina was studied. This dam, built in 1920 for water impoundment, has a developable head of 22 ft. Information is presented on: the site characteristics; the potential developer, customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible if the cost of money is less than 16%. (LCL)

5125 **(DOE/R4/20006—T33) Brief reconnaissance study for the addition of hydropower for Millersville Dam, Millersville, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 14 Jul 1982. Contract AC44-80R420006. 18p. NTIS, PC A02/MF A01. Order Number DE82019780.

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The feasibility of developing hydroelectric power at the Millersville Dam in Millersville, North Carolina was studied. This dam, built in 1930 for hydropower generation, has a developable head of 32 ft. Information is presented on: the site characteristics; the potential developer, customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible if existing equipment is repaired. (LCL)

5126 **(DOE/R4/20006—T34) Brief reconnaissance study for the addition of hydropower for Lincoln Plant Dam, Lincolnton, North Carolina.** Gebhard, T.G. Jr. (Gebhard (Thomas G.), Austin, TX (USA)). 23 Jun 1982. Contract AC44-80R420006. 19p. NTIS, PC A02/MF A01. Order Number DE82019776.

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The feasibility of developing hydroelectric power at the Lincoln Plant Dam in Lincolnton, North Carolina was studied. This dam, built in 1929 for hydropower generation, has a developable head of 13 ft. Information is presented on: the site characteristics; the potential developer, customer power demand; environmental, institutional and safety aspects of the proposed development; power plant potential and characteristics; and the calculation of the costs and benefits of the proposal. Based on the assumptions used, hydropower development at this site was found to be economically feasible if the full potential of the dam is developed. (LCL)

5127 **(GAO/EMD—82-29) Mineral data in the Forest Service's Roadless Area Review and Evaluation (RARE II) is misleading and should be corrected.** (General Accounting Office, Washington, DC (USA). Office of the Comptroller General). 4 Feb 1982. 25p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906035.

Portions of document are illegible.

GAO found that the mineral data in the RARE II report contains several inaccuracies that may be misleading: (1) areas were rated as having little or no mineral potential when they should have been rated as having unknown potential; (2) indications of mineral potential were inconsistently applied from one area to another; and (3) mineral data for certain confined geographic areas was projected into larger areas. GAO wants the Congress to be aware of the inaccuracies and limitations of the RARE II report when considering wilderness legislation and recommends that the Department of Agriculture provide the Congress with corrected data.

5128 **Law of The Sea: a crossroads for American foreign policy.** Ratiner, L.S. (Dickstein, Shapiro and Morin, Washington, DC). *Foreign Affairs;* **60**: No. 5, 1006-1021(Sum 1982).

Mr. Ratiner feels that the Reagan administration's refusal to sign the final treaty of the Law of the Sea Conference may deprive the US of an opportunity to participate in a global regulatory organization that may reject rights claimed by American mining companies as well as fishing and shipping rights and jurisdiction over the continental shelf. He thinks the long-term foreign policy setback for the US will be significant. This article describes the inter-agency review of the draft treaty, which was biased and under pressure to reach a consensus. Disagreement arose between those who saw the treaty as a flawed barrier to the US effort to regain a position of power and influence and those who recognized that there was room for renegotiation during the ratification process to protect US interests. The efforts among participants to reach a compromise were rejected by the administration. Failure to sign will exclude the US from mini-treaties between individual countries with overlapping claims if our allies sign the treaty. (DCK)

5129 **Depletion and natural resources.** Martin, S. *Quarterly Review of Economics and Business;* **22**: No. 2, 41-53(Sum 1982).

An indirect test of the role of scarcity in natural extraction and based on the impact of scarcity on factor employment is applied to two extractive industries. There is evidence that scarcity affects employment in the Canadian gold industry, whether scarcity is measured by physical or market measures. Physical measures are not important for the US copper industry, although the price index of scarcity is modestly significant when expectations are not explicitly modeled. 16 references, 4 tables.

5130 **Behavior of optimal exploration and extraction rates for nonrenewable resource stocks.** Liu, P.T.; Sutinen, J.G. (Univ. of Rhode Island, Kingston). *Resources and Energy;* **4**: No. 2, 145-162(Jun 1982).

Models are developed to examine the behavior of optimal exploration and production policies over time. The principal model is singular in the exploration control and possesses four phases of the exploitation cycle. Explicit sets of conditions are established that (1) give rise to a U-shaped price path, and (2) determine when additions to reserves from exploration are greater than or less than extraction, and when exploration ceases. Three alternative specifications of the principal model are considered, and with a separable benefit function it is shown that a higher discount rate lends to a lower level of cumulative exploration. 15 references, 4 figures.

5131 **Optimal pricing and resource development policies for energy-importing economies.** Clarke, H.R. (Asian Inst. of Technology, Bangkok, Thailand). *Resources and Energy;* **4**: No. 2, 173-193(Jun 1982).

This paper derives optimal pricing and resource investment-decision rules for the supply of energy in a small open economy that imports some of its energy at fixed real prices. The key result obtained is that, from the viewpoint of maximizing consumption flows, both domestically produced and imported energy should be priced in parity with international energy prices. In addition, a domestic resource-devoted capital stock should be accumulated to derive maximum benefit from domestic energy resources. This stock varies positively with international energy prices and negatively with social discount rates and the conversion efficiency of international to domestic energy. Adjustment paths toward this desired stock are analyzed. 17 references, 3 figures.

5132 **Natural resources: stewardship of our public lands.** Jackson, H. (US Senate, Washington, DC). *Environment;* **24**: No. 5, 2-5(Jun 1982).

Senator Jackson notes that the Reagan administration's strategy of using budget cuts as a policy tool is evident in the area of natural resources, notably by the following: not including urban parks in the national park system; the low priority given to land acquisition; and the emphasis on resource development over conservation. Further, the administration has not requested funding for recreational grant programs, which are administered by the states and already incorporate the concepts of the new federalism. He feels that efforts to turn public lands over to the private sector bear watching because they seek a short-term gain at the expense of future public-land uses. He observes that Interior Secretary Watt's proposal to expedite land and offshore leasing has created a problem where none existed before. At issue in the Reagan initiatives is the proper stewardship of public lands, which should be a bipartisan effort. (DCK)

5133 **Monopoly power and the recycling of raw materials.** Martin, R.E. (Louisiana State Univ., Baton Rouge). *Journal of Industrial Economics;* **30**: No. 4, 405-419(Jun 1982).

A leader-follower model of monopolist recycling in the case of the Aluminum Company of America (ALCOA) shows that industry output in the presence of raw-material recycling will be at least as great and sometimes significantly greater than when there is no recycling. Monopoly rents will drop as the technology for scrap recovery or conversion improves, and rise if the scrap leaks into export markets. The consumer benefits if the scrap-recovery sector is separate from the monopolist, but will not be worse off if pro-

duction is integrated. The monopolist has no incentive for partial integration even if there are no entry barriers. 7 references. (DCK)

5134 **Risk reduction of international mining projects by means of investor consortia and diversification of external financing.** Kirchner, C. *Erzmetall;* **35**: No. 4, 209-213(Apr 1982). (In German).

Investors and creditors of international mining projects bear specific risks which may be reduced by means of forming investor and financing consortia. Risk is defined for each actor separately. Project risk and investor risk respectively credit risk are useful categories in order to analyze risk reduction. In each case formation of consortia has a positive influence on the economic viability of the project, and thus reduces the project risk. Furthermore, formation of consortia leads to better compliance of the host country of the mining project with the project and financing agreements. Thus, investor and credit risk may be reduced.

5135 **Optimal pricing, use, and exploration of uncertain natural resource stocks.** Arrow, K.J.; Chang, S. (Stanford Univ., CA). *Journal of Environmental Economics and Management;* **9**: No. 1, 1-10(Mar 1982).

Units of natural resources, to be called "mines," are assumed distributed over an unexplored territory according to a Poisson process in space. At any moment, total reserves and unexplored land are given. Society can determine the rate of consumption and the rate of exploration. Reserves are drawn down by consumption and increased by discoveries made during exploration; the amount of unexplored land is decreased by exploration. At any moment, the payoff of society is a concave function of consumption less a linear function of exploration with future payoffs discounted. Optimal policies are considered and, in particular, it is shown for a large amount of unexplored land the shadow prices of reserves and of unexplored land move in random cycles but show only a slight upward tread, thereby casting some light on the failure of mineral prices to rise at the market rate of interest.

5136 **Hazards of the international energy crisis.** Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982). 220p. (CONF-7808138—). St. Martin's Press, Inc., 175 Fifth Avenue, New York, NY 10010. Order Number DE82903690.

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

Individual chapters are included in the data base. (PSB)

5137 **Importance of strategic raw materials.** Gutteridge, W.F. (Univ. of Aston, Birmingham, England). pp 192-202 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

The author discusses the implications for countries with unique mineral supplies in both social and political situations. International rivalry is viewed as a real source of danger that must be converted to public realization. (PSB)

5138 **Explorations in natural-resource economics.** Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982). 363p. Resources for the Future, Inc., 1755 Massachusetts Ave., NW, Washington, DC 20036.

This volume reports the results of a multidisciplinary effort to explore the limits of conventional economic models that describe the role of natural and environmental resources in economic activities. Prompted by the conflicts between the fairly optimistic views held by many economists concerning the prospects for compatibility between resource availability, population, and economic growth - and the more-pessimistic perceptions of these same issues held by a substantial number of earth and life scientists - the editors attempted to consider the fundamental underpinnings of each position and the possibilities for research to begin resolving some of the differences. After the introductory and background chapter by the editors, each of the following parts contains two chapters: (II) Modeling the Role of Natural Resources in Economic Growth; (III) Evaluating the Social Costs of Degrading Environmental Resources; (IV) Measuring the Role of Natural Resources in Production Processes; and (V) Geological and Economic Modeling of Resource Availability. A separate abstract was prepared for each of the nine chapters.

5139 **Toward reformulating the role of natural resources in economic models.** Smith, V.K. (Univ. of North Carolina, Chapel Hill); Krutilla, J.V. pp 3-43 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

This is an overview of the research papers making up this volume and considers how the definition and treatment of natural resources affects the modeling of economic activities, paying special attention to production processes and to measuring the characteristics of these activities. Conventional economic analyses of natural resources largely treat them as synonymous with raw-materials inputs to production and focus on the intertemporal implications of exhaustibility. When the concept of natural resources is broadened to include all the original endowments of the earth, the analysis must expand to include the processes which allocate resources that cannot be exchanged on organized markets; for example, air and water. More specifically, one must inquire if it is possible to use existing institutions or to structure new ones that will reveal the information necessary for efficient allocation of nonmarketable natural resources. The relationship between geological sciences and economics is discussed in defining how to measure the long-term availability of minerals or model the processes through which these minerals are discovered and used. 119 references, 1 table.

5140 **Measurement of raw-material inputs.** Lau, L.J. (Stanford Univ., CA). pp 167-200 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 6 examines the problems in defining aggregate materials at the plant, industry, and economy levels to establish whether increasing, constant, or decreasing quantities are needed to produce a given set of outputs. This information combined with alternative-technology scenarios may be used to evaluate the sufficiency of the existing stock of raw materials. The analysis demonstrates that it is possible to construct an aggregate quantity of raw-material inputs for specific end-use sectors, but more research is needed before an aggregate quantity can apply to the economy as a whole. 12 references.

5141 **Assessment of long-term supplies of minerals.** Harris, D.P. (Univ. of Arizona, Tucson); Skinner, B.J. pp 247-326 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

Chapter 8 describes some of the issues involved in the geologic assessment of mineral endowment and the economic assessment of mineral resources in an effort to separate some of the complex issues of discovery, development, and production. Four common metals (iron, aluminium, titanium, and magnesium) and silicon show an inverse relation between grade level and distribution, while the limits of a second group of metals will not cause an abrupt challenge to technology. There are limits to the geochemically scarce metals of copper, lead, zinc, molybdenum, and gold that will force abrupt technological changes when they are depleted. The US has already passed through the prospecting and detection phases with these metals, and is now at the stage of using geological models to improve productivity. A better geological model is needed, however, for making inventories of mineral endowment. 50 references, 20 figures, 12 tables. (DCK)

5142 **Measures of natural-resource scarcity under uncertainty.** Devarajan, S. (Harvard Univ., Cambridge, MA); Fisher, A.C. pp 327-346 of Explorations in natural-resource economics. Smith, V.K.; Krutilla, J.V. (eds.). Baltimore, MD; John Hopkins University Press (1982).

A simple two-period model explores the effects of uncertainty on the discovery costs of natural resources and on the exploration and extraction behavior of mining firms. Uncertainty is found to affect the behavior of a risk-adverse firm that maximizes the ex-

pected utility of profits, but the direction of the effect is ambiguous because expected marginal discovery is not equated to rent. These results do not speak to the question of whether the firm will explore more or less under uncertainty than under certainty, even when the difference between marginal costs and benefits can be assigned because rent is not the same in the two cases. The response of the optimal value of the objective function to a change in the stock will be different because the optimal values differ. 26 references.

5143 **Energy and water development appropriations for 1983. Part 8. Testimony of members of Congress and other interested individuals and organizations (pages 1347-2777). Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, Ninety-Seventh Congress, Second Session, Subcommittee on Energy and Water Development.** Washington, DC; Government Printing Office (1982). 1428p. GPO.

Part 8 of the hearing record covers the testimony of members of Congress and other individuals and groups interested in energy and water projects. The record begins with the testimony of six Congressmen from Kentucky on appropriations for projects in that state. Other speakers address projects in Nebraska, the Upper Mississippi River, western states, the Tug Valley region of southwest Virginia and eastern Kentucky, and others. Witnesses disagreed on the need for and the environmental and economic consequences of various projects. Energy projects under considerations include the gas-cooled reactor and magnetic fusion programs in addition to solar, cogeneration, and other development programs. (DCK)

5144 **Profitability of commercial fertilisers and pesticides for farmers in a period of rising operating costs and sinking producer prices.** Steffen, G. *Bericht ueber Landwirtschaft;* **59**: No. 4, 584-606(1981). (In German).

The demand for means of production in the private farming sector must be viewed against the background of changes in the overall framework of the conditions under which the farmers are operating. Changes in price relationships, taken together with environmental legislation, can affect the demand for fertilisers and pesticides. In this article three possible effects on demand are considered in relation to three different types of farm - fruit, meat, egg and poultry, and forage-growing. First, a uniform picture of the development of expenditure on commercial fertilisers and pesticides is given for all three types of farm using card indexes for individual fruits, and for the farms as a whole using profit and loss accounting data. The question as to how sinking prices for produce and rising prices for production materials within various framework of farming policy can affect income is also dealt with on a uniform basis. These overall background conditions are important for understanding the changing demand for fertilisers and pesticides when prices are rising for individual products. The author uses winter wheat, sugar beet and grassland to illustrate this.

5145 **1981 spring annual conference and World Productivity Congress: proceedings.** Norcross, GA; American Institute of Industrial Engineers, Inc. (1981). 811p. (CONF-810538—). American Institute of Industrial Engineers, Inc., 25 Technology Park/Atlanta, Norcross, GA 30092. Order Number DE82904704.

From Spring AIIE conference; Detroit, MI, USA (17 May 1981).

Separate abstracts were prepared for seven papers presented at the proceedings and will appear in Energy Research Abstracts; six papers will appear in Energy Abstracts for Policy Analysis. One paper had previously appeared in the DOE data base. One hundred and five papers were considered out of scope of DOE data base. (MCW)

5146 **Regional issues in energy development: a dialogue of east and west.** Leman, C.K. (ed.). Cambridge, MA; University Consortium for Research on North America (1981). 87p. (CONF-8104174—(Summ.)). University Consortium for Research on North America, 1737 Cambridge St., Cambridge, MA 02138. Order Number DE82906101.

From Joint Canadian/US symposium on regional issues energy development: a dialogue of east and west; Boston, M. USA (10 Apr 1981).

Topics presented at the symposium include: comparing C nadian and US regional energy conflicts, beyond greed and env summary of energy impacts on resource-rich and resource-poor r gions; equity and efficiency in regional energy policy; technical s lutions to political problems; political solutions to political pro lems; and a summary, pulling apart or getting together, an asses ment of the dialogue. (GHT)

5147 **Food, energy and society.** Pimental, D.; Pimenta M. London, England; Edward Arnold (1979). 165 Edward Arnold, London, England/3.95 pounds.

Twelve chapters are presented in this book - the first four which concern hunter-gatherer society, the development of agricu tural systems, and an introduction to the relative energy costs manpower, animal power and machines in food production. Th main section of the book (Chapters 6-9) documents the energy u in the production of livestock, grain and legumes, fruit, vegetab and forage, and fish. Comparisons of energy inputs and outputs a made for different crops and for countries at different levels of d velopment. The final section of the book covers food processin packaging and transport costs. The message of the book is that switch from the high overall protein and high animal protein diet the industrialized countries is overdue. Such a move, the autho maintains, will reduce the total fossil fuel requirements for foo production and enable more people to be adequately fed. Th author also recommends extensive use of bicycles for transport tion.

2905 Research, Development, Demonstration, And Commercialization

REFER ALSO TO CITATION(S) 5043, 5047, 5143, 5225, 5313, 5438

5148 **Economic analyses at early stages of technolog development.** Cummings, R.G. (Univ. of New Mexico, Albu querque); Schulze, W.D. *Resources and Energy;* 4: No. 105-119(Jun 1982). Contract AS04-79ET27017.

This paper is concerned with the use of economic analysis t aid in allocating research and development funds both between a ternative energy sources and within a particular technology. Exam ples are given of the role of early economic-feasibility analysis fo new solar and geothermal technologies. 2 references, 6 figures.

5149 **Technology transfer and development: a prelim nary look at Chinese technology in Guyana.** Long, F. (Carib bean Science and Tech. Project, Oxford, England). *Inte ciencia;* 7: No. 3, 136-140(May 1982).

Technology is regarded as a vital ingredient for develo ment. Since developing countries can hardly fill their technologic requirements indigenously, such countries tend to acquire the bul of technology applied to their production systems from abroa However, the transfer of technology tends to be associated with series of problems: foreign exchange, inappropriateness, the gener tion of limited inter-sectorial linkages, limited use of raw material and other inputs associated with technology dependency. The stud points to the fact that technology transfer need not necessarily b associated with the disadvantages identified in the literature. Th study which essentially looks at the use of Chinese technology clay-brick manufacturing in Guyana, shows that the country w able to reap several development benefits from the technolog transfer arrangement. At the same time, certain problems arisir from the technology-transfer package such as the transfer of critic skills in key areas of production, and maintenance and servicin are discussed. But these, the author argues, are not a function restrictive conditions found in technology-transfer clauses, b rather of improper technology-transfer management. 2 tables.

5150 **Future energy options for developing countrie** Zaric, Z.P. (International Centre for Heat Transfer, Be grad, Yugoslavia). *Interciencia;* 7: No. 3, 148-152(May 198

An educated guess is made of the energy demand in developing countries well into the next century in order to estimate the possible role of new and renewable sources in meeting this demand. The world is roughly divided into industrialized (IND) and developing (LDC) countries. A plot of energy demand in both parts shows a possible structure of mixed energy to meet LDC demand, but there is a gap between demand and supply from conventional sources in LDCs that has to be met by new and renewable sources. When the demand for specific energy forms is projected, as much as two thirds of the final energy needed from new sources should be based on centralized-electricity and liquid-fuels technologies. Solar and geothermal energy must compete with nuclear and thermonuclear breeders, while solar prospects for chemical fuel supply in LDCs lacking adequate coal reserves seems promising. There is a large gap in research and development (R and D) spending on new energy between the two parts, which means that LDCs will have inappropriate technology at a high price. An increase in R and D spending on a regional basis should target funds to appropriate options. 6 references, 7 figures.

5151 **Draft of the programme 'Energy research and energy technologies 1981'. Pt. 2.** *Technologie-Nachrichten Programm-Informationen;* No. 275, 1-20(15 Feb 1982). (In German).

Part 2 of this comprehensive programme includes: coal and other fossil-energy carriers, new power plant and fuel technologies, coal purification, exploration of deposits, mining technology, preparation, underground gasification, new methods for the production, preparation and storage of petroleum and natural gas, renewable energy sources, solar energy utilization as a heat source, electric power from solar energy, energy from biomass and waste, wind power, geothermal energy, and controlled nuclear fusion.

5152 **Draft of the programme 'Energy research and energy technologies 1981'. Pt. 1.** *Technologie-Nachrichten Programm-Informationen;* No. 274, 1-20(1 Feb 1982). (In German).

Part deals with: targets and basic conditions, targets and tasks, reasons for governmental promotion, tasks of energy research, financing and performing the programme, r + d of new technologies for the rational utilization and provision of energy, application techniques for the final consumer, and techniques and methods for the provision of secondary energy.

5153 **Third Update of the energy programme.** Engelmann, U. *Zeitschrift fuer Energiewirtschaft;* No. 4, 269-272(Dec 1981). (In German).

With the Third Update, published on 4th November 1981, the Federal Government has presented the political programme meant to further support the adaptational process of German economics to a world-widely changed energy situation during the Eighties. The last programmatical summary of the Government's energy policy had been produced in 1977. The Third Update is therefore an exhaustive stock-taking of the present development and the wither to existing energy policy and contains conclusions for future policy drawn from this analysis.

2906 Nuclear Energy

REFER ALSO TO CITATION(S) 5107, 5295, 5339, 5394

5154 **(BNL-NUREG—31733) Quantification of human performance through the use of nuclear-power-plant experience.** Hall, R.E. (Brookhaven National Lab., Upton, NY (USA)). Jun 1982. Contract AC02-76CH00016. 8p. (CONF-820656—4). NTIS, PC A02/MF A01. Order Number DE82020028.

From Workshop on low-probability/high consequence risk analysis; Arlington, VA, USA (15 Jun 1982).

There is wide agreement throughout the commercial nuclear industry that there is a severe shortage of data on man-machine success or failure rates. At the same time, the need to adequately integrate human performance and system's analysis in the evaluation of nuclear power plant availability and safety is recognized as a dominant need. Therefore, if we are to successfully address the industry's current requirements, we must optimize the use of all existing data. This paper discusses the problem and suggests useful ways of utilizing available nuclear data and presents a conceptual format to better collect actuarial data on the most critical, from a safety perspective, aspects of the man-machine interface in a nuclear power plant.

5155 **(DOE/NBM—2021741) Toward a national policy for managing low-level radioactive waste: key issues and recommendations.** Duerksen, C.J.; Mantell, M.; Thompson, G.P. (Conservation Foundation, Washington, DC (USA)). Jun 1981. Contract AC07-76ID01570. 180p. NTIS, PC A09/MF A01. Order Number DE82021741.

The Conservation Foundation, a not-for-profit research and public education organization, asked individuals with diverse backgrounds and viewpoints to come together under Foundation leadership as a Dialogue Group on Low-Level Radioactive Waste Management. The group, including persons who represent waste generators, concerned citizens, state regulators, and environmentalists, met over an 18-month period to discuss issues crucial to the development of a national policy on low-level wastes. The Dialogue Group agreed that three principles, if accepted broadly, would form the basis of a sound national policy for managing low-level radioactive wastes: with proper implementation, technology exists to manage low-level waste safely; generators and their customers should pay disposal costs; and greater public involvement at all stages can improve the disposal system. These principles acted as polestars for the group as it worked toward a series of policy recommendations in four main areas: (1) cleaning up closed commercial sites; (2) remodeling a system for defining and classifying low-level radioactive waste; (3) siting new low-level waste disposal facilities; and (4) decommissioning, long-term care, and liability. This report presents an extensive discussion of these recommendations covering qualifications, limitations, and alternatives.

5156 **(DOE/NE—0039) Program summary. Nuclear waste management and fuel cycle programs.** (USDOE Assistant Secretary for Nuclear Energy, Washington, DC). Jul 1982. 79p. NTIS, PC A05/MF A01. Order Number DE82021692.

This Program Summary Document describes the US Department of Energy (DOE) Nuclear Waste Management and Fuel Cycle Programs. Particular emphasis is given to near-term, specifically Fiscal Year (FY) 1982, activities. The overall objective of these programs will be achieved by the demonstration of: (1) safe radioactive waste management practices for storage and disposal of high-level waste and (2) advanced technologies necessary to close the nuclear fuel cycle on a schedule which would assure a healthy future for the development of nuclear power in this country.

5157 **(EPRI-NP—2529) Value-impact methodology for decision makers.** Stamatelatos, M.G.; Leary, R.H.; Ligon, D.M.; Sibold, B.B. (General Atomic Co., San Diego, CA (USA)). Aug 1982. 130p. NTIS, PC A07/MF A01. Order Number DE82905851.

Portions of document are illegible.

This report documents a case study illustrating the use of a value-impact methodology in a nuclear safety system design analysis. The theoretical framework of multi-attribute decision theory is combined with reliability, availability, and probabilistic risk assessment techniques to analyze design alternatives for the auxiliary feedwater system of a specific nuclear plant. Decision attributes in the areas of financial impact, investment risk, health risk, and licensability are used to prioritize the alternatives. A brief critique of the methodology as applied to the case study is offered.

5158 **(GJO—100-82) Statistical data of the uranium industry.** (Department of Energy, Grand Junction, CO (USA). Grand Junction Office). 1 Jan 1982. 85p. NTIS, PC A05/MF A01. Order Number DE82021651.

Statistical Data of the Uranium Industry is a compendium of information relating to US uranium reserves and potential resources and to exploration, mining, milling, and other activities of the uranium industry through 1981. The statistics are based primarily on data provided voluntarily by the uranium exploration, mining, and

milling companies. The compendium has been published annually since 1968 and reflects the basic programs of the Grand Junction Area Office (GJAO) of the US Department of Energy. The production, reserves, and drilling information is reported in a manner which avoids disclosure of proprietary information.

5159 **(NP—2904673) Time to take control: the states and low-level radioactive waste.** Melson, G. (National Conference of State Legislatures, Denver, CO (USA)). Jun 1981. 6p. NTIS, PC A02/MF A01. Order Number DE82904673.

Discussed is the progress states have made in the challenge of regional cooperation in the management of low-level radioactive wastes. The immediate need for new disposal sites and a long-term need for additional sites to handle the steadily increasing amounts of low-level wastes are described. Success depends on states taking ownership of the problem. The states are acting under a federal law enacted last year which encourages the formation of interstate compacts for dealing with low-level wastes. By 1986, a disposal site can refuse to accept wastes from a state that is not part of an interstate compact. Problems confronted in the siting of disposal facilities are discussed. A state may opt for establishing its own facility or stop generating low-level wastes. (DMC)

5160 **(NUREG/CR—2833-Vol.1) Critical human-factors issues in nuclear-power regulation and a recommended comprehensive human-factors long-range plan. Executive summary.** Hopkins, C.O.; Snyder, H.L.; Price, H.E.; Hornick, R.J.; Mackie, R.R.; Smillie, R.J.; Sugarman, R.C. (Human Factors Society, Inc., Santa Monica, CA (USA)). Aug 1982. 62p. GPO $5.00. Order Number DE82906249.

This comprehensive long-range human factors plan for nuclear reactor regulation was developed by a Study Group of the Human Factors Society, Inc. This Study Group was selected by the Executive Council of the Society to provide a balanced, experienced human factors perspective to the applications of human factors scientific and engineering knowledge to nuclear power generation. The report is presented in three volumes. Volume 1 contains an Executive Summary of the 18-month effort and its conclusions. Volume 2 summarizes all known nuclear-related human factors activities, evaluates these activities wherever adequate information is available, and describes the recommended long-range (10-year) plan for human factors in regulation. Volume 3 elaborates upon each of the human factors issues and areas of recommended human factors involvement contained in the plan, and discusses the logic that led to the recommendations.

5161 **(NUREG/CR—2833-Vol.2) Critical human-factors issues in nuclear-power regulation and a recommended comprehensive human-factors long-range plan. Programs evaluation and recommended long-range plan.** Hopkins, C.O.; Snyder, H.L.; Price, H.E.; Hornick, R.J.; Mackie, R.R.; Smillie, R.J.; Sugarman, R.C. (Human Factors Society, Inc., Santa Monica, CA (USA)). Aug 1982. 382p. GPO $9.50. Order Number DE82906211.

This comprehensive long-range human factors plan for nuclear reactor regulation was developed by a Study Group of the Human Factors Society, Inc. This Study Group was selected by the Executive Council of the Society to provide a balanced, experienced human factors perspective to the applications of human factors scientific and engineering knowledge to nuclear power generation. The report is presented in three volumes. Volume 1 contains an Executive Summary of the 18-month effort and its conclusions. Volume 2 summarizes all known nuclear-related human factors activities, evaluates these activities wherever adequate information is available, and describes the recommended long-range (10-year) plan for human factors in regulation. Volume 3 elaborates upon each of the human factors issues and areas of recommended human factors involvement contained in the plan, and discusses the logic that led to the recommendations.

5162 **(NUREG/CR—2833-Vol.3) Critical human-factors issues in nuclear-power regulation and a recommended comprehensive human-factors long-range plan. Critical discussion of human factors areas of concern.** Hopkins, C.O.; Snyder, H.L.; Price, H.E.; Hornick, R.J.; Mackie, R.R.; Smillie, R.J.; Sugarman, R.C. (Human Factors Society, Inc., Santa Monica, CA (USA)). Aug 1982. 277p. GPO $8.00. Order Number DE82905818.

This comprehensive long-range human factors plan for nuclear reactor regulation was developed by a Study Group of the Human Factors Society, Inc. This Study Group was selected by the Executive Council of the Society to provide a balanced, experienced human factors perspective to the applications of human factors scientific and engineering knowledge to nuclear power generation. The report is presented in three volumes. Volume 1 contains an Executive Summary of the 18-month effort and its conclusions. Volume 2 summarizes all known nuclear-related human factors activities, evaluates these activities wherever adequate information is available, and describes the recommended long-range (10-year) plan for human factors in regulation. Volume 3 elaborates upon each of the human factors issues and areas of recommended human factors involvement contained in the plan, and discusses the logic that led to the recommendations.

5163 **(ORNL—5880) Incentives and the siting of radioactive waste facilities.** Carnes, S.A.; Copenhaver, E.D.; Reed, J.H.; Soderstrom, E.J.; Sorensen, J.H.; Peelle, E.; Bjornstad, D.J. (Oak Ridge National Lab., TN (USA)). Aug 1982. Contract W-7405-ENG-26. 90p. NTIS, PC A05/MF A01. Order Number DE82020706.

The importance of social and institutional issues in the siting of nuclear waste facilities has been recognized in recent years. Limited evidence from a survey of rural Wisconsin residents in 1980 indicates that incentives may help achieve the twin goals of increasing local support and decreasing local opposition to hosting nuclear waste facilities. Incentives are classified according to functional categories (i.e., mitigation, compensation, and reward) and the conditions which may be prerequisites to the use of incentives are outlined (i.e., guarantee of public health and safety, some measure of local control, and a legitimation of negotiations during siting). Criteria for evaluating the utility of incentives in nuclear waste repository siting are developed. Incentive packages may be more useful than single incentives, and nonmonetary incentives, such as independent monitoring and access to credible information, may be as important in eliciting support as monetary incentives. Without careful attention to prerequisites in the siting process it is not likely that incentives will facilitate the siting process.

5164 **(PNL—4405) Summary of non-US national and international fuel cycle and radioactive waste management programs 1982.** Harmon, K.M.; Kelman, J.A. (Pacific Northwest Lab., Richland, WA (USA)). Aug 1982. Contract AC06-76RL01830. 106p. NTIS, PC A06/MF A01. Order Number DE82022520.

Brief program overviews of fuel cycle, spent fuel, and waste management activities in the following countries are provided: Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Finland, France, German Federal Republic, India, Italy, Japan, Republic of Korea, Mexico, Netherlands, Pakistan, South Africa, Spain, Sweden, Switzerland, Taiwan, USSR, and the United Kingdom. International nonproliferation activities, multilateral agreements and projects, and the international agencies specifically involved in the nuclear fuel cycle are also described.

5165 **How to think about nuclear war.** Luttwak, E.N. (Georgetown Univ., Washington, DC). *Commentary;* 74: No. 2, 21-28(Aug 1982).

Mr. Luttwak, a professional defense consultant, observes that the arguments of nuclear freeze proponents can be refuted on both strategic and moral grounds. The freeze concept is illogical, he notes, because it is political systems - not state boundaries - that separate sides and because the Warsaw Pact countries are more heavily armed than the North Atlantic Treaty Organization (NATO) countries. An important factor keeping NATO forces at a disadvantage is their defensive orientation, which keeps forces mili-

tarily diffuse and dependent on nuclear weapons and preemptive action as a deterrent. Mr. Luttwak feels the shock effect of any use of nuclear weapons would probably shorten a war rather than expand it because of the instinct for survival on both sides; further, only nuclear weapons have this awesome power to deter. The proposal for universal disarmament under world government control is not a serious one, he thinks, and reflects an indifference to the possibility of a long non-nuclear war. The effect would be to trade the risk of nuclear death for the inevitability of many non-nuclear casualties. (DCK)

5166 **Putting World War III on ice: the nuclear freeze movement takes off.** Pringle, P. *Inquiry Magazine;* **5**: No. 11, 13-18(Jul 1982).

Mr. Pringle observes that grassroots support for the anti-nuclear movement is behind both early- and late-comers among scientists and statesmen. He notes that the freeze movement has grown even faster than its organizers expected, forcing the administration's attention as US-Soviet strategic-arms talks get underway. The opposition of religious groups swelled beyond the traditional peace groups as people questioned the moral acceptability of counterforce policies. The development of this movement was further strengthened by the arguments of physicians that medical science cannot deal with the aftermath of a nuclear exchange. Senators Kennedy and Hatfield called for a bilateral freeze that is gaining support in Congress and putting additional pressure on the administration. (DCK)

5167 **Nuclear weapons and the preservation of peace. A response to an American proposal for renouncing the first use of nuclear weapons.** Kaiser, K. (Research Inst. of the German Society for Foreign Affairs, Bonn, Germany); Leber, G.; Mertes, A.; Schulze, F.J. *Foreign Affairs;* **60**: No. 5, 1157-1170(Sum 1982).

Discussions with the Western Alliance have raised confusion over the terms first use and first strike involving nuclear weapons. The proposal by Bundy, Kennan, McNamarra, and Smith in early 1982 confused the issue by using both terms. The relevant issues are those of defensive first use and the flexible response and improved crisis management necessary to prevent war. To renounce first use would undermine this strategy and make war more probable. While agreeing that a limited nuclear war would be difficult to control, the authors of this article suggest that the necessary mutual, verifiable arms reductions would be difficult to achieve. Anticipating a less-than-worst-case scenario in which Alliance members accept equal risks and equal security, they recommend strengthening conventional options to raise the threshold for nuclear weapons. (DCK)

5168 **Mexico: swapping crude for atoms.** Navarro, B. *Energy Detente;* **3**: No. 8, 1-9(24 Jun 1982). (In English and Spanish).

Mexico, considered the Saudi Arabia of the Western Hemisphere because of its proven and potential petroleum reserves, has surprised the world: it has embarked on the biggest nuclear-electric program in the Third World, only to postpone it days before scheduled approval of an international bidding (on which the atomic energy industry had pinned its hopes). A graph shows Mexican supplies of electricity by source with official projections to 1990. The point of entrance of the first nuclear reactor, originally scheduled for 1982, won't come onstream until 1983; and how nuclear-generated electricity grows close to 5% of the total in 1990. The big question is, will the future President of Mexico give the green light to the atomic megaproject? And if he does, how will Mexico deal with the serious logistics problems and grave ecological implications confronting the industry worldwide? In this issue, the author and Energy Detente touch on these questions and review the nuclear power status of Mexico, as well as addressing some of its global problems. Also presented in this issue is an update of the fuel price/tax series for the Western Hemisphere countries.

5169 **Wanting on waste.** *Environmental Action;* **14**: No. 1, 4(Jun 1982).

The Senate bill S 1662, the Nuclear Waste Policy Act of 1982, was approved by the Senate in April. In addition to authorizing creation of a federal away from reactor (AFR) storage facility, the bill also speeds up licensing of expanded storage facilities. The author opposes the bill and recommends readers to write their congressmen and urge the passage of a bill presently in the House of Representatives. (JMT)

5170 **Japan's search for identity in the nuclear age.** Kenzaburo, O. *Alternatives;* **7**: No. 4, 547-559(Spr 1982).

Japan's position has been one of an outsider in the nuclear age at the same time it has been a victim to the first use of atomic weapons. Quoting from Japanese poets and writers, the author constructs a model of the time to create an image of modern Japan's cultural identity as a result of the Meiji Restoration and the close of World War II. The end of the Emperor System and alienation from the rest of Asia are significant consequences of these events. The author feels that current arguments that Japan should arm itself with nuclear weapons ignore the miseries Japan alone has felt and should be restricted. Although a new Japanism which is oriented away from western culture is emerging today, efforts to rediscover the folk culture can also recapture the nonnuclear vision of 1945. (DCK)

5171 **Going broke on atoms.** Loeb, P. *Inquiry Magazine;* **5**: No. 6, 12-15(29 Mar 1982).

The financial mess surrounding four unfinished nuclear plants planned by the Washington State Public Power Supply System (WPPSS) with public support has turned the projects into a controversial issue that threatens the future of US nuclear power. The economic effects of construction delays are multiplied by the need to respond to new safety standards and challenges, but many also blame the young labor force, the billing system which committed ratepayers to cover costs, and poor management for the problems. (DCK)

5172 **Radiation hazards in fission fuel cycles.** Rotblat, J. pp 107-126 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

A summary of radiation hazards from all parts of the nuclear fuel cycle is given in terms of the UNSCEAR estimates of the collective dose commitment. The author notes that at present time this radiation hazard is negligible (less than background fluctuations); however, he warns that by the year 2000, the dose will become significant. (PSB)

5173 **Evolutionary strategy for nuclear power.** Feiveson, H.A.; von Hippel, F.; Williams, R.H. (Princeton Univ., NJ). pp 127-168 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

This chapter explores the role of such alternative systems in the development of nuclear power in the US and elsewhere. Rationale is given for making proliferation resistance a design criterion for nuclear energy system and the value of isotopic-denaturing of reactor fuel in achieving such proliferation resistance. Uranium efficiency and economics of power generation for the alternative reactor systems are considered. Evolutionary strategy is detailed for nuclear power development for the US and the world. (PSB)

5174 **European community energy policy and non-proliferation.** Jacchia, E. pp 169-178 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

The author discusses the lack of get-tough attitudes in political solutions of the proliferation threat but sees the recent scientific breakthrough in nuclear fusion as hope for a new political direction. (PSB)

5175 **Threat of nuclear violence at the non-governmental level.** Feld, B.T. (Massachusetts Inst. of Tech., Cambridge). pp 179-191 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

Safeguarding nuclear weapons from falling into the hands of non-governmental terrorist groups is discussed. Political and technical solutions are seen as necessary before international action can be achieved. (PSB)

5176 **Nuclear energy and public safety (Part I): a bibliography of popular literature.** Gabriel, M.R. Chicago, IL; CPL Bibliographies (1982). 78p. CPL Bibliographies, 1313 East 60th St., Chicago, IL 60637 $12.00.

The focus of Part 1 is to aid the general research (especially undergraduate students and the general public) to locate information on the safety aspects of nuclear energy. A subject index after the bibliography breaks down the entries into 11 subtopics. An author index is also provided. This part of the bibliography consists of books, periodical articles, and government publications dating from 1959 to 1980.

5177 **Nuclear energy and public safety (Part II): a bibliography of technical resources.** Gabriel, M.R. Chicago, IL; CPL Bibliographies (1982). 53p. CPL Bibliographies, 1313 East 60th St., Chicago, IL 60637 $8.00.

Part 2 of the bibliography focuses on technical information of interest to those concerned with the operation of nuclear power plants and the subjects of safety and accidents. A subject index included after the bibliography provides a breakdown of the references into seven categories. There is also an author index. The material cited is available through the National Technical Information Service (NTIS) in Springfield, Virginia.

5178 **Cleanup efforts at Three Mile Island. Hearing before the Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce, House of Representatives, Ninety-Seventh Congress, First Session, March 30, 1981.** Washington, DC; Government Printing Office (1982). 75p. GPO.

Bruce Babbitt, Governor of Arizona and chairman of the Nuclear Safety Oversight Committee, Rep. Allen Ertel of Pennsylvania, and Susan Shanaman, chairman of the Pennsylvania Public Utilities Commission, testified on the cleanup effort at Three Mile Island and the allocation of liability for the accident. Babbitt's comments emphasized his committee's concern over the lack of a clear policy on safety issues. Among other things, this hearing discussed funding for the cleanup and for handling high-level radioactive wastes and the lack of progress in either area. (DCK)

5180 **Green light for Japanese reprocessing.** Patermann, C. *VDI-(Verein Deutscher Ingenieure) Nachrichten;* **35**: No. 43, 4(23 Oct 1981). (In German).

In the last few years, international discussions of peaceful nuclear energy use and non-proliferation have been greatly influenced by the attitude of the US Government. Since the mid-Seventies, in the Carter area, this attitude has changed due to the fear that world-wide use of so-called sensitive technologies, i.e. uranium enrichment, reprocessing, and fast breeder development may increase the hazard of misuse for the production of nuclear weapons.

5181 **Why is nuclear energy indispensable.** Keiser, G. *Energiewirtschaftliche Tagesfragen;* **32**: No. 1, 26-30(Jan 1981). (In German).

The third update of the Federal Government's energy programme refers to the subject nuclear energy only with the idea that for energy and industrial political reasons nuclear energy should make a further increasing contribution to power generation in the field of base load. It is true, the annex contains - in form of an abstract - the results of a study of the three energy-economic Institutes which also contain some precise data on the necessary expansion of the Atomic Energy Act. The wording of the update report, however, clearly says that the Federal Government does not adopt the forecastings of the Institutes especially those for the capacity of nuclear power plants considered to be necessary by 1995 (37 000 to 39 500 MW). So, for a number of comprehensible reasons, the Federal Government consciously rejects a nuclear power plant programme such as Government and Parliament have recently decided on in France. Just for this reason, it seems to be reasonable to consider carefully which data and facts have to be taken into account with such a programme and to which results such a - let's say experimental - evaluation could lead. This is the purpose of this contribution.

5182 **Final epidemic: physicians and scientists on nuclear war.** Adams, R.; Cullen, S. (eds.). Chicago, IL; Educational Foundation for Nuclear Science, Inc. (1981). 265p. University of Chicago Press, Marketing Dept., 5801 S. Ellis Ave., Chicago, IL 60637, $4.95.

Symposia held by Physicians for Social Responsibility and the Council for a Livable World are part of an aggressive assault on the threat of thermonuclear war as a preventable disease. This collection, mostly by doctors, examines the issues of nuclear war in terms of the medical mission that doctors accept of preserving public health. The authors find that prevention is the only viable answer, while civil defense is only an illusion. The papers are grouped under the headings: Symptoms, Causes, Pathogenesis, Prognosis, and Treatment. 121 references, 10 figures, 22 tables. (DCK)

5183 **Uranium: supply and demand to 1990.** *Quarterly Energy Review - North America;* 1-12(1981).

A 45% fall in the real price of uranium on the US spot market is due largely to utilities drawing down inventory levels in response to economic conditions and a decline in power demand. Market analysts see no chance for a major price recovery before the end of the decade. Low prices will force high-cost mines out of business. Nuclear power, which figured significantly in plans for new generating capacity, is particularly vulnerable to the global recession and drop in consumption. Short-run projections show adequate uranium supplies shifting to a supply shortage by 1990 unless new capacity is developed in time to keep up production. The US, Canada, and South Africa provided 70% of uranium for the West in 1980, but only Australia and Canada will increase their production. Although producers and consumers are dependent upon each other, the lack of government regulation and middlemen has permitted large market fluctuations. 2 tables. (DCK)

5184 **European churches and the energy issue.** Solms, F. Heidelberg, Germany, F.R.; Forschungsstaette der evangelischen Studiengemeinschaft (1980). 193p.

Within the last years the energy problem in general and the nuclear energy issue in particular has become of some concerns to European churches. This was the common feeling of the participants and delegates from various European churches coming together for a two days consultation in Brussels on the 24th and 25th of October, 1978. Besides of some bilateral talks this consultation has been the first attempt for a detailed discussion on the energy issue between churches in Europe on an expert level. The participants presented official statements of their churches and some of them summarized the actual official energy policy of the governments of their countries which are printed here under personal responsibility of the authors. The official statements and the national surveys reflect the political and economic situation until 1979.

5185 **Legal consequences of nuclear accidents and shutdowns. Regulatory matters. Private litigation matters. Transcript of proceedings, held in Hershey, Pennsylvania, July 27-28, 1979.** Philadelphia, PA; Pennsylvania Law Journal (1980). 575p. (CONF-790796—). Pennsylvania Law Journal, 66 N. Juniper St., Philadelphia, PA 19107. Order Number DE82906012.

From Conference on legal consequences of nuclear accidents and shutdowns; Hershey, PA, USA (27 Jul 1979).

Four months after the Three Mile Island-2 accident, the Pennsylvania Law Journal assembled many of the most prominent attorneys with experience in nuclear power issues to discuss and explore some of the questions confronting lawyers and their clients affected by the nation's worst civilian nuclear accident. It is signifi-

cant that the conference was held in Hershey, Pennsylvania, seven miles from Harrisburg, the State Capitol, and 15 miles from Three Mile Island. The conference focused on the legal issues, of rates, used and useful, and cost of replacement energy; and the litigation issues - extraordinary nuclear occurrence, theories of liability, and damages. The audience also had a need to discuss the future of Federal regulation as well as the issues of most immediate concern.

2907 Transport And Storage

5186 **Viability of thermal storage.** Svennberg, S.A. *National Swedish Board for Technical Development Informs about Energy Technology;* No. 1, 3-5(1982).

Just as energy storage increases the efficiency of power-generation and -distribution systems, thermal storage in buildings can maintain a more-constant temperature while using less energy and allowing the use of renewable energy sources. Heavy building structures, increased convection area through hollow slabs, and separate storage facilities using water, stone, or water as ice, water of crystallization, or in reservoirs are common ways to store energy in buildings. 4 figures. (DCK)

5187 **Electric car batteries.** Bursell, M. (Royal Inst. of Technology, Stockholm, Sweden). *National Swedish Board for Technical Development Informs about Energy Technology;* No. 1, 3-4(1981).

Electric cars have the same 6 to 10% overall efficiency of cars fueled with coal-based liquids, but they eliminate noise pollution and shift air pollution to power plants that can be located at a distance from urban areas. Although electric cars can be powered by a range of assured fuels, further research is needed to improve their range. A comparison of metal-air, closed iron-oxygen, and iron-oxygen batteries shows that the iron-oxide battery has the longest (350-km) range with a three-year service life, but is only 40% efficient. Metal-air batteries have only a 70-km range and a one-year service life, but achieve 80% efficiency. Closed iron-oxide batteries have a 140-km range, a three-year life, and 70% efficiency. 1 table. (DCK)

2908 Waste Heat Utilization

REFER ALSO TO CITATION(S) 5237

5188 **(P—500-82-005) Cogeneration in municipalities. Workshop proceedings for local governments and municipal utilities.** Patterson, S. (ed.). (California Energy Resources Conservation and Development Commission, Sacramento (USA)). Jan 1982. 71p. NTIS, PC A04/MF A01. Order Number DE82905758.

Five papers from workshops for local governments and municipal utilities are included. A separate abstract was prepared for each.

5189 (P—500-82-005, pp 6-17) **Municipal cogeneration.** Gandara, A.; Park, S.L. Jan 1982. NTIS, PC A04/MF A01. Order Number DE82905758.

In Cogeneration in municipalities. Workshop proceedings for local governments and municipal utilities.

The energy situation, cogeneration systems, cogeneration potential, advantages of cogeneration, the California Energy Commission projects, issues in development, and the reasons cities should be interested are reviewed.

5190 (P—500-82-005, pp 18-31) **California air quality regulations for cogeneration projects.** Amar, P. Jan 1982. NTIS, PC A04/MF A01. Order Number DE82905758.

In Cogeneration in municipalities. Workshop proceedings for local governments and municipal utilities.

The following regulatory concerns are discussed: regulatory jurisdiction, permit procedures, new pollution source review, best available control technology, permit application-authority to construct, and permit to operate.

5191 (P—500-82-005, pp 32-38) **Steps to successful permitting of cogeneration projects.** Bass, R.; Fickett, K. Jan 1982. NTIS, PC A04/MF A01. Order Number DE82905758.

In Cogeneration in municipalities. Workshop proceedings for local governments and municipal utilities.

The benefits of cogeneration are listed. The role of the Office of Permit Assistance and the Cogeneration Desk is described. The agencies involved in the regulation of cogeneration are listed. Air quality is discussed as the greatest environmental concern.

5192 (P—500-82-005, pp 39-58) **Financing cogeneration systems.** Moran, E.; Weinress, J. Jan 1982. NTIS, PC A04/MF A01. Order Number DE82905758.

In Cogeneration in municipalities. Workshop proceedings for local governments and municipal utilities.

The assessment of financial risks associated with a particular project and finding ways of mitigating those risks and developing a credit support framework are dicsussed. Sources of financing are described.

5193 (P—500-82-005, pp 59-67) **Tax-exempt funding for cogeneration facilities by municipal governments.** Swan, S.L. Jan 1982. NTIS, PC A04/MF A01. Order Number DE82905758.

In Cogeneration in municipalities. Workshop proceedings for local governments and municipal utilities.

Three major forms of exempt financing a municipality could use are discussed: revenue bonds, non-profit corporation lease leaseback bonds, and joint exercise of powers lease rental bonds. Advantages and legal issues involved in each type are explored.

5194 **Financing cogeneration projects.** Huyck, P.M. (First Boston Corp., MA). *Energy Economics, Policy and Management;* 2: No. 1, 4-13(Sum 1982).

Cogeneration equipment is relevant to the transition from cheap abundant fuel to new energy infrastructures. Both direct ownership and project financing are available for cogeneration. Direct ownership can be handled through tax-benefit transfers, tax-exempt financing, arbitrage electricity sales under the Public Utility Regulatory Policies Act, and non-recourse financing. Third-party financing is a financing and ownership alternative that requires careful analysis for each project because of variations in capital and legal constraints, taxes, accounting treatment, facilities, and fuel sources. (DCK)

5195 **Five aspects of cogeneration-system financing.** Danziger, R. *Energy Economics, Policy and Management;* 2: No. 1, 14-23(Sum 1982).

Five aspects of cogeneration financing arrangements covered in this report are: cash flow, the financing risks of completion and operation, security expectations, investment vehicles, and creative financing. Creative financing for cogeneration projects as well as renewable energy sources offers the investors and companies involved opportunities to structure the legal, financial, and regulatory parameters and maximize tax benefits. Cogeneration combined with renewable energy systems and conservation technologies can have a variety of ownership arrangements, each with its own risks and benefits that must be allocated. (DCK)

5196 **Regulations/tax incentives: impact on cogeneration projects.** Barrett, W. *Energy Economics, Policy and Management;* 2: No. 1, 24-33(Sum 1982).

A number of legal and financial incentives relate to cogeneration. The Public Utility Regulatory Policies Act (PURPA) rules dealing with power sales by cogenerators to utilities have been controversial in the areas of avoided costs and exemptions and in their objective of benefiting cogenerators instead of sharing savings. The Natural Gas Policy Act is more lenient in this respect. Both the Energy Tax Act and the Windfall Profits Tax support cogeneration development with tax credits. Three new bills introduce additional incentives of ownership and tax credits. Utility enthusiasm for cogeneration will ultimately depend on its cost effectiveness to central power generation. (DCK)

5197 **Industrial cogeneration with coal gasification.** Coffeen, W.G. III. *Energy Economics, Policy and Management;* 2: No. 1, 34-50(Sum 1982).

High industrial fuel costs are again focusing attention upon cogeneration and synthetic fuels, both technologies dating from the 1800s. The two can combine to generate lower cost and more efficient fuel systems. Among the cogeneration technologies that can be incorporated into gas-producer systems are the organic Rankine engine, waste-heat boiler, gas turbine, combined-cycle gas turbine, steam-boiler cogeneration, fuel cell, and two-stage fixed-bed gasifier. The Wellman two-stage gasifier can produce hot raw, hot detarred, and cold clean gas according to the application. Examples of gas-producer systems cover estimated cost and operating plans. 4 references, 6 figures. (DCK)

5198 **Stand-alone cogeneration by large building complexes.** Stone, R. *Energy Economics, Policy and Management;* 2: No. 1, 51-69(Sum 1982).

This article focuses on the benefit of on-site cogeneration in the production of electric power and thermal energy as applied to urban residential and commercial applications. Specific attention is paid to installations in the metropolitan New York City area. 3 tables.

5199 **PURPA: a summary.** Fowler, P.A.; Karvelis, L.J. Jr.; Sitzer, H. (Merrill Lynch Pierce Fenner and Smith, Inc., New York, NY). *Energy Economics, Policy and Management;* 2: No. 1, 70-72(Sum 1982).

This brief overview of PURPA (the Public Utilities Regulatory Policies Act) has been abstracted from a report by the authors entitled The Outlook for Alternative Generation Financial Techniques in Public Power. Much of today's interest in cogeneration facilities stems from the passage of this act. The courts have addressed several challenges to PURPA rules.

5200 **Danish way of heat.** Johnson, C.; Coyne, P. *Energy Manager;* 5: No. 6, 27-28(Jun 1982).

As many as 50% of Danish homes will benefit from combined heat and power (CHP) and district heating by 1995. In operation since 1927, Denmark's district-heating networks have expanded to 400 communities to supply 30% of all space heat. The 12 operating CHP plants use a variety of fuels, technologies, and heat sources, such as waste heat from industries, and sewage treatment plants. (DCK)

5201 **Supply concept for Wolfsburg and district.** Strickrodt, J. *Fernwaerme International;* 11: No. 3, 116-119, 119-120(May 1982). (In German and English).

As the Volkswagen plant and the city were founded in the thirties a combined heat and power station for industrial and public requirements was established. The district heating system set up at that time was extended after the war as a terrain covering system. 95 000 inhabitants, which over 70% of the population, are currently supplied. The local supply concept, presented in 1979 as a part of the detailed plan, forsees further extension of the district heating system to include two neighbouring communities. The energy basis remains the coal-fired heat and power station of the Volkswagen Works.

5202 **Why is pipeline installation in Flensburg less expensive.** Kloepsch, M. *Fernwaerme International;* 11: No. 3, 122-127(May 1982). (In German).

The Flensburg city works have developed a programme for pipeline installation which achieves especially low construction costs. This programme consists of a collection of measures which include both simplified technological execution and improved organisation and administration. The most significant savings are made in excavation work by reducing the building volume and using the duct widths to better advantage.

5203 **Heating union between government and industry - exemplified by the county hospital Wunstorf.** Fiege, W.; Schoen, R. *Fernwaerme International;* 11: No. 3, 174-177(May 1982). (In German).

With technical and financial support from the Government of Lower Saxony it was possible to finalise a heating union between the County Hospital Wunstorf and the Langnese-Iglo conc Here waste heat from Langnese's deep-freeze production is ployed for space heating and warm water supply using heat pu and block heat and power station technologies.

5204 **Waste heat utilization in Denmark.** Mortens H.C. *Fernwaerme International;* 11: No. 3, 178-180(M 1982). (In German).

Contracts between industrial companies and district h suppliers have been signed everywhere in Denmark with the aim utilize industrial waste heat to the benefit of both parties. Sc plants are described.

5205 **Computer-aided design of a greenhouse waste-he utilization system.** Manning, T.O.; Mears, D.R. (Rutg Univ., New Brunswick, NJ). *Energy in Agriculture;* 1: No 5-20(Nov 1981).

The objective was to design a prototype greenhouse heat system utilizing warm water from a specific electric-power-gene ing station. To take into account the effects of changes in fact affecting greenhouse energy requirements, computer simulation v extensively used to evaluate a number of possible designs. Site-s cific information was available on the weather and the temperat of the power plant's condenser discharge water at hourly interv over the entire year. The computer simulation program was usec compare different design options and to explore the interactions tween heating systems, power plant water and outside ambient t peratures, and temperature control strategies. Using the results the computer studies a 1.1-ha prototype was designed and c structed. It operated successfully throughout the 1980-1981 heat season. In the fall a poinsettia crop was produced, and in the spr there were lilies, pot mums, other potted plants, and a beddi plant crop of tomatoes. 5 references, 6 figures, 4 tables.

5206 **Fernwaermeversorgung aus Heizwerken. Planu Bau und Betrieb. (District heat supply from thermal po plants).** Frankfurt am Main, Germany, F.R.; Verlags- u Wirtschaftsgesellschaft der Elektrizitaetswerke m.b (VWEW) (1981). 205p.

This study discusses district heat supply as a long-te supply task in town-planning and housing construction. Pollut abatement benefits are noted. Factors determining the applicabi of district heat for a certain town are: residental building co construction costs, provision of district heat; and the availability main-bound supply systems. Laws, regulations, standards and gui lines are important when planning and constructing thermal po plants. The construction and the technical design as well as costs of a district heat plant are dependent on the heat demand, tems selection, fuel type, heat distribution networks and the co tions for connections to District Heat Supply (DHS). The ove goal of safety and dependability of supply with economic operat The sale of district heat requires consideration of the legal basis, termination of the performance required, measuring and settling heat consumption, and price formation with regulations concern price chages, as well as the settling of accounts with the reside Contracts as well as laws and regulations seek coordinations tween customers, managers, planners and engineers of DH pla

5207 **Cogeneration: a concept for today.** Ross, J (Univ. of Tennessee, Cookeville, TN). *American Institut Industrial Engineers, Detroit Chapter, Proceedings of Annual Conference;* 582-587(1981). (CONF-810538—). troit, MI, USA (17 May 1981).

The cogeneration concept applies to practices which ut waste heat, steam, waste materials or equipment for multiple en conversions including electric power generation. The broad fiel cogeneration and associated economic and qualitative benefits defined, and some specific applications are indicated. Steps for ciding if cogeneration would benefit your company are liste case history of a successful small scale cogeneration project is tailed to demonstrate the feasibility of cogeneration principles today's small or medium size industrial plant.

5208 **How to transform waste heat into money.** Johansson, T.; Jarlevang, L. (Chalmers Univ. of Technology, Goeteborg, Sweden). *National Swedish Board for Technical Development Informs about Energy Technology;* No. 1, 11-14(1981).

The National Swedish Board for Technical Development (STU) describes ways for industry to apply the exergy philosophy in recovering and using waste energy. The principle applies to hot air or flue gases and when there is a condensing steam at a higher temperature than ambient, which is better used for evaporation processes than for heating water. Residential district heating, transfer by heat pump to industrial applications, and the expansion of steam in a condensing turbine are the major uses of waste heat. The choice of uses varies in each case, but expansion is the most natural method. 3 figures, 1 table. (DCK)

2910 Conservation

REFER ALSO TO CITATION(S) 5102, 5429, 5437, 5450

5209 **(BNL—31765) Monitoring of residences with modified oil-heating systems.** Hoppe, R.J.; Graves, W.L. (Brookhaven National Lab., Upton, NY (USA)). 1982. Contract AC02-76CH00016. 31p. (CONF-820849—3). NTIS, PC A03/MF A01. Order Number DE82021753.

From Summer study in energy efficient buildings; Santa Cruz, CA, USA (22 Aug 1982).

An energy conservation study of residential fuel oil savings obtained by the refit of existing boilers and furnaces was made by a one-year field test of 250 detached houses in a 5500 annual heating degree day climate. Retention-head burners properly installed on boilers produced savings of 19%; the addition of vent dampers or boiler temperature programmers to these systems yielded little increase in savings. With boilers using conventional burners, a controls package consisting of a double setback clock thermostat plus a boiler temperature programmer produced fuel savings of 19% in homes unoccupied during the day. With conventional burners the use of vent dampers, flue heat exchangers, or double setback thermostats produced typical savings of 10%. Retention head-burners yielded 11% fuel savings with furnaces. The addition of vent dampers produced no further savings. For use in this project, a low cost method of calculating the annual fuel use in a building was developed that corrected for annual weather changes and for fuel use in heating domestic hot water. The data required were daily mean temperatures and fuel delivery dates and quantities; no instrumentation was installed in the buildings.

5210 (CONF-8110215—, pp 82-87) **Impact of regulation on conservation.** Millhone, J.P. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper discusses both administrative policy and public opinion of regulatory efforts to force energy conservation in residential and commercial services. Regulatory methods, though not favored by this administration, have not been repealed; they stand ready for implementation should the crises need arise. (PSB)

5211 (CONF-8110215—, pp 88-92) **Impact of regulation on energy consumption on transportation.** Rappaport, C.S. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper discusses the interrelationships between energy and the economy in the transportation sector. Discussion centers on policy changes relative to deregulation of energy prices and the energy conservation efforts. (PSB)

5212 **(DOE/CS/22804—1-Vol.3) Innovative financing for energy-efficiency improvements. Phase I report.** Klepper, M.; Schwartz, H.K.; Feder, J.M.; Smith, D.C.; Green, R.H.; Williams, J.; Sherman, J.L.; Carroll, M. (Lane and Edson, P.C., Washington, DC (USA)). Jan 1982. Contract AC02-81CS22804. 156p. NTIS, PC A08/MF A01. Order Number DE82009970.

Portions of document are illegible.

The use of utility-assisted financing, tax-exempt financing, bank financing, leasing, and joint venture financing to promote energy efficiency investments for each of three different categories of buildings (multifamily, commercial, and industrial) is discussed in separate chapters. (MCW)

5213 **(DOE/CS/62020—T4) Louisiana commercial energy-management workshops: grocery stores.** (Louisiana Dept. of Natural Resources, Baton Rouge (USA)). 1981. Contract FG46-80CS62020. 161p. NTIS, PC A08/MF A01. Order Number DE82019483.

Energy management for grocery stores is discussed, including five steps: performing an energy audit, undertaking a building walk-through survey, developing an understanding of utility rate structures, indentifying and implementing energy conservation opportunities, and maintaining ongoing management and monitoring of the program. Forms and instructions are provided for the building and equipment survey. Energy conservation opportunities include low-cost/no-cost options, retrofits, and some passive solar heating systems. Eight case histories are presented which illustrate the ideas presented. (LEW)

5214 **(DOE/CS/62020—T5) Louisiana commercial energy-management workshops: commercial buildings.** (Louisiana Dept. of Natural Resources, Baton Rouge (USA)). 1981. Contract FG46-80CS62020. 296p. NTIS, PC A13/MF A01. Order Number DE82019338.

Energy management for commercial buildings is discussed in terms of five steps: performing an energy audit, undertaking a building walk-through survey, developing an understanding of utility rate structures, identifying and implementing energy conservation opportunities, and maintaining ongoing management and monitoring of the program. Forms and instructions are provided for the building and equipment survey. Energy conservation opportunities include building operation and maintenance and retrofit projects. Aspects of the building systems are discussed, including the building envelope, lighting, heating, ventilation, air conditioning, refrigeration, domestic water, elevators, food preparation, and laundry. (LEW)

5215 **(DOE/CS/62020—T6) Louisiana commercial energy-management workshops: malls and shopping centers.** (Louisiana Dept. of Natural Resources, Baton Rouge (USA)). 1981. Contract FG46-80CS62020. 293p. NTIS, PC A13/MF A01. Order Number DE82019337.

An energy management program for shopping centers and malls is discussed which includes five steps: performing an energy audit, undertaking a building walk-through survey, developing an understanding of utility rate structures, identifying and implementing energy conservation opportunities, and maintaining ongoing management and monitoring of the program. Forms and instructions are provided for the building and equipment survey. Energy conservation opportunities discussed include building operation and maintenance and retrofit projects. A case history illustrates the points discussed. Building systems discussed one-by-one include the building envelope, lighting, heating, ventilation, air conditioning, domestic water, elevators, and escalators. (LEW)

5216 **(FHWA/TX—82/24-225-24) Evaluation of High-Occupancy-Vehicle projects in the HEEM.** Memmott, J.L.; Buffington, J.L. (Texas Transportation Inst., College Station (USA)). Jan 1982. 95p. (TTI—2-8-77-225-24). NTIS, PC A05/MF A01. Order Number DE82906165.

The increasing importance of improving the efficiency of transportation facilities has resulted in a need for a systematic economic model to evaluate High Occupancy Vehicle (HOV) projects. These projects encourage higher vehicle occupancy rates by re-

stricting the use of some portion of the facility to some vehicle types or minimum number of occupants. The feasibility is examined of using the Texas Highway Economic Evaluation Model (HEEM) to evaluate HOV projects. Three major deficiencies are examined: limited variety of highway types, assumptions in the model, and method of allocating corridor traffic to specific routes within the corridor. Additional highway types are recommended to evaluate HOV projects, along with parameter specifications for those highway types. Changes in the assumptions of the model include percent trucks, the occupancy rates, value of time, and future vehicle demand. The allocation of corridor traffic is an important aspect of evaluating HOV projects as well as other types of highway projects. An alternative allocation method is presented which is based upon minimized total user costs. This method results in corridor allocation such that the marginal user costs for each route in the corridor are equal. User cost functions are derived, based upon the user cost calculations in the HEEM, which can be used to allocate corridor traffic for any number of routes within the corridor. Recommended programming changes to the HEEM are presented to implement HOV analyses. This includes the marginal cost allocation method, and recommended values for the assumptions in the model as they relate to HOV projects.

5217 **(GAO/EMD—82-78) Appliance-efficiency standards: issues needing resolution by DOE.** Bowsher, C.A. (General Accounting Office, Washington, DC (USA). Office of the Comptroller General). 14 May 1982. 47p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906033.

The National Energy Conservation Policy Act directs the Secretary of Energy to prescribe efficiency standards, or make a no standard determination, for each of 13 major household appliances. DOE began analyses in 1978 and proposed standards for eight appliances. DOE then revised the standards but did not publish them. Additional work was done under the current administration resulting in an April 1982 proposal that no standards be established for appliances. It is concluded that the analytical basis for the April 1982 proposal is questionable and a no standards decision may adversely affect energy conservation and utility load management efforts in many states. Pointed out are the potential viability of proposing standards for certain appliances and indicated that the appliance labeling program for furnaces has limited potential. It is recommended that the Secretary of Energy make no decision on the need for appliance efficiency standards until he considers and resolves the issues raised.

5218 **(LBL—14651) Measured energy savings from two lighting control strategies.** Rubinstein, F.; Karayel, M. (Lawrence Berkeley Lab., CA (USA)). Jun 1982. Contract AC03-76SF00098. 9p. (CONF-821008—2). NTIS, PC A02/MF A01. Order Number DE82018778.

From IEEE annual meeting of the Industry Applications Society; San Francisco, CA, USA (4 Oct 1982).

The energy-saving benefits of two lighting control strategies - scheduling and daylighting - were investigated at demonstration sites in two large commercial buildings. A continuously-dimmable lighting control system was installed at the Pacific, Gas & Electric Co. building in San Francisco and an on/off switching system was installed at the World Trade Center building in New York City. By automatically scheduling the operation of the lighting systems to conform with occupancy patterns, lighting energy consumption was reduced 10 to 40%. Several scheduling techniques were investigated and the influence of switching zone size on energy savings was examined. Using photo-electrically controlled lighting systems which switch or dim lighting in accordance with available daylight, the energy consumed for lighting in daylit areas was reduced 25 to 35%. The influence of clear and overcast conditions on the energy savings associated with daylight-linked controls is discussed.

5219 **(LBL—14733) Infiltration and leakage measurements in new houses incorporating energy-efficient features.** Lipschutz, R.D.; Dickinson, J.B.; Diamond, R.C. (Lawrence Berkeley Lab., CA (USA)). Jul 1982. Contract AC03-76SF00098. 26p. (CONF-820849—5). NTIS, PC A03/MF A01. Order Number DE82020978.

From Summer study in energy efficient buildings; Santa Cruz, CA, USA (22 Aug 1982).

In order to increase energy efficiency in new residential housing, building contractors are using a number of recently developed infiltration-reducing construction techniques. One of these techniques is the installation of a continuous vapor barrier. A second technique is the selective sealing of infiltration sites with polymeric foam caulk following completion of the rough framing of a house. Measurements of leakage areas and infiltration rates in houses incorporating such energy-conserving measures can provide important information about their effectiveness. Houses with energy efficient designs in Eugene, Oregon and Rochester, New York were measured for effective leakage area using blower door fan pressurization. Air exchange rates were determined by tracer gas decay analysis. Fan pressurization measurements were made on 13 new houses in the San Francisco Bay area that had been partially sealed with polymeric foam sealant. A similar group of 13 new houses that had not been sealed were measured as controls. The results of these measurements were used in conjunction with an infiltration model developed at Lawrence Berkeley Laboratory to predict average annual and heating season infiltration rates. Specific leakage areas (leakage area per unit floor area) for the Eugene houses averaged 45% of that measured in post-1975 California housing. The energy-efficient Rochester houses were found to be 50% tighter (in terms of specific leakage area) than their non-energy efficient counterparts in the same area. Excluding leakage in the heating duct system, the average specific leakage area (leakage area per unit floor area) of the houses sealed with polymeric foam was 3.4 cm^2/m^2 (s.d. = 0.7) while the control group averaged 4.2 cm^2/m^2 (s.d. = 1.1), a 19% difference. This difference was found to be statistically significant at the 95% confidence level.

5220 **(LBL—14734) Result of recent weatherization retrofit projects.** Dickinson, J.B.; Lipschutz, R.D.; O'Regan, B.; Wagner, B.S. (Lawrence Berkeley Lab., CA (USA)). Jul 1982. Contract AC03-76SF00098. 21p. (CONF-820849—1). NTIS, PC A02/MF A01. Order Number DE82020313.

From Summer study in energy efficient buildings; Santa Cruz, CA, USA (22 Aug 1982).

Pacific Gas and Electric (PG and E) and the Bonneville Power Administration (BPA) have conducted studies in their respective service areas in order to evaluate the cost-effectiveness of certain conservation retrofits. Twenty houses in Walnut Creek, California, underwent an infiltration reduction program, similar to house doctoring. Ten of these houses also received additional contractor-installed measures. BPA retrofitted 18 houses at its Midway substation in central Washington. Retrofits made to the houses included: attic and crawlspace insulation, foundation sill caulking, storm windows and doors, increased attic ventilation, and infiltration reduction. Energy consumption and weather data were monitored before and after each set of retrofits in both projects. Leakage measurements were made by researchers from the Energy Efficient Buildings Program using blower door fan pressurization, thereby allowing calculation of heating season infiltration rates. An energy use model correlating energy consumption with outside temperature was developed in order to determine improvements to the thermal conductance of the building envelope as a result of the retrofits. Energy savings were calculated based on the results of the energy use model. As a check on these findings, the Computerized Instrumented Residential Audit (CIRA) load calculation program developed at Lawrence Berkeley Laboratory provided a theoretical estimate of the savings resulting from the retrofits. At Midway, storm windows and doors were found to save the most energy. Because the Midway houses were not very leaky at the beginning of the experiment, the infiltration reduction procedures were less effective than expected. In the Walnut Creek project, the infiltration reduction procedures did decrease the leakiness of the test houses, but the effect upon energy savings was not great.

5221 **(LBL—14788) Monitored low-energy houses in North America and Europe: a compilation and economic analysis.** Ribot, J.C.; Rosenfeld, A.H. (Lawrence Berkeley Lab., CA (USA)). Aug 1982. Contract AC03-76SF00098. 21p. (CONF-820849—8). NTIS, PC A02/MF A01. Order Number DE82021789.

From Summer study in energy efficient buildings; Santa Cruz, CA, USA (22 Aug 1982).

In a continuing compilation, BECA-A (Building Energy-Use Compilation and Analysis, Part A, New Homes), 128 submetered, energy-efficient homes in North America and Europe have been analyzed. Only 59 have acceptable data on additional first cost of conservation measures. Of these, the lowest cost of conserved energy is for the superinsulated category, where the cost of conserved energy is well under the average price of electricity, i.e. 6.2 cents/kWh. Only 37 homes have submetering adequate to permit correcting space heating loads for variations in occupant behavior (thermostat setting and internal gains). For these 37, the mean standardized thermal integrity is 50.3 kJ/m²-DD, compared to US 1979 building practice of 100, or US stock of 180.

5222 **(NP—2906088) Plug in to energy-conservation media materials.** (Florida Dept. of Agriculture and Consumer Services, Tallahassee (USA). Div. of Consumer Services). Jun 1982. 406p. State of Florida Public Commission, Fletcher Building, 101 East Gaines Street, Tallahassee 32301. Order Number DE82906088.

This compendium of available energy conservation information is based on survey responses from Florida electric and gas utility companies. For each entry is given the title, source, employee contact, audience, availability, whether or not a sample may be obtained, and whether or not the publication can be reprinted. For radio and television spots there is given the length of the spot and whether or not a script may be obtained. Areas covered include: air conditioning, alternate energy sources, appliances and appliances labeling, catalogs, caulking and weatherstripping, checklists and tips, construction, electricity, energy crisis and shortages, energy saving homes, exhibits and displays, fans and ventilation, fireplaces and wood burning stoves, general information, heating, heat pumps, insulation, lighting, load management, local utility information, mobile homes, natural gas, newsletters, pools, residential conservation service and energy audits, safety, solar, solar water heating, speakers bureau, tax credits and rebates, thermostats, utility bills and meters, waste heat recovery, water heating and conservation, and windows and doors. Participating utility companies and their mailing addresses, as well as other energy resources, are listed. (LEW)

5223 **(NYSERDA—82-21) Residential air leakage and indoor air quality in Rochester, New York.** Offermann, F.J.; Dickinson, J.B.; Fisk, W.J.; Grimsrud, D.T.; Desmond, R.M.; Lints, M.C. (Lawrence Berkeley Lab., CA (USA); Rochester Inst. of Technology, NY (USA)). Jul 1982. Contract W-7405-ENG-48. 107p. NTIS, PC A05/MF A01. Order Number DE82021590.

A sample of 58 occupied homes in Rochester, New York, most of which incorporated special builder-designed weatherization components, were studied to assess (1) the effectiveness of construction techniques designed to reduce air leakage; (2) the indoor air quality and air-exchange rates in selected tight houses; and (3) the impact on indoor air quality of mechanical ventilation systems employing air-to-air heat exchangers. The specific leakage area was measured in each house using the fan pressurization technique. Houses built with polyethylene vapor barriers and joint-sealing were as a group 505 tighter and had a 30% lower overall average heat loss coefficient ($W/°C\text{-}m^2$) than a similar group of houses without such components. Mechanical ventilation systems with air-to-air heat exchangers were installed in nine relatively tight houses, some of which had gas stoves and/or tobacco-smoking occupants. Air-exchange rates and indoor concentrations of radon (Rn), formaldehyde (HCHO), nitrogen dioxide (NO_2), and humidity, were measured in each house for one-week periods with and without mechanical ventilation. More detailed measurements including concentrations of carbon monoxide, and inhalable particulates were made in two of these houses by a mobile laboratory. In all nine houses, air-exchange rates were relatively low without mechanical ventilation, 0.2 to 0.5 ach, and yet indoor concentrations of Rn, HCHO, and NO_2 were below existing guidelines. Mechanical ventilation systems were effective in increasing air-exchange rates and in further reducing indoor contaminant concentrations. The average sensible effectiveness of the heat exchangers was 0.65 +- 0.16. It was concluded that when contaminant source strengths are low, acceptable indoor air quality can be compatible with low air-exchange rates.

5224 **(PNL—4329) Analysis of changes in residential energy consumption, 1973-1980.** King, M.J.; Belzer, D.B.; Callaway, J.M.; Adams, R.C. (Pacific Northwest Lab., Richland, WA (USA)). Sep 1982. Contract AC06-76RL01830. 31p. NTIS, PC A03/MF A01. Order Number DE83000383.

The progress of energy conservation in the residential sector since the 1973 to 1974 Arab oil embargo is assessed. To accomplish this goal, the reduction in residential energy use per household since 1973 is disaggregated into six possible factors. The factors considered were: (1) building shell efficiencies, (2) geographic distribution of households, (3) appliance efficiency, (4) size of dwelling units, (5) fuel switching, and (6) consumer attitudes. The most important factor identified was improved building shell efficiency, although the impact of appliance efficiency is growing rapidly. Due to data limitations, PNL was not able to quantify the effects of two factors (size of dwelling units and fuel switching) within the framework of this study. The total amount of the energy reduction explained ranged from 18 to 46% over the years 1974 to 1980.

5225 **(TVA—2903917) Energy management annual report, Fiscal Year 1981.** Steffy, R.C. Jr. (Tennessee Valley Authority, Chattanooga (USA)). 1 Mar 1982. 77p. NTIS, PC A05/MF A01. Order Number DE82903917.

Portions of document are illegible.

Data in this report reflects TVA's efforts toward energy conservation, detailed through its general utility operations and through its related energy conservation programs, projects, and demonstrations which began in 1973. An internal energy management plan was developed for implementation of Executive Order No. 11912 as modified by Executive Order No. 12003, the National Energy Act of 1978, and the Federal Energy Management and Planning (FEMP) Program (10 CFR Part 436). The document established energy performance goals and objectives for all TVA operations and buildings. Energy conservation efforts include general transportation, industrial operations, utilities operations, administrative operations, and research and development operations. Conservation efforts owned and leased buildings are detailed in Section IV. Related activities include various energy conservation programs, demonstration programs, and solar and other renewable resource programs. Energy use data for buildings and fuel used by activities is summarized in attachments 1 through 4. (PSB)

5226 **Pros and cons of apartment complex submetering.** Reichelt, G.; Jones, J. (Univ. of Texas, Austin). *Energy User News;* 7: No. 32, 14(9 Aug 1982).

Mastermetering was popular when energy costs were low, but landlords can no longer raise rents fast enough to keep up with rising utility costs. Individual metering and submetering are a growing trend in Texas in order to regulate cash flow and keep rents competitive. Individual metering encourages conservation, but reduces the owner's incentives to improve building efficiency. Owners may not have the capital to cover submetering costs. A variety of heating and cooling monitors, volumetric meters, time meters, temperature monitors, and contract submetering are among the available options. The Residential Utility Billing System, which charges tenants a fixed rent plus an energy bill, retains mastermetering, but allows a square foot surcharge for energy use. Two studies show less energy is used with submetering. (DCK)

5227 **DOE seeks audit reform for school, hospital grants.** Betts, M. *Energy User News;* 7: No. 31, 1, 16(2 Aug 1982).

Reforms to improve the quality of government-funded energy audits at schools and hospitals are the result of reported poor performance on the part of some engineers, some of whom are unqualified to make the calculations and recommendations. National Society of Professional Engineer, Professional Engineers in Private Practice Division (NSPE/PEPP) will publish guidelines for hiring auditors and evaluating audits as the major reform. Charges are made that the DOE-recommended audit fee is part of the problem, that clients request audits to justify a planned investment, and that engineers work backward from an attractive payback figure. (DCK)

5228 Service firms eyed for lighting, HVAC control. Fleming, J. *Energy User News;* **7**: No. 31, 1, 7-8(2 Aug 1982).

Consultants and energy-service firms are popular with the owners and operators of restaurants, who don't want to deal with energy management on a daily basis. Monitoring and controlling the heating, ventilating, and air conditioning (HVAC) equipment and the lighting systems are the primary areas for improving efficiency. If employees override control systems or if controls are not updated as equipment and operations change, however, the systems lose their efficiency. The nature of food preparation requires different control arrangements than other commercial buildings. Users report that centralized control centers serving a number of individual franchises are most cost-effective than systems with employee access. (DCK)

5229 Users must take precautions in shared-savings financing. Rakowski, R.R. (RBC Inc., Bridgewater, NJ). *Energy User News;* **7**: No. 31, 18(2 Aug 1982).

Participants in shared-savings financial arrangements should take care that both the energy-management company and the end users are sound risks. Many contractors are unqualified or too inexperienced to make accurate cost calculations or sound equipment decisions. Some contractors have illegally raised prices to compensate for the tax deduction available for conservation equipment. End users should have good base-period information to insure the credibility of their savings figures. Contracts should include mutual obligations guaranties and an integrated source of responsibility. Contract variables include the length of terms, the percentage of savings shared, and equipment-brand agreements. (DCK)

5230 Connecticut vanpool program. Jain, R. (Connecticut Dept. of Environmental Protection, Hartford); Gudaitis, C. *Transportation Quarterly;* **36**: No. 3, 365-375(Jul 1982).

State vanpool programs began in Connecticut in the early 1970s, and represent an ongoing commitment to promote ridesharing among state employees and set an example for the private sector. The growth to over 837 vanpools by 1981 testifies to successful organizing and operating experiences. An overview of how Connecticut established and promoted this program emphasizes the importance of all participants understanding their responsibilities. 5 references. (DCK)

5231 Regulatory policy and economies of scale in the US intercity bus industry. Fravel, F.D. (North Carolina Dept. of Transportation, Raleigh); Tauchen, H.; Gilbert, G. *Transportation;* **11**: No. 2, 173-187(Jun 1982).

After nearly a half century of federal and state regulation, the US intercity bus industry is the subject of proposals that would drastically reduce the extent of governmental control over fare setting, service abandonment, and market entry. An essential requirement for understanding how these regulatory changes might affect the industry is knowing the extent to which economies of scale are present in the provision of intercity bus services. This paper reports on the analysis of economies of scale for both Class I firms and for Class II and III firms. The results show nearly constant returns to scale beyond very-low-output levels but very strong dependence on the mix of charter and regular-route service provided. 16 references, 2 figures.

5232 USA: 11 years improving energy efficiency. *Energy Detente;* **3**: No. 6, 1-11(27 May 1982). (In English and Spanish).

Energy efficiency of the US economy has improved steadily for 11 consecutive years, as shown with data processed by Energy Detente. Between 1970 and 1981, the energy required to produce one constant dollar of goods and services has been reduced by 25.2% and experts expect further reduction in 1982. The same thing is happening in all industrialized countries. If this trend continues and if the world economy recovers in 1983, the developed world will experience times of economic growth without a corresponding increase in energy consumption. If this happens, it would be several years before energy consumption in industrialized countries reaches 1979 levels. However, North America has been doing other things that are promising for OPEC's destiny: Canada's private sector not participating in the Alsands and Cold Lake megaprojects; the political undermining of the Synthetic Fuel Corp. in the US; retrea Exxon from the Colony (oil shale) project; cancelling or delay other lesser syncrude projects when oil prices dropped sligh delay of the Alaskan gas pipeline; and possible extension of time development of the Orinoco Oil Belt in Venezuela. Brief summa of energy activities in several Latin American countries and Can are included. Also, the fuel price/tax series is updated for West Hemisphere countries.

5233 Builders go underground. McGrath, D.J. *Vent (New York);* **4**: No. 1, 48-51(Jan 1982).

The appeal of earth-sheltered housing increased last y when 1000 new underground houses brought the national total about 5000. Innovative construction and management techniq help, such as the Terra-Dome's moldset and equipment, which company sells to builders under a license arrangement. Attentio given to aesthetic appeal as well as to energy savings. The Ev strong company builds all-wood underground houses to cut do on humidity and increase resistance to natural disasters. Tight mo gage money has been a serious problem for underground as well conventional builders. (DCK)

5234 Administration budget cuts in conservation a solar programs. Hearings before the Subcommittee on Ene Conservation and Power of the Committee on Energy a Commerce, House of Representatives, Ninety-Seventh C gress, First Session, December 1, 2, and 3, 1981. Washingt DC; Government Printing Office (1982). 174p.

Three days of hearings on the impact of the Reagan bud on solar and conservation programs were held in the Denver, L Angeles, and San Francisco areas, which have led the nation promoting and developing new energy sources. The new bud allots $1.2 billion, or 74%, for nuclear technologies and only $ million, or 8%, for solar and conservation - with another 25% threatened. The discrepancies between subsidies granted to the gas, and nuclear and those granted to solar and conservation in cate that a sound energy policy would eliminate all subsidizati The testimony of 28 witnesses presents the views of state and lo governments, energy companies, universities, laboratories, and terest groups. (DCK)

5235 Department of Energy Fiscal Year 1983 authori tion (conservation programs). Hearing before the Subcomm tee on Energy Conservation and Supply of the Committee Energy and Natural Resources, United States Senate, Nine Seventh Congress, Second Session, March 30, 1982. Washi ton, DC; Government Printing Office (1982). 677p.

Hearings to review the DOE's 1983 budget request for million for conservation programs examined the allocation of $1 million for multi-sector research and development programs $4.3 million for state and local programs. The request represent 97% reduction from the 1981 budget, and a virtual termination federal participation in conservation policy. Principal witnesses the hearing were J.H. Gibbons of the Office of Technology Ass ment, D.H. Moultor of the Energy Conservation Coalition, Lo Roddis of the DOE Energy Research Advisory Board, and Tribble of the DOE Conservation and Renewable Energy off Concern over the administration's request was tempered by high level of investment in past years which is now producing d onstration data. Tribble also noted that energy prices, not fed programs, led to 95% of the energy conservation effort since 19 The hearing record includes seven statements and additional st ments and communications submitted for the record. (DCK)

5236 Homeowner's energy investment handbook: a gu to energy-efficient home improvement that pay off. McC tock, M. Andover, MA; Brick House Publishing Compa Inc. (1982). 125p. Brick House Publishing Co., Inc., Essex Street, Andover, MA 01810, $8.95.

The homeowner wishing to increase energy efficiency find detailed guidelines for identifying problem areas, calcula the costs of individual investments, and comparing the benefits other types of investment so that the most cost-effective steps be taken first. The worksheets, simple instructions for measu and computing, are designed to help the owner make conserva

improvements that are independent of each other but that make a contribution to the structure's thermal efficiency. The appendix compares consumption data for electric appliances and automobiles and summarizes federal and state energy tax credits. 11 references, 2 figures, 5 tables. (DCK)

5237 **Energy engineering and management for building systems.** Coad, W.J. New York, NY; Van Nostrand Reinhold Company (1982). 285p. Van Nostrand Reinhold Co., 135 West 50th St., New York, NY 10020.

The latest technology, economics, and engineering concepts (including thermodynamics) are applied to the management and engineering of energy systems for buildings. Interactions between energy and the economy are discussed to provide greater fuel efficiency and cost-effectiveness. Energy audits are considered in detail with the aim of maximum energy conservation. A detailed analysis is provided of energy-conservation systems; case histories are provided to illustrate practical applications. Among specific items discussed are energy-transportation practices, use of computers, fuel-saving design options, cogeneration, two-phase fluid heat transfer, codes and standards, air systems, and maintenance management. Throughout, the maintaining of the proper engineering philosophy or attitude is stressed. (MJJ)

5238 **Today's architectural mirror: interiors, buildings, and solar designs.** Heyne, P. New York, NY; Van Nostrand Reinhold Company (1982). 188p. Van Nostrand Reinhold Company, 135 W. 50th Street, New York, NY 10020 $32.50.

An architect explains why the mirror is one of today's most popular architectural materials, covering building interiors as well as exteriors. She uses over 200 illustrations, and gives an historical rundown on the mirror's use throughout history, mirror lore, mirror fabrication, and design techniques. The glass building clad in one-way mirrors is analyzed in terms of energy pluses and minuses, as well as aesthetics. The best designers are imparting scale to the surface, combining mirrors with other materials, experimenting with various shapes, and cautiously handling reflected shapes. 42 references.

5239 **Checking the energy sector of an enterprise.** Kiss, M. *IO Management-Zeitschrift;* **50**: No. 5, 251-253(1981). (In German).

As the energy prices keep increasing and maybe there shall be difficulties of supply, it shall be necessary for the managing directors of any enterprise to develop an energy plan in order to secure the production and the competitive power of their products in the long term. The first step towards such an energy plan could be an energy conservation programme. It could comprise measures for reducing the energy demand, for diminishing the energy distribution losses and for increasing the efficiency in power generation. A checklist for the setting-up and utilization of an operational energy conservation system is given. It analyzes the actual state of equipment, defines the targets, checks saving measures, estimates the savings and investments and sets priorities for the introduction of the saving programme.

5240 **Measures of economic policy for energy conservation in private households.** Luhmann, H.J. *Hauswirtschaft und Wissenschaft;* **29**: No. 5, 263-272(1981). (In German).

Starting from the fact that the energy consumption of the private households in the F.R. of Germany amounts to ca. 35% of the final energy consumption the economic importance of the energy consumption in households is pointed out by a number of figures. A presentation of the political means with which the households are to be made behave in an energy-saving way, i.e. towards the substitution of energy by capital, is following. These measures of economic policy are related to individual transport and to direct household energy. There are three important political approaches having shown some effects all over Germany which influence the energy consumption in households. They are discussed here: the energy conservation law (EnEG), the modernization and energy conservation law (ModEnG) and the amendment of the Federal power tariff regulation (BTO Elt).

5241 **Energy conservation ideas for lighting systems.** Harrold, R.M. *American Institute of Industrial Engineers, Detroit Chapter, Proceedings of the Annual Conference;* 73-80(1981). (CONF-810538—). Detroit, MI, USA (17 May 1981).

Calculation procedures for establishing power limits for lighting systems are described. Details of a survey, or audit of spaces in a building, which provide background data for determining in which areas energy may be saved, are presented. Evaluation points examined are lighting needs, equipment efficiency, use of daylighting controls, maintenance procedures, and operating schedules.

5242 **Consumer's energy handbook.** Norback, P.; Norback, C. New York, NY; Van Nostrand Reinhold Company (1981). 368p. Van Nostrand Reinhold Co., 135 West 50th St., New York, NY 10020 $14.95.

Facts, figures, and detailed explanations are compiled to help consumers make their homes energy efficient, take advantage of current legislation and anticipated future legislation, or to locate a manufacturer or state energy office. Special guidelines pinpoint planning and designing features for home insulation. The Handbook evaluates the economic and technological aspects of various energy sources as well as examining the effects of their use. The book concludes with a summary of the National Energy Act and a glossary of over 500 energy-related terms. 89 references, 36 figures, 42 tables.

5243 **Experience of energy conservation in buildings.** Sherratt, A.F.C. (ed.). London, England; Construction Press (1981). 188p. Construction Press, Longman House, Burnt Mill, Harlow, Essex, England.

Almost half of the total energy consumption in the developed world is used to control environment inside buildings - even small-percentage savings must produce big dividends overall. Nevertheless, people in general are hardly aware of the importance of conserving energy used in buildings, even though all of them contribute to that use, both in their own homes and in buildings in which they work. The examples of active policies and real efforts to save energy described in this book give valuable information, data, and ideas for anyone engaged in an energy-conservation exercise or even just thinking about it. Case studies are placed in perspective by chapters on the world and national energy situation, economics, and the use of energy targets. Depth is ensured by chapters discussing especially important subjects such as thermal insulation, heat recovery, and lighting, with a special look at energy-conservation achievements in the USA. Chapter titles and authors are: The Energy Situation, J.H. Chesters; Energy Targets for Buildings, J. Peach; The Economics of Energy Use and Conservation, P.C. Venning; Energy Conservation in a Store Group, C.W. Huxley; Energy-Conservation Performances in Local Authority Buildings, D.N. Morris; Energy Conservation and the Developer - a Personal View, A.N. Boardman and H.J. Day; The Role of Thermal Insulation, P.V.L. Barrett and J. Gillett; Heat-Recovery Systems and Possibilities, R.H. Rooley; Energy Saving and Lighting, J.E. Baker; Energy Conservation Achievements in the USA, J.B. Chaddock; Photoelectric Control of Lighting - Case Studies, V.H.C. Crisp; and A Personal View of the Future, J.M. Cooling.

5244 **Earth sheltered homes plans and designs: Underground Space Center, University of Minnesota.** Ahrens, D.; Ellison, T.; Sterling, R. New York, NY; Van Nostrand Reinhold Ccmpany (1981). 125p. Van Nostrand Reinhold Company, 135 W. 50th Street, New York, NY 10020 $9.95.

Detailed construction information, plans, and energy data for 23 successful earth-sheltered homes throughout the US and Europe illustrate that such homes can be aesthetically pleasing as well as ecologically sound. Gross area, materials for construction, type of earth cover, method of insulation, and waterproofing techniques are all included in data sheets and charts that accompany a full description of each house. Comprehensive plans and over 250 photographs of both interior and exterior views demonstrate how attractive and comfortable the houses can be.

5245 **Municipal solar utility: a model for Carbondale, Illinois.** Robertson, C.; Besal, M.; Shick, J.R.; Strange, L.D. Chicago, Illinois; Institute of Natural Resources (1981). 281p. Shawnee Solar Project, 211-1/2 West Main, Carbondale, IL 62901.

Two major problems that inhibit the deployment of energy conservation measures and the use of renewable energy resources in existing buildings are: (1) lack of precise information from a credible, unbiased source about energy needs and conservation/renewable energy options, and (2) lack of accessibility to capital for energy-related building improvements. This report was prepared to provide local government officials with a model for a program that can alleviate these barriers. It is focused on the needs of Carbondale, Illinois, and also contains discussions of transferability of the model to other Illinois communities. The model describes a program that is designed to meet local energy needs, is funded by local resources, and is locally controlled. Such a program will involve the public and private sectors in a new set of relationships that will strengthen the local economy, provide jobs for local residents, and encourage local growth and economic development by reducing the amount of energy consumed in buildings. This will decrease the amount of money spent for energy and insulate the city and its residents from the effects of inevitable future energy-price inflation. 150 references, 12 figures.

5246 **Design connection: energy and technology in architecture.** Crump, R.W.; Harms, M.J. (eds.). New York, NY; Van Nostrand Reinhold Company (1981). 200p. Van Nostrand Reinhold Company, 135 W. 50th Street, New York, NY 10020.

Preston Thomas Memorial Series in Architecture.

Six prominent architects probe the relationship of formal architectural design to both building technology and human values. Examining the history of architecture in terms of human, material, and technological resources, they shed new light on the search for responsible new designs in today's era of rapid societal change, shrinking physical resources, and economic and political retrenchment. The essential area of energy conservation is scrutinized in detail. The book focuses on design in its broadest and most fundamental sense, and on ways to use architecture to enrich people's lives. Locational, climatic, cultural, and historical viewpoints are all considered in depth. Among the major topics covered are the development of sun rights codes in cities, the design of ecologically autonomous communications, and the interplay between high-tech and energy-conscious architecture. Examples span from indigenous architecture of the Southwest Indians to modern office buildings. 119 figures.

2920 Supply, Demand, And Forecasting

REFER ALSO TO CITATION(S) 5048, 5049, 5051, 5052, 5053, 5135, 5243, 5310, 5319, 5372

5247 **(AD-A—105629) Value tree analysis of energy supply alternatives.** Stillwell, W.G.; Vonwinterfeldt, D.; John, R.S. (University of Southern California, Los Angeles (USA)). Jun 1981. 41p. NTIS, PC A03/MF A01.

The use of value trees in multiattribute evaluations of energy supply alternatives was examined. A value tree relating general values and concerns to specific value relevant attributes was constructed to compare three energy options: nuclear, coal, and a combined geothermal and conservation package. Both hierarchical and non-hierarchical weighting procedures were used to rate the energy options. Several additive multiattribute models were constructed and compared with holistic rankings and ratings of the three options. Three basic findings were: (1) hierarchical weights were steeper than non-hierarchical weights (2) groups identified by their holistic first choice showed substantial agreement in their assessment of attribute weights (3) convergence of MAU model parameters resulted in a common model , consistent with holistic evaluations of the pro-conservation group, and generally inconsistent with those of the pro-nuclear group. This differential consistency between model composites and holistic evaluations is interpreted as a result of weight parameter distortions due to social desirability and a neglect to consider attribute value ranges when making weight judgments.

5248 **(AECL—7429) Canadian heavy water production, 1970 to 1980.** Galley, M.R.; Bancroft, A.R. (eds.). (Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.). Oct 1981. 113p. (CONF-811007—). NTIS (US Sales Only), PC A06/MF A01. Order Number DE82780745.

From 2. world congress of chemical engineering; Montreal, Canada (4 Oct 1981).

Separate abstracts are included in the data base.

5249 (CONF-8110215—, pp 155-161) **Illinois and energy: a need for new partnerships.** Massey, W.E. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The author discusses long-range need for research and development for assuring stable energy supplies. (PSB)

5250 **(EUR—7692-EN) Medium-term energy-demand studies and model improvements. Final report.** (Cambridge Econometrics Ltd. (UK)). 1982. 182p. CEC, Information Market and Innovation, Luxembourg. Order Number DE82906195.

This final report covers case studies and improvements to the European Communities Energy Systems Modelling System. The report is made up of the following four sections: case studies and model improvements for the Netherlands; case studies for France; case studies for the United Kingdom; and model improvements. The implementation and development of the European Communities (EC) medium term energy modelling systems for the Netherlands, France, and the United Kingdom are described. The structure of the models and case studies used to test them are outlined. The results of the case studies are also described and compared with internal Dutch, French, and British forecasts where this is possible. Finally, in light of the results of the case studies further improvements to the medium term model structures are discussed. Research on improved models of energy demand included studies on disaggregated import functions, long run/short run elasticities for total energy demand, and different mechanisms for taking account of dynamic effects in simultaneous fuel substitution models.

5251 **(LA—9485-MS) DoD energy vulnerabilities: potential problems and observations.** Freiwald, D.A.; Berger, M.E.; Roach, J.F. (Los Alamos National Lab., NM (USA)). Aug 1982. Contract W-7405-ENG-36. 52p. NTIS, PC A04/MF A01. Order Number DE82021140.

The Department of Defense is almost entirely dependent on civilian energy supplies to meet its needs in both peacetime and periods of heightened conflict. There are a number of potential vulnerabilities to the continual and timely supply of energy to both the civilian and military sectors. These include denial of the energy resources themselves, disruption of critical transportation networks, destruction of storage facilities, and interruption of electrical power. This report briefly reviews the present situation for provision of energy from the civilian sector to the military. General vulnerabilities of the existing energy supply system are identified, along with the potential for armed aggression (including terrorist and sabotage activities) against the energy network. Conclusions and some tentative observations are made as to a proper response to the existing vulnerabilities.

5252 **(NP—2903984) Local energy initiatives: a second look. A survey of cities and counties, California 1981.** Tomasi, T. (California State Office of Appropriate Technology, Sacramento (USA)). 1981. 127p. NTIS, PC A07/MF A01. Order Number DE82903984.

The survey results document momentum at the local level to reduce energy costs and boost reliance on alternative, renewable energy sources. California cities and counties have designed and implemented cost-effective, environmentally sound energy practices in internal management and resource development, and in the fields of planning, land use, transportation, and education. Examples are given of the use of alternative technologies to make future energy

secure and protect the economic and environmetnal well-being of California communities.

5253 **(SERI/TR—211-1669) Analysis of Air Force base energy acquisition through third-party contracts.** Sklar, H.; Noun, R. (Solar Energy Research Inst., Golden, CO (USA)). Jul 1982. Contract AC02-77CH00178. 51p. NTIS, PC A04/MF A01. Order Number DE82020419.

A new class of utility service contracts is examined for supplying energy to Air Force bases under which the Air Force agrees to purchase energy and the contractor agrees to finance, design, construct, operate, and maintain a dedicated power plant. Such agreements are often referred to as third-party contracts. Third-party contracting issues are identified and analyzed and background is provided for Air Force personnel considering or negotiating third-party contracts. Economic incentives available to contractors are explained, an overview of third-party contracting is presented and specific issues discussed. Current military activities and plans are summarized. A case study of an Air Force Academy project is presented. It is concluded that third-party contracting will require a different approach to energy procurement and that the opportunity should exist for a successful contractor to realize a reasonable return on his investment. Items for inclusion in contracts, topics for further study, and Air Force actions to encourage third-party contracting are recommended.

5254 **(UT/CES-PS—18) Energy strategies of Western Europe in the 1980s: dependable supplies versus security implications.** Hoffman, G.W. (Texas Univ., Austin (USA). Center for Energy Studies). Jul 1982. 134p. NTIS, PC A07/MF A01. Order Number DE82021529.

The basic aim of this study is to emphasize the various strategies available to the countries of Western Europe when dealing with problems connected with their energy dependence and their effort to secure dependable supplies. The first part of the study focuses on the historical trends and the nature and extent of the energy problems in Western Europe since 1973. The various alternative strategies available for securing more dependable energy supplies for the Western European countries are analyzed in the second part. The last part of this study analyzes the problem of securing dependable energy supplies and their various security implications. Special attention is given to motives of the Soviet Union in proposing the natural gas pipeline project and those of the West European countries in accepting sizeable increases in their gas imports from the Soviet Union. Special attention is given to the concern voiced by the United States for the impact of Soviet gas deliveries to the NATO alliance. These discussions emphasize issues affecting both the economic security and political autonomy of the West European countries and the future alternatives available to them. (PSB)

5255 **Traditional fuel usage and the rural poor in Bangladesh.** Douglas, J.J. *World Development;* **10**: No. 8, 669-676(Aug 1982).

Food and fuel production in the rural environment of developing countries are linked to income, and both are fundamental to welfare. It is difficult to measure the condition of the overall traditional fuel resource, but in Bangladesh the usage of village trees can be used as an indicator. Traditional fuel consumption per capita in the country seems to be more or less what would be expected for a country of this type, but it also seems that, at these levels of usage, serious shortages must soon appear. Because of the existing socio-economic structure of the rural population, the poor, landless stratum will be disproportionately affected by such shortages. Within the political and implementation constraints that exist, certain steps can be taken to offset the fuel shortage. These might at least include the rural poor, if not distributing all benefits directly to them. 15 references, 3 tables.

5256 **Demand for gasoline for usage by passenger cars.** Fishelson, G. (Univ. of Chicago, IL). *Resources and Energy;* **4**: No. 2, 163-172(Jun 1982).

This paper examines the behavioral relationships that determine the consumption of gasoline per capita via the usage of passenger cars. The variables encountered are the number of cars per capita, the miles driven per car, and the miles driven per gallon of gasoline. These variables are explained by the price of gasoline, the price of cars, the gross national product per capita, and the lagged corresponding variables. The important result that emerges is that the long-run elasticity of demand for gasoline is about unity. 12 references, 1 figure, 2 tables.

5257 **Primary energy consumption reduced and electric power consumption stagnating in EC countries in 1981.** Gabel, R. *Glueckauf;* **118**: No. 7, 374-377(8 Apr 1982). (In German).

The structural change in primary energy consumption by EC countries, which had been induced by the first oil crisis, has continued in the period under report. For the first time, petroleum consumption amounted to less than 50% in 1981 while natural gas consumption had nearly doubled and nuclear power consumption nearly quadrupled as compared with 1973. Bituminous coal has been able to defend its position these nine years, in spite of primary energy consumption varying and falling below the 1973 level. Similar trends have been seen in electric power generation, which accounts for one third of the total primary energy consumption. Here, too, a shift can be seen in favour of nuclear power and at the expense of petroleum. Natural gas consumption first increased but then fell below the 1973 level. Hard coal has reached a better position in electric power generation since the first oil crisis. With more than 34%, it has become the main energy source of the EC power industry.

5258 **Energy crisis of 1981: does it exist.** pp 27-41 of Energy policy in perspective - solutions, problems, and prospects. Spurr, S.H. (ed.). Austin, TX; University of Texas (1982).

From Energy policy in perspective - solutions, problems, and prospects symposium; Austin, TX, USA (12 Feb 1981).

The panel discusses the reality of the petroleum shortage and how to guard against an energy crisis by storing petroleum and seeking alternative sources. (PSB)

5259 **Energy decade 1970-1980: a statistical and graphic chronicle.** Liscom, W.L. (ed.). Cambridge, MA; Ballinger Publishing Company (1982). 571p. World Energy Industry Information Services, 4202 Sorrento Valley Boulevard, San Diego, CA 92121.

This book presents a complete graphic and statistical portrait of the dramatic shifts in global energy flows during the 1970s and the resultant transfer of economic and political power from the industrial nations to the oil-producing states. The information was extracted from government-source documents and compiled in a computer data base. Computer graphics were combined with the data base to produce over 400 full-color graphs. The energy commodities covered are oil, natural gas, coal, nuclear, and conventional electric-power generation. Also included are data on hydroelectric and geothermal power, oil shale, tar sands, and other alternative energy sources. 72 references.

5260 **Food and energy: challenges and choices.** McFate, K.L. (Univ. of Missouri, Columbia). *Energy in Agriculture;* **1**: No. 1, 91-98(Nov 1981).

The concerns about potential energy shortages and food shortages are addressed relative to needs of an increasing world population. Interacting relationships between available energy supplies and food supplies are reviewed from different aspects, including the increasing competition for water and land as such relate to energy, crop, and livestock production. This overview should aid researchers, producers and consumers to better understand the complexities in making choices to meet the challenge of assuring ample amounts of energy to produce food in optimum quantities. 13 references, 3 figures.

5261 **USAID report Energy in Irrigation in Developing Countries.** Smerdon, E.T. (Univ. of Texas System, Austin); Hiler, E.A. *Energy in Agriculture;* **1**: No. 1, 99-107(Nov 1981).

This report provides data on the general magnitude of energy requirements for various types of irrigation systems supplied from surface water or groundwater sources. The surface-irrigation

systems require the least energy to operate and are also the least expensive to construct. Therefore, in developing countries when soil and topographic conditions permit and when the system is well designed and managed, the use of surface irrigation is the best choice from both energy- and monetary-cost considerations. Above all, the water losses in irrigation should be reduced insofar as possible so that the energy invested in providing the supply and pumping the water is not wasted. Although alternate renewable energy sources may serve irrigation in developing countries, many technological and economic problems remain to be solved before widespread use of alternate energy sources can be expected. 11 references, 1 figure.

5262 **Perspectives of worldwide energy supply.** *Analysen;* No. 7, 1-15(Jul 1981). (In German).

World energy demand will continue to increase in spite of energy conservation measures of the industrialized countries: One reason for this is the expected increase of the world population from some 4,000 million today to almost twice this number. If the energy supply problem of these people, especially in the developing countries, cannot be solved, the world will be threatened by an unimaginable economic and sociopolitical fight over the scarce resources. There are no simple solutions to this problem, and experiments may be fatal. Politicians have failed to make the necessary decisions in energy policy. It is five minutes to twelve: Time for action, and let it be fast action. Strong and far-reaching measures are required in energy conservation, coal and nuclear power, and renewable energy sources. We do have the know-how and the means to meet the rising energy demand and still consider ecological and sociopolitical aspects, but this will require a high degree of international cooperation. It is our one chance, and we ought to take it.

5263 **Energy and security.** Nye, J.S. *Europa Archiv;* **36**: No. 8, 227-238(25 Apr 1981). (In German).

Starting from the fact that more than half of the petroleum sold via the world trade comes from one of the politically most unstable regions of the world at the Persian Gulf, the author tries to assess the economic damage which would be evoked if the petroleum supply was interrupted for a longer period. He discusses measures for reducing the dependence on imports and describes precautions against crises. Finally it will be important to combine domestic military measures and measures of foreign policy in order to secure a successful energy strategy.

5264 **Inter-energy substitution in Korea, 1962 to 1975.** Shin, E. Pasadena, CA; California Institute of Technology (1981). 23p. California Institute of Technology, Division of the Humanities and Social Sciences, Pasadena, CA 91125.

Oil made up only 8.2% of Korea's total energy consumption in 1962, but rose to 52.7% by the end of the second five-year economic development plan in 1971. A major reason for the change in the composition of energy consumption through time was the change in the relative price of energy sources. This paper uses a translog unit cost function to examine the substitution possibilities among electricity, oil, and coal in Korea. The 1962-1975 aggregate national time-series data show that the three energy sources are all substitutable, and that electricity and coal are the best substitutes. 15 references, 4 tables.

5265 **'Decoupling' of economic growth and energy consumption - a new strategy of energy policy or merely a new.** Horn, M. *Energiewirtschaftliche Tagesfragen;* **29**: No. 3, 144-152(Mar 1979). (In German).

The relations between the economic development and energy consumption is explained and their complexity is pointed out. The development of the official energy prognoses since 1973 and the development of economic growth and energy consumption from 1951-1976 show that these two developments had been linked together during certain periods but that the coefficient of elasticity shows a falling trend in the long term. The parameters determining the relation between economic growth and energy consumption are discussed: energy prices, capacity load, investments and technological innovations. At the same time the limits of a possible decoupling are demonstrated.

5266 **(DOE/IA/10150—T1) Foreign energy supply assessment and program (FESAP).** (Anathon Corp., Boston, MA (USA)). [nd]. Contract AC01-81IA10150. 311p. NTIS, PC A14/MF A01. Order Number DE82014492.

Portions of document are illegible.

The in-place oil and gas potential for Libya and Egypt have been calculated. This includes both the discovered and undiscovered hydrocarbon resources. The area was subdivided into its geological basins for which the resources were calculated. For offshore areas the calculations included an area out to a water depth of 200 meters.

2930 Policy, Legislation, And Regulation

REFER ALSO TO CITATION(S) 5049, 5062, 5077, 5096, 5097, 5100, 5152, 5153, 5168, 5199, 5210, 5211, 5247, 5248, 5263, 5308, 5311, 5312, 5353, 5355, 5379, 5402, 5431, 5452

5267 **(CONF-8110215—) Illinois energy policy: new directions for the eighties. Proceedings of the ninth annual Illinois energy conference.** (Illinois Univ., Chicago (USA). Energy Resources Center). 1981. Contract FG01-81FE16116. 167p. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

Individual papers are included in the data base. (PSB)

5268 (CONF-8110215—, pp 16-20) **Taxation, incentives and fiscal policy.** Toder, E.J. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper discusses general perspectives on tax policy toward energy markets and the relationship of potential changes in energy tax policy to the Administration's overall economic, energy, and tax policies. Discussion centers around special tax incentives for energy production and conservation through their history and reasons for enactment. It concludes that these incentives are now obsolete. (PSB)

5269 (CONF-8110215—, pp 21-24) **Natural resources and the environment.** Russell, D. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

Policy changes under Interior Secretary James Watt are reviewed. Examples are the 5-year oil and gas leasing program on the Outer Continental Shelf with a purpose to achieve national energy independence from foreign sources. The local use of geothermal energy as well as the current philosophy on wilderness preservation are also discussed. (PSB)

5270 (CONF-8110215—, pp 76-81) **Deregulation of natural gas prices.** Eberst, C.R. Jr. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

Issues are discussed which surround natural gas price deregulation and recent legislative proposals to decontrol natural gas. Past legislation as well as current law is reviewed in the light of the current political climate. (PSB)

5271 (CONF-8110215—, pp 128-133) **Impact of new energy policies on Illinois industry.** Ranney, G.A. Jr. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper discusses the plan for managing Illinois' mineral resources to obtain maximum economic growth, and the education needed for wise decision making for policy directions. (PSB)

5272 (CONF-8110215—, pp 138-140) **Illinois Office of Coal Commerce.** Castle, J.W. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The marketing efforts of Illinois are reviewed. (PSB)

5273 (CONF-8110215—, pp 143-149) **New energy approach: let the people decide.** Chiles, J.H. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The policy of this administration for letting the free market determine energy demand and thereby supply is discussed. Through such a policy the American people will balance factors of convenience, price, availability, environmental concerns, and reliability of supply among other things before choosing an individual energy source. No panacea is promised. (PSB)

5274 **(NP—2018198) Save it, Florida: annual report to the Legislature 1981.** (Florida Governor's Energy Office, Tallahassee (USA)). Nov 1981. 60p. Governor's Energy Office, 301 Farris Bryant Building, 620 S. Meridian St., Tallahassee, FL 32304. Order Number DE82018198.

Including a report on electric and natural gas utility energy activities by the Florida Public Service Commission.

The following aspects of Florida's energy program are reported: Florida's energy situation-1981, organization and funding, responsibilities and accomplishments, and recommendation. The report of the Public Service Commission is included.

5275 **(NP—2905974) 1981 legal report of oil and gas conservation activities.** (Interstate Oil Compact Commission, Oklahoma City, OK (USA)). 1982. 37p. Interstate Oil Compact Commission, P.O. Box 53127, Oklahoma City, OK 73152. Order Number DE82905974.

Legislative, administrative, and judicial actions are described for 28 states of the USA and for the Canadian provinces of Alberta and British Columbia where significant legal activities dealing with oil and gas conservation during the year of 1981 occurred. The states covered are: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Missouri, Montana, New Mexico, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Texas, Utah, Virginia, and West Virginia. (LEW)

5276 **(NP—2906069) Report to the Missouri General Assembly on hazardous waste management in Missouri.** (Missouri Dept. of Natural Resources, Jefferson City (USA). Hazardous Waste Management Task Force). Sep 1981. 39p. NTIS, PC A03/MF A01. Order Number DE82906069.

Results of a study conducted by the Hazardous Waste Management Task Force are presented. The current hazardous waste situation in Missouri is reviewed. The task force identified 5 major issues and developed 11 recommendations. Issues identified are: development of alternatives to hazardous waste landfills; operation of hazardous waste exchange; Missouri Hazardous Waste Law; Missouri Hazardous Waste Regulations; and funding for hazardous waste programs.

5277 **(RAND/N—1876-DOE) Analysis of the Department of Energy's nonprice regulation of industrial energy use.** Johnson, L.L.; Seidman, D. (RAND Corp., Santa Monica, CA (USA)). May 1982. Contract AC01-80PE70269. 92p. NTIS, PC A05/MF A01. Order Number DE82021642.

This study analyzes Department of Energy regulatory activities within the industrial sector, focusing on nonprice regulations such as prohibitions on specific fuel use. Basic analytic inputs into DOE's decisions about their future regulatory activities are examined.

5278 **(USGS-OFR—81-1256) Permit requirements for development of energy and other selected natural resources for the state of Idaho.** (Dearborn Associates, Inc., Seattle, WA (USA)). Aug 1981. 92p. Geological Survey, Open-File Services Section, Denver Federal Center, Box 25425, Denver, CO 80225. Order Number DE82906245.

This guidebook summarizes environmental and land-use permits issued by the state for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of federal, state, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5279 **(USGS-OFR—81-1257) Permit requirements for development of energy and other selected natural resources for the State of Illinois.** Jones, W.W. (ed.). (Indiana Univ., Bloomington (USA). School of Public and Environmental Affairs). Sep 1981. 68p. Geological Survey, Open-File Services Section, Box 25425, Denver Federal Center, Denver, CO 80225. Order Number DE82906244.

This guidebook summarizes environmental and land-use permits issued by the State for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of Federal, State, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5280 **(USGS-OFR—81-1259) Permit requirements for development of energy and other selected natural resources for the State of Kansas.** Forrest, A.S. (Radian Corp., Austin, TX (USA)). Jul 1981. 91p. Geological Survey, Open-File Services Section, Box 25425, Denver Federal Center, Denver, CO 80225. Order Number DE82906243.

This guidebook summarizes environmental and land-use permits issued by the State for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of Federal, State, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5281 **(USGS-OFR—81-1261) Permit requirements for development of energy and other selected natural resources for the State of Louisiana.** Carow, J.S. (Radian Corp., Austin, TX (USA)). Jul 1981. 80p. Geological Survey, Open-File Services Section, Box 25425, Denver Federal Center, Denver, CO 80225. Order Number DE82906242.

This guidebook summarizes environmental and land-use permits issued by the State for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of Federal, State, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Per-

mits administered by a single agency are generally grouped together in each section. (PSB)

5282 **(USGS-OFR—81-1262) Permit requirements for development of energy and other selected natural resources for the State of Maryland.** Lawson, B. (Lawson (Barry) Associates, Inc., Boston, MA (USA)). Sep 1981. 60p. Geological Survey, Open-File Services Section, Box 25425, Denver Federal Center, Denver, CO 80225. Order Number DE82906296.

This guidebook summarizes environmental and land-use permits issued by the State for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of Federal, State, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5283 **(USGS-OFR—81-1266) Permit requirements for development of energy and other selected natural resources for the State of Mississippi.** (Lawson (Barry) Associates, Inc., Boston, MA (USA)). Sep 1981. 73p. Geological Survey, Open-File Services Section, Box 25425, Denver Federal Center, Denver, CO 80225. Order Number DE82906240.

This guidebook summarizes environmental and land-use permits issued by the State for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of Federal, State, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5284 **(USGS-OFR—81-1269) Permit requirements for development of energy and other selected natural resources for the state of New Mexico.** (Camp Dresser and McKee, Inc., Wheat Ridge, CO (USA)). Aug 1981. 71p. Geological Survey, Open-File Services Section, Denver Federal Center, Box 25425, Denver, CO 80225. Order Number DE82906239.

This guidebook summarizes environmental and land-use permits issued by the state for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of federal, state, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5285 **(USGS-OFR—81-1270) Permit requirements for development of energy and other selected natural resources for the state of New York.** (Lawson (Barry) Associates, Inc., Boston, MA (USA)). Sep 1981. 74p. Geological Survey, Open-File Services Section, Denver Federal Center, Box 25425, Denver, CO 80225. Order Number DE82906238.

This guidebook is to summarizes environmental and land-use permits issued by the state for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of federal, state, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5286 **(USGS-OFR—81-1274) Permit requirements for development of energy and other selected natural resources for the state of Ohio.** (Lawson (Barry) Associates, Inc., Boston, MA (USA)). Sep 1981. 54p. Geological Survey, Open-File Services Section, Denver Federal Center, Box 25425, Denver, CO 80225. Order Number DE82906250.

This guidebook summarizes environmental and land use permits issued by the state for the development of energy and other natural resources. The guidebook is intended not only for private developers and interest groups, but also for regulatory officials of federal, state, and local government as well. The guidebook is divided into seven sections: Introductory Information; Consolidated Permit Programs, Local Regulatory Policies; Resource Extraction; Land Use Regulation; Environmental Quality Management; and Social/Ecological Preservation. Each section is divided into chapters; each chapter summarizes one permit, license, or approval. Permits administered by a single agency are generally grouped together in each section. (PSB)

5287 **Determining the public-utility status of nonconventional enterprises.** Nolan, P.V. *Public Utilities Fortnightly;* **110**: No. 2, 53-57(22 Jul 1982).

Several recent case histories illustrate the process of conferring public-utility status on nonconventional activities. Munn v. Illinois established grain storage as a public utility because grain-elevator operators have a virtual monopoly. Other utility-like status was conferred upon American Cyanamid Company's waste treatment facility in New Jersey, Apartment Metering Plan's (AMP of Texas) services to apartment complexes, United Illuminating Company's joint ownership with Prulease Inc. and Southern California Edison's joint venture in a coal-gasification combined-cycle demonstration project. Decisions in the rulings were based on the company's structure, its position as owner or lessor, and the degree of public interest and public use involved. (DCK)

5288 **European energy strategy.** Davignon, E. *Elektrizitaetswirtschaft;* **81**: No. 11, 351-354(24 May 1982). (In German).

The weak point of Europe remains the immense susceptibility on the energy sector. Half of the European supply depends on imports and it is still the world's number one importer of crude oil. Whereas the oil price constantly increases, capital investment, the key to our security, is influenced by a multitude of precarious factors. For example the evolution of prices, taxation, the technological risks, profitability factors and public reaction. In this decade the investment in energy in the EEC nations will amount to 2.2% of the gross domestic product, at best. In contrast, Japan will invest between 3 and 3.5% of its domestic product in energy and the United States 4%. In solving this comprehensive economic problem, the energy strategy plays a major role. In the opinion of the European Commission this does signify that jointly coordinated activities can be executed. To secure the energy supply and to secure the future of the economy, the member nations and the Community must concentrate all efforts on joint goals. By the year 1990 a total of approximately 1.200 to 1.800 billion DM will be required to finance the investment necessary for the diversification of energy sources and for conserving energy.

5289 **Mitteilung der Kommission der Europaeischen Gemeinschaften ueber eine Stromversorgung der Gemeinschaft und Verwendung von Oel zur Stromerzeugung. (Bulletin of the Commission of the European Communities on the power supply of the EC and the use of petroleum for power generation).** Bonn, Germany, F.R.; Heger (29 Mar 1982). 2p.

The recommendation says that the German Bundestag expects the European countries to establish more coal power plant capacities in order to diminish the Community's dependence of petroleum for power generation. The report of the referee of the Committee for Economic Affairs provides the necessary background.

5290 **Federal investment aids to the industry for petroleum substitution by solid fuels.** *Technologie-Nachrichten Programm-Informationen;* No. 276, 1-16(1 Mar 1982). (In German).

Possibilities of receiving financial aid by the state for petroleum substitution measures and for the investments for environmental protection which are often necessary.

5291 **Canadian energy policy: a producer's point of view.** *Energy Detente;* **3**: No. 1, 1-9(12 Jan 1982). (In English and Spanish).

Canada possesses abundant petroleum sufficient for decades to come. However, the provinces which legally own the resources have engaged in explosive and recurring debate with the federal government over ownership versus control. The traditionally conservative producing provinces press for supply-side energy policy, while the Liberal Administration opts for emphasis on controlling demand. A map illustrates that the West is the principal supplier to the East - where industry, commerce, and the federal electorate are concentrated. But as producers, the producing provinces have a negotiating power verging on that of the petroleum-exporting nations: they can set production levels. This issue is devoted mostly to a report by James R. Hart, resource analyst of the Alberta Petroleum Marketing Commission, who provides a producing province's viewpoint of Canadian energy policy. This issue gives tables showing the Energy Detente hydrocarbon price series for Western Hemisphere countries.

5292 **Energy policy in perspective - solutions, problems, and prospects.** Spurr, S.H. (ed.). Austin, TX; University of Texas (1982). 71p. (CONF-810286—). University of Texas at Austin, Lyndon B. Johnson School of Public Affairs, Austin, TX 78712. Order Number DE82904419.

From Energy policy in perspective - solutions, problems, and prospects symposium; Austin, TX, USA (12 Feb 1981).

Individual panel discussions are included in the database. (PSB)

5293 **History of energy policy development.** pp 1-26 of Energy policy in perspective - solutions, problems, and prospects. Spurr, S.H. (ed.). Austin, TX; University of Texas (1982).

From Energy policy in perspective - solutions, problems, and prospects symposium; Austin, TX, USA (12 Feb 1981).

The national energy policy is reviewed by a panel through the Roosevelt, Truman, Eisenhower, Kennedy, Johnson, Nixon, Ford, and Carter administrations. (PSB)

5294 **Energy policy for the 1980s.** pp 43-63 of Energy policy in perspective - solutions, problems, and prospects. Spurr, S.H. (ed.). Austin, TX; University of Texas (1982).

From Energy policy in perspective - solutions, problems, and prospects symposium; Austin, TX, USA (12 Feb 1981).

This panel looks at various facets and aspects of energy policy trying to agree on long-term objectives for technological development and economic considerations. (PSB)

5295 **Nuclear energy and proliferation.** Rotblat, J. pp 66-106 of Hazards of the international energy crisis. Carlton, D.; Schaerf, C. (eds.). New York, NY; St. Martin's Press, Inc. (1982).

From 7. course of the international school disarmament and research on conflicts; Ariccia, Italy (18 Aug 1978).

The nuclear fuel cycle is examined to determine how a government could covertly acquire a sufficient amount of fissile material to make a nuclear bomb. The fast breeder reactor is seen as having much greater potential for proliferation than the thermal reactors. The author sees the removal of the threat of horizontal proliferation as the only chance for mankind survival. (PSB)

5296 **Future American energy policy.** Crist, M.S.; Laffer, A.B. (eds.). Lexington, MA; D.C. Heath and Company (1982). 170p. Lexington Books, D.C. Heath and Co., 125 Spring St., Lexington, MA 02173, $18.95.

People from businesses, public life, public advocacy groups, and experts on international energy met in February 1980 to explore the complex issues of energy policy at a conference entitled Energy Future: Policies and Consequences. The book begins with Crist's overview of current options. David Stockman then examines damaging energy myths and their effects in producing misguided energy policies. Other authors explore the social implications of energy policy, the failure of oil-company management and government to keep energy prices in line with costs, the economic implications of domestic energy policy, international attitudes toward US policy, and the implications of alternative energy sources and conservation. Laffer describes how American presidential economic policies differ from public perceptions. The book concludes with the hope of achieving a future balance of environmental concerns and increased production.

5297 **Waste, fraud, and abuse at the Department of Energy. Hearing before a Subcommittee of the Committee on Government Operations, House of Representatives, Ninety-Seventh Congress, Second Session, March 31, 1982.** Washington, DC; Government Printing Office (1982). 56p. GPO.

Charles A. Bowsher, Comptroller General of the US General Accounting Office (GAO) was the principal witness at a DOE performance review of the nation's second largest civilian procurement agency, the Department of Energy. The GAO investigation revealed an unacceptable level of waste and poor management and a lack of audit control over the nearly $9 billion annual budget to outside contractors. Particular attention focused on the management of the strategic petroleum reserve. Mr. Bowsher elaborated on details of the GAO report and responded to questions. His testimony and other materials submitted for the record make up the hearing record. (DCK)

5298 **Third evaluation of the Federal Government's energy program dated November 4, 1981.** Lambsdorff, O. *VIK (Vereinigung Industrielle Kraftwirtschaft) Mitteilungen;* No. 6, 114-119(11 Dec 1981). (In German).

From VIK-assembly; Duesseldorf, Germany, F.R. (6 Nov 1981).

Dr. Otto Graf Lambsdorff, Federal Minister of Economics, by way of introduction states in his analysis of the third evaluation of the Federal Government's energy program that there will be no new energy policy but that the evaluation only intends to take into account the meanwhile changed basic conditions and emphasizes the continuity of our energy policy which is oriented towards market economy. Much attention is given to the remarks on the future extension of nuclear energy. The minister clearly points out the necessity of an increasing share of nuclear energy in the field of constant load. With reference to France, which with regard to cheap current gained a clear lead compared with our economy, the minister spoke out in favor of creating as soon as possible the same local conditions in the Federal Republic as in our neighboring country.

5299 **Energy political intentions of the Federal Government.** *VIK (Vereinigung Industrielle Kraftwirtschaft) Mitteilungen;* No. 6, 124-128(11 Dec 1981). (In German).

The leading motive of the third evaluation of the Federal Government's energy program is the energy supply as an economic and political challenge. From this point of view a further repression of mineral oil is of central importance. The VIK meets with approval that the Federal Government judges the results of savings in industry and in the private sector, so far achieved with means of the market economy, to be a confirmation of its energy policy, and as a result of this will continue to leave the fundamental control function to the market and will - as so far - only intervene in support in so far as it is necessary to accelerate and smooth the process of adaption. Tying energy policy into the economic order would ensure the flexibility which is an absolute must in view of the great uncertainties of a not foreseeable development.

5300 **Problems of land use and indemnification when installing power transmission lines.** Joachim, H. *Energiewirtschaftliche Tagesfragen;* **31**: No. 11-12, 873-879(Nov-Dec 1981). (In German).

The author states that the result of land, use proceedings is basically related to expropriation indemnities. The intersecting of

country which is more qualified, is more expensive. On the other hand, the extension of lines might be financially disadvantageous for public utilities.

5301 Energiepolitik fuer die 80er Jahre. Zur Dritten Fortschreibung des Energieprogramms der Bundesregierung. (Energy policy for the eighties). Koeln, Germany, F.R.; Verl. Industrie-Foerderung G.m.b.H. (Jun 1981). 107p.

This brochure comments upon the most important problems of future energy supply and on the change of the structure of energy consumption and supply in the F.R. of Germany. This is done with special regard to the rational and efficient utilization of energy as well as to the extension of nuclear energy in view of the third update of the energy programme of the Federal Government. The three appendices of the brochure deal with the following topics: 1. Specific energy consumption in the manufacturing trades, 2. Rational and economic energy utilization in industry, and 3. Comment on the report of the Enquete Commission 'Future Energy Policy' of the German Bundestag.

5302 Third update of the Federal Government's energy programme. Engelmann, U.; Klaete, G.; Liesen, K.; Bund, K.; von Ilsemann, W.; von Lersner, H.; Edwin, K.W. *Energiewirtschaftliche Tagesfragen;* **32**: No. 1, 5-14(Jan 1981). (In German).

Politicians and experts of the energy economy give their opinion on the guidelines being passed on 4 November 1981, which are of great importance for the energy policy of the eighties.

5303 Environmental regulation and the U.S. economy. Peskin, H.M.; Portney, P.R.; Kneese, A.V. (eds.). Baltimore, MD; Johns Hopkins Univ. Press (1981). 163p.

From review in Journal of Air Pollution Control Association; 32: No. 2(Feb 1982).

The relationship between governmental environmental regulations and the economy is examined in this book. The authors consider the available data and models describing the sources of economic difficulties as they are affected by environmental policies. They also discuss the effects of economic conditions on regulatory initiatives. Elements of regulatory policy which may have adverse effects on the economy are discussed and alternative approaches are suggested. One of the important elements is the conclusion that environmental policy and other social regulations are not the key elements to economic difficulties although their contribution must be recognized.

5304 Building an energy consensus: key issues for the eighties. Magida, A. Washington, DC; Northeast-Midwest Institute (1981). 58p. Northeast-Midwest Institute, Publications Office, P.O. Box 37209, Washington, DC 20013, $5.00.

Congress has been unable to develop a comprehensive national energy plan because conflicting political and technical questions prevent an agenda that will promote widespread support. This report summarizes a series of informal field hearings held to identify regional and ideological differences between the energy haves and have nots which culminated in a national conference in Washington, DC, June 4, 1981. A list of underlying concerns emerged that can form the basis of a working energy policy that will move the country forward without embracing a specific technology or favoring a particular region. The report also lists participants from Congress and the public. (DCK)

5305 Energy saving effects in dwellings where measures have been implemented by governmental energy saving grants. Anderlind, G.; Elmroth, A.; Lindoern, B.; Lundgren, T.; Norlen, U. Stockholm, Sweden; Svensk Byggtjaenst (Dec 1980). 184p. (BFR-D—7-1981).

This report presents the result from a comprehensive investigation of buildings in which energy conservation measures eligible for Government funding assistance have been undertaken. A total of 1144 buildings was inspected, of which 944 were detached houses, and 200 were apartment buildings. Data was collected for each of these buildings on the actual energy consumption before and after improvement. Consumption figures were corrected for temperature variations from year to year. Complete data was available for 841 buildings inspected, but it was not possible to obtain reliable energy data for the remaining 303 buildings. The result show that the energy conservation measures in question result in a significant savings effect on average. However, energy savings vary widely between individual houses in each group. In the report, the actual measured savings effects have been compared with the theoretical savings effects. In two groups the improvements have not resulted in as large savings as could be theoretically expected. These exceptions relate to the additional insulation of external walls in combination with attic insulation in detached houses, and to a detached house group in which replacement by, or upgrading to, triple-glazed windows was combined with additional insulation of external walls. The savings effects resulting from other structural conservation measures are good. When additional insulation of external walls or of the attic or replacement by, or upgrading to, triple-glazed windows have been carried out in isolation, both detached houses and apartment buildings have exhibited savings which agree quite well with theoretical savings. The combination of attic insulation and the fitting of thermostatic radiator valves, as investigated in detached houses, has resulted in excellent energy savings . The investigation also shows that the services-related measures have all resulted in good savings effects.

5306 Comments on the proposals of Lower Saxony for improving the cartel law in the sector of public utilities. Braun, D. *Energiewirtschaftliche Tagesfragen;* **29**: No. 3, 135-142(Mar 1979). (In German).

According to ideas of the regional Government in Lower Saxony a considerable competitive pressure on the public utilities shall be produced by limiting the demarcation facilities and by enabling economically reasonable transmission lines. In their proposals the cartel board of Lower Saxony and the Ministry of Economics accordingly partly neglect and misjudge the technically, physically and the economically conditioned facts of energy supply depending on transmission lines. The inevitable consequences of the proposal for the safety and efficiency of power transmission lines are not considered sufficiently.

2940 Fossil Fuels

REFER ALSO TO CITATION(S) 5050, 5058, 5060, 5093, 5197, 5232, 5251, 5256, 5263, 5266, 5270, 5277, 5291, 5388, 5398, 5398, 5425

5307 (AD-A—112505/3) Persian Gulf and the national interest. Professional paper. Wilson, D.P. (Center for Naval Analyses, Alexandria, VA (USA). Naval Studies Group). Feb 1982. 19p. (CNA-PP—339). NTIS, PC A02/MF A01.

With gasoline lines a fading memory, it is easy for Americans to misinterpret the energy crisis as overinflated, and even easier to underestimate the importance of the Persian Gulf. Yet, it was just two years ago that former President Carter designated the Persian Gulf as a region of vital national interest. His purpose, in what came to be known as the Carter Doctrine, was to help ensure the steady flow of petroleum to the world market. President Reagan has subsequently confirmed that policy by increasing the U.S. military presence in the Inidan Ocean, strengthening the Rapid Deployment Force (RDF), and selling AWACS and other advanced military equipment to Saudi Arabia. What seemed to be a sensible policy direction with the turmoil in Iran, skyrocketing oil prices, and the Soviet intervention in Afghanistan, has come under increasing criticism in the light of today's plentiful supplies of oil. A growing chorus of optimists argues that reliance on the unfettered market will give us a future of abundant energy and freedom from dependence on oil imports.

5308 (CONF-8110215—, pp 11-15) **Changing regulatory scene.** Means, R.C. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

In assessing impacts from the Natural Gas Policy Act (NGPA) of 1978, the author stresses the fundamental distinction between the partial regulation of natural gas before the Act and that which will exist after December 31, 1984. Before NGPA sales into the interstate market were regulated; sales within the intrastate

market were not. Under NGPA complete deregulation of more than half the supply of natural gas will coexist in the same market with continued price controls on the remaining supply. The author sees direct economic benefits of the low-priced regulated gas going to producers of deregulated gas through the competitive bedding process, rather than to consumers. Under complete deregulation his analysis shows the consumer fares the same with regional suppliers' profits more evenly distributed than under NGPA. (PSB)

5309 **(DOE/EIA—0239(81-82)) Underground natural gas storage in the United States, 1981-1982 heating year (April 1981-March 1982).** Koelling, G.W.; Kiedrowski, J.; Hinton, D. (USDOE Energy Information Administration, Washington, DC. Office of Oil and Gas). Aug 1982. 38p. NTIS, PC A03/MF A01. Order Number DE82021217.

This edition is the third in a series of annual reports on the Nation's underground natural gas storage. The report provides information on the operations, capacity, and location of underground natural gas storage facilities to a wide audience including industry, consumers, government agencies, and educational institutions. As of March 31, 1982, the end of the 1981 to 1982 heating year, the 402 active underground storage reservoirs in the United States contained 5355 billion cubic feet of natural gas (Table 1). Of this total, approximately 70.1% was base, or cushion, gas, and 29.9% was working gas. The volume of the latter is usually built up by injecting gas into storage when market requirements are below available gas flow in transmission lines during the nonheating portion (April 1 through October 31) of the heating year. Net injections during the nonheating portion of the 1981 to 1982 heating year of 1685 billion cubic feet were 15.3% of total dry gas production excluding nonhydrocarbon gases during the same period. Net withdrawals during the 1981 to 1982 heating season of 1618 billion cubic feet (Table 2) were equivalent to 16.5% of total estimated gas consumption during the same period. Working gas in storage at the end of the 1981 to 1982 heating year totaled 1601 billion cubic feet, approximately 1.8% below that available at the beginning of the heating year. This decline, despite an excess of storage injections over withdrawals (net injections) of 67 billion cubic feet during the heating year, was the result of book transfers from the working gas to base gas category. The volume of base gas in storage increased 2.7% to 3754 billion cubic feet. As of March 31, 1982, the 88 companies known to operate active underground storage facilities (see Appendix B) reported a total of 402 storage reservoirs with a combined capacity of 7829 billion cubic feet.

5310 **(EPRI-EA—2447-SY) World oil.** Sweeney, J.L. (Stanford Univ., CA (USA). Energy Modeling Forum). Jun 1982. 129p. NTIS, PC A07/MF A01. Order Number DE82906440.

Results obtained through the application of 10 prominent world oil or world energy models to 12 scenarios are reported. These scenarios were designed to bound the range of likely future world oil market outcomes. Conclusions relate to oil market trends, impacts of policies on oil prices, security of oil supplies, impacts of policies on oil security problems, use of the oil import premium in policymaking, the transition to oil substitutes, and the state of the art of world oil modeling.

5311 **(GAO/CED—81-145) Comments on Interior's surface mining regulations.** (General Accounting Office, Washington, DC (USA). Community and Economic Development Div.). 5 Aug 1981. 18p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906040.

A review was conducted of the Office of Surface Mining's (OSM) regulations for implementing the Surface Mining Control and Reclamation Act of 1977. The findings of the study as well as recommendations are presented. The objective was to determine if key regulations provided adequate environmental protection while allowing states and coal mine operators sufficient flexibility to choose the appropriate methods necessary to achieve the act's environmental goals at the least cost. The review consisted of interviewing officials of four State natural resource agencies (Colorado, Pennsylvania, West Virginia, and Wyoming), four coal associations, two coal companies, two environmental groups, one bonding association, the National Academy of Sciences, the Environmental Protection Agency, the Bureau of Mines, and OSM. During our review we also (1) analyzed technical data supporting surface mining regulations and responses to proposed regulations, (2) identified studies on cost/benefit analysis of environmental regulations and selected surface mining regulations, (3) reviewed the legislative history to determine the intent of the surface mining act, and (4) reviewed pertinent records, documents, and books at federal agencies. (DMC)

5312 **(GAO/EMD—81-119) Mining on National Park Service lands: what is at stake.** (General Accounting Office, Washington, DC (USA). Office of the Comptroller General). 24 Sep 1981. 59p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906037.

Report to the Chairman, Subcommittee on Mines and Mining, House Committee on Interior and Insular Affairs of the United States.

The Department of the Interior recommended to the Congress in 1979 that mining claims on certain National Park Service lands be acquired for environmental protection. GAO found that these recommendations were based on vague and misleading environmental and cost data and, if implemented, could result in costs substantially in excess of the reported estimates. GAO believes that the Congress should defer any action to acquire mining claims on these National Park Service lands. GAO recommends that the Department notify the Congress that it no longer supports these outstanding recommendations and submit more thorough analysis of the need and costs of acquiring these claims. GAO also found that Interior did not fully analyze the mineral supply implications of its recommendations. Specifically, Interior failed to assess adequately the effects of acquiring the mining claims on the US need for the minerals and the cost to replace them from other sources. The National Park Service now states that current mining regulations have ensured that mining on these park lands is occurring in an environmentally acceptable manner. However, NPS had not considered less costly means of achieving the same results. This is particularly true for Death Valley National Monument, an area historically and currently important for mineral production.

5313 **(GAO/EMD—82-23) Government support for synthetic pipeline gas uncertain and needs attention.** (General Accounting Office, Washington, DC (USA). Program Analysis Div.). 14 May 1982. 139p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906036.

Report to the Secretary of Energy.

GAO identifies DOE synthetic pipeline coal gas research and development which could be left to industry. Recent congressional budget cuts and further DOE proposals, if enacted, will eliminate much of the R and D. Also, the Department's environmental research has been cut back beyond what industry will be required to perform, and leaves a gap in needed efforts. Because DOE's support for large-scale demonstration projects has been eliminated, sponsors will likely have to look to the newly created Synthetic Fuels Corporation for Government financial assistance. GAO identifies obstacles facing commercial projects and makes recommendations for focusing the Department's research and development, providing necessary environmental research and furthering consideration of coal-gasification demonstrations.

5314 **(GAO/EMD—82-53) Pipeline purchases of high-cost natural gas: extent and contested issues.** (General Accounting Office, Washington, DC (USA). Energy and Minerals Div.). 6 Apr 1982. 27p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906032.

Report to Senator Howard M. Metzenbaum.

Natural gas produced under certain high-cost conditions is not subject to federal price regulation. However, pipeline companies still need federal approval to pass through such costs to their customers. Pipeline company purchases of such gas have been challenged before the Federal Energy Regulatory Commission by distribution companies, state and local governments, and others. This report discusses: the extent of purchases and the prices paid for such gas by 20 major pipelines; issues raised in challenges to such

purchases and company responses; and the status of major cases involving such purchases.

5315 **(GAO/GGD—82-48) Uncertainties about the definition and scope of the property concept may reduce windfall profit tax revenues.** (General Accounting Office, Washington, DC (USA). General Government Div.). 13 May 1982. 22p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906041.

Report to the Secretary of the Treasury.

The Crude Oil Windfall Profit Tax Act of 1980 contains a target revenue amount - $227 billion - to be collected over approximately a 10-year period. The basic determinant of the windfall profit tax rate is property, a concept which the act incorporates by reference to Department of Energy regulations. The property concept is singularly important because it controls the category or tier of crude oil which, in turn, establishes the applicable windfall profit tax rate, ranging from 30% to 70%. Notwithstanding its significance, there is considerable uncertainty over the property concept within both IRS and the oil industry. IRS has suspended certain examinations pending development of more definitive guidance. Similarly, some oil companies have raised questions about the reference year for making property determinations and about the scope of the property concept. Uncertainty over the meaning of a cornerstone term promotes neither voluntary compliance nor effective IRS examinations. Thus, Treasury and IRS need to quickly resolve uncertainties over the property concept.

5316 **(GAO/PLRD—81-49) DOE contracts to demonstrate coal liquefaction adequately protect government interests.** (General Accounting Office, Washington, DC (USA). Procurement, Logistics, and Readiness Div.). 17 Aug 1981. 23p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906042.

Report to the Chairman, Subcommittee on Interior and Related Agencies, Committee on Appropriations, House of Representatives.

Solvent Refined Coal I and Solvent Refined Coal II are processes for converting high ash and sulfur content coals to clean burning, environmentally acceptable solid and liquid fuels. The Department of Energy in 1980 awarded contracts to two companies to demonstrate these processes. The Chairman asked GAO to evaluate the negotiation and award of these contracts to determine whether they adequately consider and protect the Government's interest. GAO found that the contracts adequately protect the Government's interest and were awarded in accordance with established Federal and Department of Energy procurement policies and regulations.

5317 **(METC—82-25) Study of US coal resources, markets, and transportation.** (Zawadzki (Edward A.) Ltd., McMurray, PA (USA)). Dec 1981. Contract AC21-81MC16331. 72p. NTIS, PC A04/MF A01. Order Number DE82020908.

The purpose of this study is to review past work on the feasibility of attaining projections of coal production and use and to develop answers to the following questions: (1) are projected proven coal reserves adequate to sustain projected mine expansions and the continued high level of coal usage; (2) when and where will coal mining capacity be expanded to produce future coal supplies; (3) which markets will utilize the increasing coal production; and (4) will the transportation network be adequate to move this increased production to the consumer. Results indicate that: the United States coal reserve base is adequate to meet energy needs for the next 300 to 400 years at current production levels; coal production will double by the year 2000 due to significant growth in utility and industrial coal consumption; a significant part of the growth of electric utility coal consumption during the next 20 years will occur in regions of the country now utilizing relatively small quantities of coal; new coal production will be concentrated in the Western States; transportation is not a barrier to the development of an annual coal production double that of current production; until construction of new port coal loading facilities are completed, existing coal terminal loading facilities may have insufficient capacity to meet demand; and production of coal for the synthetic fuels industry is expected to be significant in the future. (DMC)

5318 **(MTP—80W00010) Summary of the second Western Hemisphere Energy Symposium, Rio de Janeiro, Brazil.** Pastor, M.M.; Cady, A.; Wagner, D. (comps.). (Mitre Corp., McLean, VA (USA). METREK Div.). 1981. 174p. (CONF-8009280—Summ.). Inter-American Development Bank, Publications-808 17th Street, NW, Washington, DC 20577. Order Number DE82906083.

From 2. western hemisphere energy symposium; Rio de Janeiro, Brazil (22 Sep 1980).

This energy symposium held sessions on: petroleum and natural gas; biomass; hydroelectric power; alternative energy sources; and the impact of the energy situation on the hemisphere's economy. Summaries of each session and abstracts of individual papers are included in this volume. (LCL)

5319 **(NASA-CR—168458) Energy environment study. Final report, 16 May 1980 - 15 Mar 1981.** Strangways, R. (Old Dominion Univ., Norfolk, VA (USA)). Dec 1981. 123p. NTIS, PC A06/MF A01.

The international demand for and supply of oil between the years 1980 and 2000 is assessed and future world oil prices and their implications for the price of jet fuel are estimated. Three critical questions are investigated: (1) how long will the world supply of oil continue to keep pace with its demand under likely trends in its use and discovery; (2) at what price will demand and supply clear the world oil market; (3) what does the analysis imply about the price of jet fuel. Projection of oil price is based upon supply and demand, which is consistent with microeconomic analysis.

5320 **(NP—2904016) Mitigating the impacts of coal/energy development in the western states. Final report, of the western coal planning assistance project.** (Missouri River Basin Commission, Omaha, NE (USA)). Mar 1981. 58p. NTIS, PC A04/MF A01. Order Number DE82904016.

Portions of document are illegible.

The Western Coal Planning Assistance Project's major goal was to help planners better understand the nature and impacts of coal development. All indicators point to success in this effort. User's evaluations of the Western Coal Planning Reference System show that there was a need for such a guide to coal-related facts and impact methodologies and that the system is being used. Participants evaluations of the training workshops provided further evidence of the project's positive impact. In summary, the following conclusions can be drawn: 1. Planners will continue to use the reference system, particularly if it is kept current. There will always be a demand for its basic, introductory information and references, since new planners are constantly coming into the area and more communities are being affected by energy development. 2. The success of the project was due not only to the quality of its products, but also to the intensive campaign that was waged to acquaint potential users with the reference system and stimulate their interest in further training. 3. Funds should be sought to continue updating and adding to the reference system and to continue to provide training opportunities for planners. More specific conclusions and recommendations are given.

5321 **(NP—2904425) 1981 California oil and gas production statistics and new-well operations: preliminary report. Publication No. PRO3.** (California Dept. of Conservation, Sacramento (USA). Div. of Oil and Gas). Jan 1982. 18p. NTIS, PC A02/MF A01. Order Number DE82904425.

Data on oil, gas, and water production in California are presented under the headings: state totals; state and federal offshore production; new well operations; production from oil fields-1981; federal offshore production-1981; and gas, condensate, and water production from gas fields and zones-1981. Data are presented in tabular form with productivity of each field reported. State oil production (386,000,000 bbls) increased by 29,000,000 bbl over 1980; natural gas production (397,000,000 Mcf) increased by nearly 80,000,000 Mcf over 1980; water production (2,410,000,000 bbl) increased by approximately 275,000,000 bbl over 1980. (DMC)

5322 (TVA/ONR/WR—82/9) Methodologies for assessing surface mining-impacts. Final TVA report. Betson, R.P.; Bales, J.; Deane, C.H. (Tennessee Valley Authority, Norris (USA). Office of Natural Resources). Dec 1981. 107p. NTIS, PC A06/MF A01. Order Number DE82905980.

The development, validation, and potential applications of a mathematical model developed by the Tennessee Valley Authority are described in this report. The model is particularly suited for the planning activities associated with the determination of the effects of land use change, particularly surface mining, on the water resource. The model was developed as a series of submodels which may be applied either separately or in concert, depending on the particular application. Components include TVA-HYSIM, a model for simulating changes to streamflow volumes and peaks, a suspended sediment model, and a water chemistry component. Validation tests of each of these components is presented. Procedures for applying these models to determine the probable hydrologic consequences of surface mining at a particular site are presented. Methodologies are also presented which can be used to assess the probable cumulative impacts of a number of surface mines in a particular basin.

5323 (USGS-OFR—81-317) Modeling the cumulative onshore effects of offshore oil and gas development. Smith, E.T.; Hecht, L.G. Jr. (Geological Survey, Reston, VA (USA). Office of Resource Planning Analysis). Jun 1981. 20p. Resource Planning Analysis Office, 750 National Center, Reston, VA 22092. Order Number DE82906097.

Portions of document are illegible.

Modelling Outer Continental Shelf (OCS) oil and gas developments and effects involves the use of a variety of planning and analysis techniques. This paper concerns onshore aspects of the OCS oil and gas development process; however, planning for onshore activities requires an understanding of the scale, magnitude, and timing of offshore activities that trigger onshore actions. A number of factors usually influence the numbers and kinds of onshore facilities that eventually locate in an area, given marketable discoveries of oil and gas. Generally, these include the discovered recoverable reserves of oil and gas in an offshore basin, the number and size of oil and gas fields discovered over time, production platform requirements, timing of field development and production operations, and the location and means of product transportation and processing. The sequence of events that occurs during the oil and gas leasing, exploration, development, and production process is the subject of this study. Following the introduction, the following topics are discussed: modelling requirements; magnitude and timing of offshore activity; onshore facilities and their impacts; regional analysis; state analysis; cumulative effects.

5324 San Jose Accord: energy aid or petroleum-marketing strategy. *Energy Detente;* 3: No. 13, 1-10(30 Sep 1982). (In English and Spanish).

The San Jose Accord was signed in San Jose, Costa Rica on August 3, 1980 by the Presidents of Venezuela and Mexico, whereby the two countries mutually committed to supply the net imported domestic oil consumption of several Central American and Caribbean countries. Countries initially participating in the program are: Barbados, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Jamaica, Nicaragua, and Panama. Seven eastern Caribbean countries were to meet on October 7 to petition for inclusion in the Accord, namely: Antigua, St. Kitt/Nevis, Montserrat, Dominica, St. Lucia, St. Vincent, and Grenada. The official language of the Accord is presented, and the operative status of the Accord two years after signing is discussed. Specific briefs about some of the individual countries in the Accord are included. The fuel price/tax series for the Western Hemisphere countries is updated.

5325 Mexico's gas dilemma may become solution. *Energy Detente;* 3: No. 12, 1-8(2 Sep 1982). (In English and Spanish).

Lack of port facilities, and adequate storage capacity, and weak international oil market conditions are serious obstacles to Mexico's ability to greatly increase petroleum exports. The new Administration will set Mexico's export levels, but for now PEMEX says 2.5-million barrels of crude per day to 1985 is the upper limit for exports. At that level, the most viable way to increase hydrocarbon export earnings is to increase natural gas exports. A chart shows the upward climb of gas production since 1938 and the almost vertical climb since 1979. Whereas two years ago the natural gas surplus was a dilemma for Mexico, today it could mean a solution. The question hinges on future Mexican policy opening the doors to the US gas market. This issue includes the update of the fuel price/tax series for the Eastern Hemisphere countries.

5326 Challenge of Venezuela's oil industry: deepening national participation. *Energy Detente;* 3: No. 11, 1-12(20 Aug 1982). (In English and Spanish).

As the world's barrel of oil becomes heavier, Venezuela and other heavy-oil producers face the special challenge of a sluggish but growing market for their abundant heavy crudes. Faced with an economy whose projected internal rate of growth is weak, Venezuela in mid-July raised crude production and moved larger volumes of heavier crudes, sold at non-OPEC-indexed prices. For the medium term, Petroleos de Venezuela, S.A. (PDVSA) has an investment program designed to bring onstream greater volumes of heavier crudes. The National Sixth Plan for 1981 to 1985 seeks to achieve this and other goals by increasing the participation of Venezuela-based companies national and foreign. This issue surveys the entire petroleum industry in Venezuela from the standpoints of production and policy and planning. This issue also updates the fuel price/tax series for the Western Hemisphere countries.

5327 Kuwait Petroleum Corporation: first annual report, 1980-1981. Sabah, A.K.A. (Kuwait Petroleum Corp., Kuwait). *OAPEC (Organization of Arab Petroleum Exporting Countries) News Bulletin;* 8: No. 8/9, 8-14(Aug-Sep 1982).

The Kuwait Petroleum Corporation (KPC) formed in 1980 as part of a reorganization, expansion, and modernization of the industry and its facilities. Kuwait has also increased its use of associated natural gas and the use of its national tanker fleet, as well as improving the production and marketing efficiency of its petrochemical industry. The KPC is responsible for continued progress in the production and marketing of petroleum products to ensure a strong industrial base for economic development. Each project must return at least a 20% profit. The report covers all aspects of the industry, from exploration efforts to marine transport and foreign investment, such as the recent acquisition of Santa Fe International. Studies of energy consumption by sector will lead to conservation steps as the economy expands. KPC manpower of 36.1% nationals and 83.6% Arabs receives ongoing training and career development. (DCK)

5328 US oil imports since the Arab embargo. *Energy Detente;* 3: No. 9, 1-6(9 Jul 1982). (In English and Spanish).

US petroleum imports have shrunk by 56.7% since 1977. This means a loss of sales of 4.9-million b/d of crude and refined products for the petroleum-exporting countries. However, suppliers have not lost sales equally. On the contrary, a graph shows how Saudi Arabia, Mexico, and Nigeria have taken shares from Canada and Venezuela and are now the principal suppliers to the United States. The United Kingdom has emerged in seventh position, after Venezuela. Various tables and graphs depict the import picture, broken down by such elements as the 5 Petroleum Administration for Defense Districts (PADs) and residuals imports. Also, the fuel price/tax series for the Western Hemisphere countries is updated in this issue.

5329 Recent US petroleum supply, consumption, and price data. Parent, J.D. *Energy Topics;* vp(5 Jul 1982).

Preliminary DOE petroleum data for 1981 indicate an average US production rate of 8.562 million barrels (bbl) per day (compared with 8.597 in 1980), a slight increase of 576 to 580 million barrels of natural gas liquids total production, and a slight decline in overall petroleum liquids from 3722 to 3705 million barrels. Wellhead prices rose from $21.19 to $31.77/bbl, while residential customers paid more per Btu for heating oil than for gas, but less than for electricity. Saudi Arabia and Nigeria have become the principal foreign suppliers; Canada and Venezuela were the largest

suppliers in 1972 to 1974. The US continues to lower its share of world oil consumption. Other statistics compare reserves, sectoral consumption, import levels and costs, and refining costs. 3 figures, 8 tables. (DCK)

5330 Coal-truck impacts on highway safety and traffic characteristics. Eck, R.W. (West Virginia Univ., Morgantown); Polus, A.; Halkias, J.A. *Transportation Quarterly;* **36**: No. 3, 469-484(Jul 1982).

A computer simulation model of accident rates and delay times is used to quantify highway hazards and congestion introduced by increases in large coal trucks. The effects of trucks on long grades, where the speed differences between trucks and other vehicles becomes greater, increases the potential for accident. Long lines of slow-moving trucks, however, reduce accidents because they reduce the opportunity for passing. At best, the trucks make traffic flow less stable. The results of this study can help in the design of passing lanes and improved grade alignment. 18 references. (DCK)

5331 Third special price report. *Energy Detente;* **3**: No. 7, 1-14(6 Jun 1982). (In English and Spanish).

Energy Detente's latest international price survey at midyear 1982 showed the average price of premium gasoline had fallen US $0.27 in the 11-month period since their first special report in July 1981. The biggest price drop occurred in Costa Rica, where prices in local currency increased slightly but in US dollars declined US $1.91 - due to the fall of the Colon against the US dollar. The case of Costa Rica exemplifies how the rise of the US dollar influenced the survey findings. Generally, the price drops showed that in several countries fuel prices haven't kept up with inflation and this shows up when prices are expressed in dollars. However, analysis of US prices, and prices in Guatemala where currency is at par with the dollar, shows prices fell (modestly) there too. Prices in Mexico and Venezuela doubled. Ecuador listed the lowest prices in the survey. Also included in this issue are brief energy notes from Mexico and other Latin American countries.

5332 Distributional implications of changes in US petroleum taxation. Catsambas, T. (International Monetary Fund, Washington, DC). *Journal of Policy Modeling;* **4**: No. 2, 211-222(Jun 1982).

This article develops a methodology based on input-output relations for the evaluation of excise-tax incidence. Since many excise taxes are levied on products that are used not only in final consumption but also as intermediate inputs in the production of other commodities, estimation of the tax burden by the conventional methodology of using direct final consumption may yield inadequate and perhaps misleading results. The input-output methodology developed in this article is applied to the case of the US taxation of petroleum products, and the empirical results are compared with similar ones obtained by the US Congressional Budget Office. 7 references, 1 figure, 3 tables.

5333 Saudi Arabia, OPEC, and the price of crude oil. Mixon, J.W. Jr. (Univ. of North Carolina, Greensboro). *Resources and Energy;* **4**: No. 2, 195-201(Jun 1982).

In his recent The Myth of the OPEC Cartel (Wiley, New York) Ali D. Johany argues forcefully that OPEC is not a cartel, and that higher oil prices derive from changes in property rights. This paper examines the incentives facing Saudi Arabia, as compared to those facing OPEC as a whole, to restrict production. The author concludes that, acting in its own self-interest, Saudi Arabia would adopt a posture of pricing moderation. 2 references, 2 figures, 1 table.

5334 Reducing US vulnerability to world oil-supply disruptions. Brown, S.P.A. (Federal Reserve Bank, Dallas, TX). *Economic Review;* 1-13(May 1982).

A free-market approach to reduce the economic costs of importing oil can lower the production losses and high prices following a supply disruption by encouraging the private sector to prepare stockpiles, arrange long-term purchase contracts with domestic producers, and invest in conservation. The benefits will outweigh a short-term price increase caused by deregulation. Interventionist policies that include tariffs, use taxes, or subsidies could cause negative responses from consumers and other international markets, while tax credits distort costs and regulations have compliance costs. None of these approaches has the efficiency of the free market for reducing consumption and increasing domestic production. Policy, however, tends to reflect a political distaste for higher production profits. 9 references, 5 figures, 4 tables. (DCK)

5335 Petrochemicals: changing markets and limits to growth alter outlook. McClelland, E.L. (Republic of Texas Corp., Dallas). *Economic Review;* 14-20(May 1982).

The basic petrochemical industry has grown eight-fold since 1947, twice the growth of all manufactures, but the current recession has closed down a quarter of production capacity and lowered the output of the remainder. The US has a world advantage in petrochemicals because the industry grew along with the expanding automobile industry. However, petrochemical markets have become more cyclical as supplies of feedstocks became less abundant, production costs rose, and demand became tied to the container, construction, housing, and automobile markets. Foreign competition is growing as producing countries build their own petrochemical industries, but rapid expansion in Canada and Mexico offer the greatest potential competition. The development of new products with higher value will enable the industry to meet this competition. 2 figures, 2 tables. (DCK)

5336 Geopolitics of heavy crudes and bitumens. *Energy Detente;* **3**: No. 3, 1-10(12 Mar 1982). (In English and Spanish).

The geography of heavy crudes and bitumens is even more elitist than it is for conventional petroleum: three countries - Canada, Venezuela, and the USSR - hold 88% of those resources as recoverable economically and technologically. Thus, these countries also hold a medium-term alternative to conventional petroleum concentrated mainly in the Middle East. Production, too, is dominated by only a few nations, with Venezuela, the US, Mexico, China, and Canada producing about 70% of world supplies of petroleum under 20°API. At the Second International Conference on Heavy Crudes and Tar Sands held in Caracas, Venezuela in February 1982, Energy Detente established that 671.7 billion barrels of nonconventional (under 20°API) hydrocarbons are recoverable with proven technology - and their exploitation is economically superior to that of conventional crudes using tertiary recovery methods. The Definitions Committee of the above conference set definitions for heavy crudes, extra heavy crudes, and bitumens, which are given here. This issue updates the geography of heavyweight oil and addresses the geopolitical implications. The hydrocarbon price series for the Western Hemisphere is updated.

5337 Mexico: energy point man. *Energy Detente;* **3**: No. 2, 1-8(2 Feb 1982). (In English and Spanish).

This issue examines retail petroleum-product prices in the Western Hemisphere and presents tabular data, but the focus is on Mexico. During the period July 1981 to January 1982, the Lopez Portillo government in Mexico doubled the prices of Nova (regular leaded) gasoline and diesel fuel, and raised (premium unleaded) gasoline prices 43%. A few other countries increased prices moderately. The Mexican government justified the drastic increases, using the following rationale: (1) Mexico wastes a lot of energy, its use per unit of Gross Domestic Product more than double that of the industrialized countries; (2) during recent years gasoline consumption has run amuck, increasing 15% annually; and (3) the fuel price increases would not greatly impact the buying power of the Mexican people. The government explained that subsidizing fuel consumption cost PEMEX $12.5 billion during 1981. What hurt worst was the fact that selling a barrel of refined products within the country brings only 1/4 the money that a barrel of exported crude brings. Very little of the subsidy trickles down to lower classes, and 85% of the vehicular fuel is burned by 20% of the population. It is concluded that cheap energy is still risky business, even for major petroleum-exporting countries; further, Mexico may prove to be the point man, in the international movement to reduce domestic fuel subsidies. The petroleum product price/tax report and the hydrocarbon price series are updated for the Western Hemisphere countries.

5338 **Renewables spending.** *Energy Report (Alton, England);* 9: No. 3, 6(Feb 1982).

Sweden's long-term strategy on renewable energy sources provides for expenditure of $255 million over the next three years with a further $300 million to be spent promoting introduction of forest energy and peat. The aim is that peat and logging residue should replace three million tons of oil within ten years and that solar energy should supply 15TWh by 2000.

5339 **Survey of United States and total world production, proved reserves, and remaining recoverable resources of fossil fuels and uranium as of December 31, 1980.** Parent, J.D. Chicago, IL; Institute of Gas Technology (1982). 194p. Institute of Gas Technology, Chicago, IL 60616 $10.00.

Estimates as of year-end 1980 are provided for proved reserves, resources, current production, cumulative production, and life index of the nonrenewable energy sources of the United States and of the world as a whole. World regional data are also provided where possible. Reserve and resource data are given in conventional US units - cubic feet, short tons, and barrels; and in common energy units - Btu, metric tons of coal equivalent, and joules. The text contains 78 tables, three of which summarize current estimates of the US and world reserves and resources; these tables are accompanied by many explanatory notes. The excellent position of the US with respect to coal is clearly evident in these tables. Two tables present life indexes of US and world fossil-fuel reserves and resources for growth rates of 1 to 4%. Also of considerable interest are two tables that show current annual production and cumulative production of fossil fuels and uranium oxide for the US and the world as a whole. These tables show that the US has been and continues to be a leading producer of natural gas, natural gas liquids, coal, oil and uranium, although it does not produce nearly as much coal as might be expected in view of the abundance of this resource. One table shows the vast differences in average oil-well productivity that exist regionally - a factor of great economic importance and a great advantage to the Middle East. The new wells of Prudhoe Bay (Alaska) and Mexico (Reforma and Gulf of Campeche) are also of very high productivity. The US average is very low because of the large number of stripper wells - whose output is very low individually, but collectively contribute appreciably to the total US oil production.

5340 **Mobil-Marathon and similar oil company mergers. Hearing before the Subcommittee on Fossil and Synthetic Fuels of the Committee on Energy and Commerce, House of Representatives, Ninety-Seventh Congress, First Session on H.R. 4930.** Washington, DC; Government Printing Office (1982). 84p.

Subcommittee chairman Phillip R. Sharp's opening statement notes that a wave of large horizontal and vertical mergers are the result of rising oil prices and oil-reserve values, price decontrol, and a relaxation of anti-merger enforcement by the Reagan administration. US merger activity in 1981 had a $20 billion value, half of which involved oil, gas, mining, and mineral companies. Chairman Sharp further notes that the mergers will raise customer costs and eliminate many small companies, which indirectly retards new exploration. H.R. 4930 requires a study of these effects and provides for a moratorium on larger mergers until the study is completed. The testimony of eight witnesses representing oil companies and related groups follows the text of H.R. 4930. Additional material submitted for the record includes a resolution by the Illinois Petroleum Marketers Association expressing their concern about the impact of mergers. (DCK)

5341 **Production potential of federal coal leases. Oversight Hearing before the Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs, House of Representatives, Ninety-Seventh Congress, Second Session on production potential of federal coal leases.** Washington, DC; Government Printing Office (1982). 52p.

Dr. Audrey Buyrn, Program Manager of the Materials Program, US Office of Technology Assessment (OTA), described the results of an OTA review of federal coal leases and an analysis of mining activities on federal lands in 14 states. Her report focuses on the six western states accounting for 99% of production on federal lands. The OTA found good-quality coal and no evidence that existing leases are too small or remote or too constrained by environmental problems for development. Over 15.8 billion tons of the 16.3 billion tons of recoverable reserve under lease in the six states could be developed if market conditions are favorable and other uncertainties resolved. Additional material submitted from OTA follows Dr. Buyrn's testimony. (DCK)

5342 **Coal severance-tax limitations. Hearings before the Subcommittee on Fossil and Synthetic Fuels of the Committee on Energy and Commerce, House of Representatives, Ninety-Seventh Congress on H.R. 1313, October 28, 1981 and March 29, 1982.** Washington, DC; Government Printing Office (1982). 260p.

Hearings on H.R. 1313 examined the impact of coal severance taxes on national policies aimed at increasing the production and use of coal. High energy prices impose a burden on interregional commerce because severance taxes now represent major transfers of wealth. H.R. 1313 proposes a limit of 12.5% of the value of the coal, which mineral-rich states feel is inadequate to cover the environmental and socio-economic burdens of energy development. The text of H.R. 1313 is followed by the testimony of 19 witnesses representing the affected states and utilities and by additional material submitted for the record. (DCK)

5343 **Office of Surface Mining reclamation and enforcement budget request for Fiscal Year 1983. Oversight Hearing before the Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs, House of Representatives, Ninety-Seventh Congress, Second Session.** Washington, DC; Government Printing Office (1982). 217p.

James R. Harris, Director of the Office of Surface Mining Reclamation and Enforcement, and a panel of three environmentalists testified on the 1983 budget request for the Office of Surface Mining (OSM). At issue were the continuing number of industry and citizen lawsuits, reorganization to reduce Federal involvement, plans to phase out the rural abandoned-mine program, and whether the budget is adequate to perform the necessary tasks. Harris defended the budget and the plans to turn regulatory functions over to the states. The panel noted the reluctance of some states to interfere with mining operations and the budget's inadequacy to deal with regulatory responsibilities. (DCK)

5344 **Alaska natural gas transportation system (Part 1). Joint Hearings before the Subcommittee on Fossil and Synthetic Fuels of the Committee on Energy and Commerce and the Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs, House of Representatives, Ninety-Seventh Congress, First Session on H.J. Res. 341, October 21, 22, 23 and 27, 1981.** Washington, DC; Government Printing Office (1982). 891p.

Part 1 covers four days of hearings on House Joint Resolution 341, which waives the Alaska Natural Gas Transportation Act of 1976 to allow the project to proceed. The waiver will enable pipeline sponsors to procure debt financing on the international lending market to make up an $18 billion shortfall in funding. Sponsors of the $35 billion project want a prebilling waiver to shift some of the risk to gas consumers, which will ensure that consumers pay the full cost. The waiver also allows producers to buy equity in the pipeline. The testimony of 32 witnesses from the oil, pipeline, and banking industries and additional material submitted for the record examines the fairness and economics of these proposals. (DCK)

5345 **Alaska natural gas transportation system (Part 2). Joint Hearings before the Subcommittee on Fossil and Synthetic Fuels of the Committee on Energy and Commerce and the Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs, House of Representatives, Ninety-Seventh Congress, First Session on H.J. Res. 341, October 30, November 4, and 9, 1981.** Washington, DC; Government Printing Office (1982). 955p.

Part 2 of the hearing record continues testimony on the proposed Alaska Natural Gas Pipeline waivers to facilitate financing for the largest construction project ever attempted by the private sector. The administration's waiver proposal is supported by

and other interest groups, and the economy. Additional materials and letters from organizations follow the testimony. (DCK)

5346 **Report of the Commission on Fiscal Accountability of the Nation's Energy Resources.** Washington, DC; Government Printing Office (1982). 359p. GPO.

The Commission, chartered July 8, 1981, investigated alleged irregularities in royalty payments owed to the Federal government, Indian tribes, and states and the alleged theft of oil from these lands; it concluded that the Federal government has failed to properly manage its energy resources for more than 20 years, so the oil and gas industries are not paying all royalties that they owe. Poor accounting and inadequate records resulted in underpayments, while poor security at lease sites invited theft. With the high cost of energy, the US can no longer continue to tolerate poor management. Major recommendations as a result of this study are for the government to require qualified managers, participate in closer interaction with states and Indian tribes, and perform an oversight role. The oil and gas industry, in turn, should meet its royalty obligations. The report lists specific actions for each of its recommendations, dealing with internal controls, site security, enforcement, states and tribes, organization, and royalty management. 1 table. (DCK)

5347 **Environmental planning guidelines for offshore oil and gas development.** Gilbert, J.T.E. (ed.). Honolulu, HI; University Press of Hawaii (1982). 64p. East-West Environment and Policy Inst., East-West Center, 1777 East-West Rd., Honolulu, HI 96848.

The general guidelines in this volume provide policymakers and concerned citizens with a broad overview of the environmental aspects requiring attention in the planning for offshore exploration, development drilling, and production. This includes planning for both onshore supply, storage, construction, terminal and housing facilities and offshore transport, development and storage facilities. They also provide a practical approach for incorporating and planning to meet these concerns in the early stages of project development. Drawing heavily on the input and discussions of two workshops, this volume is also an initial step in communicating some of the results of the Environment and Policy Institute (EAPI) work. 15 references.

5348 **Structural differences and macroeconomic adjustment to oil-price increases in a three-country model.** Marion, N.P.; Svensson, L.E.O. Cambridge, MA; National Bureau of Economic Research, Inc. (1982). 53p. National Bureau of Economic Research, 1050 Massachusetts Ave., Cambridge, MA 02138, $1.50.

A three-country model based on intertemporal maximizing behavior is constructed in order to analyze the effects of oil price increases on welfare levels and trade-balance positions. The model can also be used to assess the effects of oil price increases on the world interest rate, on the final-goods terms of trade between oil importers (what is sometimes called the real exchange rate), and on output, investment and savings levels, oil imports, wages, and consumption at each date. The analysis highlights the role of structural asymmetries between oil importers in accounting for differences in trade-balance responses. A number of structural differences are isolated in turn in order to determine their influence on the final-goods terms of trade, which is the key factor in affecting relative trade-balance positions. 20 references.

5349 **Enhanced oil recovery.** *Quarterly Energy Review - North America;* 1-7(1982).

Enhanced recovery should raise oil well recovery from the present one-third level to 45% in old wells and 55% in new wells. The potential from 466 non-communist projects, half of which are US, is estimated at 880,000 to 945,000 barrels/day worldwide. Various technologies are available: steam-soak and in-situ-combustion thermal processes; carbon dioxide, hydrocarbon, and nitrogen-flooding miscible processes; and surfactant, polymer-flooding, and alkaline-flooding chemical processes. A new oil-field-support industry is emerging in conjunction with these processes, but the drop in ments. At present, they also have the embarrassment of setting a poor example for consumers by leaving more oil in the ground than they remove. 1 figure. (DCK)

5350 **Prospects for petroluem coke.** *Quarterly Energy Review - North America;* 14-19(1982).

Delayed and fluid coking of residual fuels is a process that could have a market impact for US refiners, who have over 15.4 million tons or 85% of the free-world coking capacity. Expansion plans by US refiners will add another 2.7 million tons/year. Variations in feedstocks and processes can produce sponge cokes, honeycomb coke, needle coke, or fluid coke. Major users of delayed petroleum coke are the aluminum, iron, and steel industries. Large boilers and cement plants can burn a mixture of raw petroleum coke and pulverized coal. A comparison of world production, imports, exports, and consumption shows the potential for a growing market. 4 tables. (DCK)

5351 **Annual committee reports on significant legislative, judicial, and administrative developments in 1981: Oil Committee state reports .** *Natural Resources Lawyer;* **15**: No. 1, 201-273(1982).

The major legislative, judicial, and administrative developments occurring at the state level in 24 states during 1981 are grouped alphabetically by state. Only Indiana and Kentucky of the states covered failed to pass new legislation, while Kansas, Kentucky, Nebraska, and Utah had no pertinent lawsuits. Six states took no new administrative action. (DCK)

5352 **Oil markets in turmoil: an economic analysis.** Verleger, P.K. Jr. Cambridge, MA; Ballinger Publishing Company (1982). 320p. Ballinger Publishing Company, 54 Church Street, Cambridge, MA 02138.

Departing from conventional wisdom about the forces most responsible for oil price increases, this book analyzes the response of consumers, oil companies, and oil-exporting nations to show that lethargy, not greed, best describes the behavior of these participants during a supply disruption. The adjustment to changes in market conditions is so slow that minor incidents are transformed into major crises. Assessing existing policy options, Verleger dispels the idea of matching supply losses with an equal cut in consumption. He recommends a free-market approach, which entails raising prices quickly, imposing large tariffs on imports, encouraging the development of private stockpiles, and using spot prices as an indicator of oil shortages. He shows that the market approach will impose fewer costs than the regulatory approach in the long run. 83 references, 17 figures, 70 tables.

5353 **3rd amendment of the energy programme.** *Glueckauf;* **117**: No. 24, 1629-1631(17 Dec 1981). (In German).

On November 4, 1981, the Federal Government has passed the 3rd amendment of its energy programme. So far, the following energy programmes have been presented which give an outline of energy perspectives, goals, and energy policy measures of the Federal Government: The first programme was presented in September 1973, shortly before the 1973/74 oil crisis. The changes in the world energy markets resulting from this oil crisis led to the 1st amendment of October 1974. In spring 1977, the Federal Government announced a second amendment which was published in December 1977. The article presents a summary of the third amendment by the Federal Minister of Economics and those parts of the third amendment which deal with coal and coal beneficiation.

5354 **Trends on the world oil market after the Geneva OPEC conference of October 29, 1981.** Rummert, H.J. *Glueckauf;* **117**: No. 24, 1632-1635(17 Dec 1981). (In German).

After a short review of the period of the OPEC split price system between 1979 and October 1981, the decisions made of the OPEC conference of October 29, 1981 are discussed. The new petroleum extraction policy of Saudi Arabia is reviewed, and price

trends in non-OPEC countries after the Geneva conference are discussed. Finally, effects on West German economy are investigated.

5355 **World energy markets between short-term weakness and long-term structural change.** Mohnfeld, J. *Glueckauf;* **117**: No. 22, 1497-1503, 634-639(19 Nov 1981). (In German and English).

In its most recent annual review of 'Energy Policies and Programmes of IEA Countries', the International Energy Agency (IEA) attempts to lay down guidelines for the orderly development of the energy supplies of the industrialized nations in the course of the next 10 years. The most significant results of this energy policy analysis are described and discussed in this article; in addition a scenario up to the year 2000 is given, on the basis of a provisional long-term analysis by the IEA Secretariat. However, in order to provide some energy policy background, we start with an examination of the current situation on the world's oil markets.

5356 **Coal stockpile: how much is enough. How much is too much.** Mills, M.T. (Holston Defense Corp., Kingsport, TN). *American Institute of Industrial Engineers, Detroit Chapter, Proceedings of the Annual Conference;* 362-373(1981). (CONF-810538—). Detroit, MI, USA (17 May 1981).

Companies that stockpile coal often maintain a 60 to 90 days' supply during periods of relatively stable supply and 100 to 120 days' supply during periods of anticipated strikes by miners/railroad workers. This paper describes a procedure that can be used to (1) estimate the probabilities and durations of strikes, (2) calculate the cost of stockpiled coal, (3) calculate the cost of incurring the effects of a coal shortage, and (4) determine which will provide adequate supplies of coal more economically: a stockpile or contingency plans. The Delphi Method is used periodically to poll experts on the company's coal vendors and coal carriers and derive either consensus figures or a pessimistic-optimistic range of figures which translate into probability distributions of strike durations and cost of contingency plans. After the probability distributions have been prepared, the service level percentile to be achieved by the stockpile is used to predict the strike duration associated with that percentile and the cost of contingency plans associated with that percentile. It is then possible to calculate whether it would be cheaper to (1) stockpile enough coal to provide for the company's needs at the desired service level (2) implement the contingency plans when (and if) the need arises. The paper provides an easy-to-follow example and examines practical considerations of the Delphi questionnaire, probability distributions, and stockpile adjustments.

5357 **Study of transhipment as part of retail coal delivery.** Ward, R.E. (West Virginia Univ., Morgantown, WV); Gochenour, D.L. Jr. (West Virginia Univ., Morgantown, WV); Kuo, D.D. *American Institute of Industrial Engineers, Detroit Chapter, Proceedings of the Annual Conference;* 545-548(1981). (CONF-810538—). Detroit, MI, USA (17 May 1981).

A report is made of the application of the classic transportation model to the problem of evaluating alternate geographical locations for retail coal yards within West Virginia. The coal yards would serve as transhipment points between the mine mouth and the eventual consumer, in this case West Virginia public buildings. Briefly discussed is the establishment of market zones and the formulation of the transhipment point model. Discussed in greater depth is the data assembly, including forecasts of zonal monthly coal demand and the development of the transportation network, incorporating rail, barge, and truck. Also presented are the results of four case studies. The cases differ based on the assumed mode or combination of modes used to deliver coal to the transhipment points. Truck is always the assumed mode for delivery to the public buildings. The results presented include the recommended location of transhipment points, their estimated peak monthly inventory in terms of tons of coal storage area required, and comparison of transportation costs between the four case studies. The conclusions cite assumptions made and the limitation of both the methodology and the suggested use of coal yard transhipment points.

5358 **Natural-gas supplies and prospects in the Community.** Luxembourg; Commission of the European Communities (1981). 112p. Commission of the European Communities, Office for Official Publications, Brussels, Luxembourg.

Natural-gas supplies expanded rapidly over a 20-year period due to deposits in the Netherlands and the North Sea, but production is expected to level off and decline by the end of the 1980s. Although world reserves are adequate to meet demand growth until the next century, additional Community demand will be met by an increasing share of imports from non-Community countries, reaching 50% by 1990. The Community currently receives imports from Norway, the Soviet Union, Algeria, and Libya. Transport and price uncertainties make it desirable for the Community to intensify the development of synthetic natural gas (SNG) from coal and liquefied petroleum gas (LPG). Economic conditions have caused a shift from industrial to household uses, but the high rate of baseload power-plant use continues to be unsatisfactory. 16 figures, 17 tables. (DCK)

5359 **Towards an international price for natural gas.** *Quarterly Energy Review - North America;* 13-22(1981).

The breakdown in price negotiations between British Gas and Sonatrach over liquefied natural gas (LNG) and between the Soviet Union and customers of the Yamal pipeline from Siberia indicates the level of current controversy due to the lack of an international price for gas. No cartel has formed for natural gas, which lacks the homogeneous market of oil, is more costly to transport, and has traditionally lagged behind oil in price. Gas prices in the US remain low and nonuniform compared to world prices because of price regulations. The Yamal pipeline is the largest uncertainty because of US opposition, but the major long-term issue is finding an international price for gas that will encourage OPEC countries, which contain 28% of known reserves to enter the market. The cost of coal gasification will be the ultimate constraint on gas prices. (DCK)

5360 **Use of political pressure as a policy tool during the 1979 oil-supply crisis.** Erfle, S.; Pound, J.; Kalt, J. Cambridge, MA; Harvard University (1981). 179p. Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, 79 Boylston St., Cambridge, MA 02138.

The response of American markets to supply crisis in world oil markets is analyzed in the context of four main issues: the efficiency of the operation of American oil markets during oil-supply crises; the problems of both economic efficiency and social equity that arise during the American adaptation process; the propriety of the federal government's past policy responses to these problems; and the relationship between perceptions of the problems caused by world oil crises and the real economic nature of these problems. The conclusion is reached that federal intervention has caused the bulk of the genuine oil-market inefficiencies experienced by American consumers since 1973, and has forced major oil companies in particular into price and supply behavior at odds with the interests of the firms themselves and society's interests in maximizing national economic output. 64 references, 15 figures, 11 tables.

5361 **Regulating drilling effluents on Georges Bank and the Mid-Atlantic Outer Continental Shelf: a scientific and legal analysis. A report submitted to the states of Maine, New Hampshire, Massachusetts, and New Jersey.** Spiller, J.; Rieser, A. Orono, ME; Maine Law Institute (1981). 159p. State Planning Office, 184 State Street, Augusta, ME 04333.

A study of compliance monitoring of offshore-drilling effluents was prepared for the affected states to help them evaluate proposed drilling operations on Georges Bank and future drilling in the Mid-Atlantic. The report consists of a summary of the literature on the fate and effects of drilling-mud discharges, a history of the permits that have been issued for exploratory drilling in Outer Continental Shelf (OCS) regions, and a discussion of issues concerning the monitoring of permit compliance. 169 references, 16 figures, 7 tables.

5362 Capital investments of the world petroleum industry, 1980. Keenan, P.J.; Dobias, R.S.; Anderson, N.J. New York, NY; Chase Manhattan Bank (1980). 20p. Chase Manhattan Bank, Energy Economics Division, One Chase Manhattan Plaza, New York, NY 10081.

The non-Communist petroleum industry increased its capital and exploration expenditures 30% in 1980 for a record $113.2 billion due to price decontrol in the US and national security and balance-of-payments concerns in the rest of the world. A breakdown of these expenditures by geographic area and function shows that the US spend $42.9 billion of the capital. Production accounted for $66.9 billion of world expenditures, with the US spending $33.1 billion on production. Five comparison tables appear in the appendix. 5 figures. (DCK)

5363 Underground coal gasification: a preliminary evaluation. Golden, CO; Colorado Energy Research Institute (1980). 43p. Colorado Energy Research Institute, 2221 East St., Golden, CO 80401.

Underground Coal Gasification (UCG) offers the promise of being more economically attractive, safer, less socially and less environmentally disruptive than other forms of coal-based synthetic fuel development. These advantages may outweigh some process uncertainties which - similar to most mining processes - are largely specific to the site under development and must be addressed on a site specific basis. Recent announcements by ARCO and Gulf indicate that serious development is underway with significant financial commitments to be made. DOE also projects a joint pilot plant program with industry in 1981. UCG appears to have strong development potential in Colorado because of the State's great coal resource base (fourth largest in the US, more than 90% recoverable by underground mining) and because Gulf's initial site choice for its steeply-dipping-bed test program was in Weld County. A continuing effort to define specific site characteristics will be required within the state in areas showing potential for UCG development.

5364 Reducing tanker accidents. New York, NY; Exxon Corporation (1973). 19p. Public Affairs Dept., Exxon Corp., 1251 Ave. of the Americas, New York, NY 10020.

In analyzing the nature and causes of tanker accidents and the resulting pollution, this paper concentrates on the most-promising and most-feasible measures for reducing the chance of accidents, particularly the groundings and collisions which account for the major portion of accidental pollution. Note is also made of the improved construction techniques in newer vessels, the advanced operational and survey procedures for all vessels, and their potential to reduce loss from structural failures. A critical component in reducing accidents is increased and improved training, sound operational measures, and the use of traffic-control systems and navigational aids. The presence of appropriate and adequate terminal facilities for tankers is important, as is the need for more deep-water terminals to accommodate the growing fleet of large tankers. The maritime community should urge international safety standards and procedures to ensure the safe, economical, and environmentally sound transport of oil. 9 figures.

2950 Hydrogen And Synthetic Fuels

REFER ALSO TO CITATION(S) 5441

5365 (DOE/CE—034) Summary of DOE Hydrogen Program FY-1981 by the Hydrogen Energy Coordinating Committee. (USDOE Assistant Secretary for Conservation and Renewable Energy, Washington, DC. Office of Vehicle and Engine Research and Development). Jul 1982. 52p. NTIS, PC A04/MF A01. Order Number DE82020494.

The FY 1981 Summary is the fourth consecutive yearly report on all hydrogen-related programs within DOE. The report provides an annual overview of the hydrogen-related programs of the DOE offices represented in the Hydrogen Energy Coordinating Committee. A historical summary of hydrogen budgets of these offices is given. The distribution by program element for FY 1981 is given. The DOE hydrogen total for research funding in FY 1981 was $30.9 million. The Nuclear Power System budget numbers are the portion of the high-temperature gas reactor programs with potential application to hydrogen production. These figures are omitted from the totals because the work is only indirectly related to hydrogen. Present DOE hydrogen research focuses on its use as an energy storage medium and as a general purpose fuel. The individual program elements of the DOE hydrogen programs are described in the body of this report. More specific program information is given in the Technology Summary Forms in Appendix A. In some cases, these forms show funding levels beyond FY 1981. These figures reflect program planning estimates and should not be considered as final budgets. A report issued by the US General Accounting Office, entitled The Potential for Hydrogen as an Energy Source, discusses the present status and future prospects of the utilization of hydrogen as a fuel and is included in Appendix B.

5366 (DOE/CS/56051—7) Status of alcohol-fuels-utilization technology for highway transportation: a 1981 perspective. Volume I. Spark-ignition engines. (Mueller Associates, Inc., Baltimore, MD (USA)). May 1982. Contract AC05-79CS56051. 99p. NTIS, PC A05/MF A01. Order Number DE82020493.

The current status of the technology(ies) of alcohol utilization in highway transportation is reviewed. The use of methanol, ethanol, and certain of their derivatives in vehicles powered by spark-ignition engines is treated in this volume. Alcohol utilization in diesel-powered vehicles is covered in Volume II. The results of engine, vehicle, and fuels testing are summarized. The topics of exhaust emissions, performance and fuel economy, vehicle driveability, fuel systems materials compatibility, engine and vehicle design, fuels characterization, and environmental considerations are discussed, based upon the most recent data available at this time. The status of the technology at the time of the last comprehensive survey (1978) is summarized and discussed. Significant advances made since that time are delineated, as are remaining information gaps and areas in which more extensive investigation is still needed. An appendix to this Volume (I) describes important properties of selected alcohols and alcohol-derived fuels.

5367 (DOE/RA/50393—1241) Plant to produce 20,000 barrels per day of gasoline from coal. Executive summary. (Hampshire Energy, Milwaukee, WI (USA)). 1982. Contract FG01-81RA50393. 12p. NTIS, PC A02/MF A01. Order Number DE82022000.

This Executive Summary presents results of Hampshire Energy's evaluation of the technical and economic feasibility of a plant to produce approximately 21,000 barrels per day of gasoline from coal. Located near Gillette, Wyoming, the plant would produce this gasoline and other marketable by-products by indirect liquefaction of 15,450 tons of Powder River Basin sub-bituminous coal. The results of the evaluation are summarized: resource assessment has confirmed the availability of the necessary coal, water, electricity and natural gas supply; a suitable plant site is available; applications have been fired for all major permits required to construct and operate the plant; only commercially proven or commercially ready technologies have been included in the plant; process licenses are available for all units requiring licensing; the Hampshire configuration of process units is technically sound regarding operability, availability, controllability and maintainability; detailed process design and preliminary basic engineering designs have been developed from which the plant's investment and operating costs have been estimated; a project execution plan and schedule for engineering, procurement and construction have been developed; plant costs have been estimated as $1790 million in 4th Quarter 1981 dollars; commercial feasibility depends on support by the US Synthetic Fuels Corporation in the form of loan and price guarantees.

5368 Chemical producers look beyond petroleum. DeYoung, H. *High Technology;* 2: No. 5, 57-63(Sep-Oct 1982).

Mindful of the 1973-1974 oil embargo, the chemical industry is modifying syntheses from coal gasification and developing new processes from biomass conversion and recombinant DNA. Coal enjoys abundant supply, lower anticipated prices, and political advantages as a source of petrochemicals. US industries are looking with new interest at the German Fischer-Tropsch, South African

SASOL, Tennessee Eastman, and other processes. Transport and byproduct disposal are major problems associated with coal as a raw material. Synthetics from natural gas, ethanol from biomass, and other alternative feedstock processes continue in the research stage. 7 figures. (DCK)

5369 **Methanol: future fuel for electric utilities.** Haggin, J. (Chemical and Engineering News, Chicago, IL). *Chemical and Engineering News;* 41-42(19 Jul 1982).

The chemical derivation of methanol from synthesis gas is emerging as a way for electric utilities to continue using existing oil- and gas-fired power plants and avoid the economic and environmental constraints of new construction. Methanol is a clean fuel that burns at a lower temperature than most petroleum-based fuels. Despite a successful test of methanol as a turbine fuel, however, its current high price and low production level are prohibitive unless new technology is developed. Studies by the Electric Power Research Institute on Texaco's coal gasifiers and Chem Systems' liquid-phase methanol processes for either a baseload plant or a flexible peaking plant are promising, but must both be adapted for utility use. 1 figure, 1 table. (DCK)

5370 **Alcohol fuels in Illinois: prospects and implications.** Rao, V.; Walzer, N. Macomb, IL; Western Illinois University (1981). 192p. Western Illinois University, Public Policy Research Institute, Macomb, IL 61455.

The use of corn to produce fuel alcohol offered major economic benefits for Illinois in the early 1970s. One of the advantages was increased employment in the alcohol-fuels industry and in the industries indirectly involved in alcohol production. The increased income generated by higher employment creates additional jobs throughout the economy. This report evaluates the employment increase by estimating the demand for gasoline and gasoline-alcohol fuels based on population and income trends - then determines the direct, indirect, and induced employment resulting from various market shares. Three appendices include an annotated bibliography of 21 references, a report on Brazilian experiences with alcohol fuels production, and a general bibliography. 128 references, 15 figures, 35 tables.

2960 Electric Power

REFER ALSO TO CITATION(S) 5063, 5064, 5069, 5077, 5120, 5121, 5122, 5123, 5124, 5125, 5126, 5257, 5300, 5306, 5318, 5369

5371 **Compatibility of fish, wildlife, and floral resources with electric-power facilities and lands: an industry survey analysis.** Leedy, D.L.; Dove, L.E.; Franklin, T.M. Washington, DC; Edison Electric Institute ([nd]). 144p. Edison Electric Inst., 1111 19th St. NW, Washington, DC 20036.

Details and an annotated bibliography expand a 1976 report on two surveys that focus on the voluntary steps taken by electric utilities to mitigate environmental impacts on plant and animal life near or on the facility, although some data from required actions are included. The report summarizes these findings. Examples showing how fish, wildlife, and floral resources are associated with utility facilities and the steps taken to protect and manage them include powerlines and rights-of-way, powerplant sites, hydroelectric facilities, and miscellaneous facilities and habitats. The report also cites examples of utility cooperation with governmental agencies to promote beneficial uses, conserve resources, promote recreation, and conduct research. 145 references. (DCK)

5372 **(CONF-820260—1) Electricity: the lowest-cost and highest-productivity form of energy.** Felix, F. (Gibbs and Hill, Inc., New York (USA)). 1982. 31p. Atomic Industrial Forum, Inc., Publications Department, 7101 Wisconsin Avenue, Washington, DC 20014. Order Number DE82906084.

From Atomic Industrial Forum workshop on nuclear power financing; Las Vegas, NV, USA (7 Feb 1982).

The advantages of electricity are that it is the lowest cost form of energy, achieves greatest conservation gains, and is the highest productivity form of energy, and its use is the key to manufacturing productivity, holds down the use of oil and gas, fights inflation, stimulates creativity and progress, and creates more jobs. The links between the growth of electric power generation and use, of total energy, and of the GNP in countries throughout the world are discussed. Finally, the low record of US economic growth and of electricity growth, the future of the US electric utility industry, and the necessity for increased electric power generation in order to propel the US toward economic recovery and greater energy independence are described. (LCL)

5373 (CONF-8110215—, pp 49-75) **Alternate responses to the financial crisis in the electric utility industry.** Bauer, D.C. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

This paper discusses the economic status of the industry as regards its present financial condition; construction commitments and requirements; expenditures and financial requirements (1981 to 1990); construction in the 1990s; effects of the 1981 Economic Recovery Tax; external financing; regulatory reform; licensing nuclear stations now under construction; taxation; rate and financial regulation; technical efficiency; diversification; and deregulation. An appendix with 15 tables summarizes the financial position of the industry. (PSB)

5374 **(DOE/EIA—0346) Effects of new plant and equipment expenditures on electricity prices.** Serot, D.E.; Makens, J.W. (USDOE Energy Information Administration, Washington, DC. Office of Coal, Nuclear, Electric and Alternate Fuels). Jul 1982. 34p. NTIS, PC A03/MF A01. Order Number DE82021872.

This report examines how electricity prices change over time and how expenditures for new plant and equipment influence the price path. Electricity prices are set by Public Utility Commissions so that the total revenue from the sales of electric power just equals the cost of producing that power. This means that the average unit price of electricity equals the average unit cost of production.

5375 **(DOE/EIA—0356/1) Projected costs of electricity from nuclear and coal-fired power plants. Volume 1.** Reynolds, A. (Department of Energy, Washington, DC (USA). Energy Information Administration). Aug 1982. 69p. NTIS, PC A04/MF A01. Order Number DE82021751.

The relative economic merit of nuclear versus coal-fired electricity generation for new plants beginning baseload service in 1995 is discussed. The year 1995 is a focal point because it roughly coincides with the time horizon required to bring a new nuclear plant into operation, starting with an initial investment decision today. It is assumed that nuclear and coal-fired generating plants represent the most coal-effective options for baseload service in the foreseeable future. Either option is expected to produce baseload power for one-half to one-third of the marginal running costs of operating existing oil- and gas-fired plants in the future. Comparative levelized bus-bar costs are projected for the ten standard federal regions of the United States in order to accommodate regional differences in labor and material costs, coal characteristics, and transportation distances and costs. Further, the major factors that affect coal and nuclear generation costs - licensing and construction lead-times, vintages of technology, cost of financing, and reliability - are investigated with a set of consistent underlying assumptions. The results show that nuclear power is projected to have at least a 5% cost advantage in the New England and South Atlantic regions, due primarily to the distance of these regions from major coal fields. On the other hand, the North Central and Southwest regions contain major coal fields and thus coal-fired plants are projected to have costs well below nuclear plants. For the rest of the nation, coal-fired and nuclear generation costs are projected to be within 5% of each other. This volume of the 2-volume report is an executive summary of the results.

5376 **(DOE/ER—0130) Projections of cost and on-site manual-labor requirements for constructing electric-generating plants, 1980-1990.** (Department of Energy, Washington, DC (USA). Office of Energy Research; Department of Labor, Washington, DC (USA). Construction Labor Demand System). Feb 1982. 112p. (DOL/CLDS/PP—3). NTIS, PC A06/MF A01. Order Number DE82016020.

Portions of document are illegible.

This report represents part of a continuing effort by the Federal Government to forecast the capital and labor required for constructing electric generating capacity additions necessary to accommodate projected economic and population growth in the US and its regions. Information is included on anticipated additions to electric generating capacity, labor requirements for these additions, capital cost requirements, and forecasting models. Coal-fired, nuclear, hydro, and pumped storage power plants are considered in these forecasts. (LCL)

5377 **(DOE/NBM—2021575) Alaska electric-power statistics, 1960-1981. Seventh edition.** (USDOE Alaska Power Administration, Juneau). Aug 1982. 51p. NTIS, PC A04/MF A01. Order Number DE82021575.

Portions of document are illegible.

This is the seventh in a series of statewide electric power data summaries compiled by the Alaska Power Administration (APA). It continues the efforts by APA to provide a convenient and current reference source on Alaska power system data and trends in statewide electric power use. Statistics are included for: installed generating capacity; percentage of various types of prime mover in the total generating capacity; annual growth in generating capacity; net energy generated; residential, commercial, and industrial power demand; peak loads, typical residential electric bills; and the location of existing transmission systems. (LCL)

5378 **(DOE/PE—0044) Close look at eight great energy myths with particular attention to the generation and use of electricity.** (USDOE Office of Policy, Planning and Analysis, Washington, DC). May 1982. 41p. NTIS, PC A03/MF A01. Order Number DE82021118.

This paper is to assess implications for the generation and use of electricity. Projections are compared with others prepared by the Energy Information Administration, DOE's Office of Policy, Planning and Analysis, and Energy and Environmental Analysis, Inc. Major differences in method, inputs, and results are identified, and to the extent possible, explained. Section II is a general summary of the review, and presents principal assumptions, methods, results, and major conclusions. Sections III, IV and V provide more detail to trace the analysis more closely. Section III, for example discusses some fundamental criticisms of the conceptual approach. Section IV, in contrast, accepts the basic framework but raises certain criticisms of the analysis within that framework. Section V discusses the treatment of electric generation in this paper, and probes the implications of the results.

5379 **(EPRI-EA—2552) Heuristic analysis of industry and economic effects of restrictions on generating capacity. Final report.** Hudson, E.A.; Kimball, C.E. (Jorgenson (Dale W.) Associates, Cambridge, MA (USA)). Aug 1982. 115p. NTIS, PC A06/MF A01. Order Number DE82906491.

A previous study, Industry and Economic Impacts of Restrictions on the Growth of Generating Capacity (EPRI Report, EA-1775), developed and applied an electricity-energy-economy modeling system to explore the effects of restrictions on nuclear and coal generating capacity and of varying capacity cost and fuel cost conditions. The present study develops a much more simple form (a heuristic model) of this detailed modeling system and applies this simple model to explain the previous results and to demonstrate the types and magnitudes of the causal relationships involved. As well as laying out some of the key relationships in the electricity-energy-economy modeling system, this simple model may be useful in permitting other analysts to perform their own studies, using new data and new information on possible restrictions, to estimate the effects caused by restrictions applying to the electric power industry.

5380 **(EPRI-EL—2549) Effect of distributed power systems on customer-service reliability.** Ma, F.S.; Patmore, J.W.; Sidenblad, K.M. (Systems Control, Inc., Palo Alto, CA (USA)). Aug 1982. 98p. NTIS, PC A05/MF A01. Order Number DE82906478.

The objective of this study was to determine how distributed power systems (DPSs), particularly those driven by solar and wind energy, affect service reliability. The study shows that conventional reliability analysis methods can be extended to handle DPSs. A variety of methods was considered, ranging from an exponential approximation suitable for rough hand calculations to sophisticated statistical methods suitable for computer analysis. It was found that many of the questions relating to DPS reliability derive from a paucity of data rather than a deficiency in analytic methods. In particular, data on the temporal and spatial correlation of fluctuating resources are needed.

5381 **(IDO—1735-1) Low-head hydro: an examination of an alternative energy source.** Gladwell, J.S.; Warnick, C.C. (comps.). (Idaho Univ., Moscow (USA). Water Resources Research Inst.). Sep 1978. Contract EG-77-C-07-1735. 205p. NTIS, PC A10/MF A01. Order Number DE82021807.

Portions of document are illegible.

The impact of fossil fuel shortages and of increased energy demand among the world's populations on low-head hydroelectric power development is reviewed followed by a discussion of the economics, legal and institutional aspects, turbine design requirements, environmental impacts, and energy potential of low-head hydropower plants. (LCL)

5382 **Electricity thefts surge in US; commercial meters rigged.** Tucker, L. *Energy User News;* 7: No. 31, 1, 14-15(2 Aug 1982).

Electric utilities are experiencing a surge of power thefts by commercial users, often with the help of professional meter riggers. Examples of how professional theft rings contract with users to steal power for restaurants, supermarkets, and fast-food franchises reveals the millions of dollars lost each year. The practice has increased as energy costs go up and as the economy remains in recession. Utilities warn that convicted thieves are fined and imprisoned, and that tampering with power meters can be very dangerous. (DCK)

5383 **Productivity-incentive clauses and rate adjustment for inflation.** Baumol, W.J. (Princeton Univ., NJ). *Public Utilities Fortnightly;* **110**: No. 2, 11-18(22 Jul 1982).

A successful approach to the regulatory problem of enabling utility companies to earn adequate revenues in an era of rapid inflation - while avoiding the disincentives to efficiency inherent in cost-plus arrangements and, at the same time, continuous or unduly frequent regulatory hearings - has long been sought but has seemingly eluded utility regulators. This article proposes a new approach to the problem and demonstrates why its prospects for success are optimal. The kind of productivity incentive clause that the author proposes is not to be regarded as a replacement for regulation but as a new and effective tool to be placed in the hands of regulators. 1 figure.

5384 **Changing environment for electric-power generation: portrait of a transition.** Bower, G.S.; Berg, M.R. (Univ. of Michigan, Ann Arbor). *Public Utilities Fortnightly;* **110**: No. 2, 19-31(22 Jul 1982).

The US electric-power industry faces serious problems in the midst of a period of dramatic changes in historic growth patterns, utility-management strategies, and generation-technology options. This article presents a portrait of this important transition as expressed by utility executives themselves in in-depth interviews conducted by the University of Michigan's Energy Policy Group. The authors build upon the wide-ranging results of the electric utility survey to draw implications for changes in federal power-generation policy and also suggest important guidelines for future utility assistance and regulation in the altered utility decision environment emerging over the next two decades. The survey responses reflect a willingness on the part of utilities to embrace new technologies and new policies. 4 references, 4 figures, 5 tables.

5385 **Utilities as lessors in tax-benefit-transfer leases.** Ewers, B.J. Jr.; Mol, T.H. (Northern States Power Co., Minneapolis, MN). *Public Utilities Fortnightly;* **110**: No. 2, 32-36(22 Jul 1982).

The Economic Recovery Tax Act of 1981 contains provisions which allow the transfer between corporate taxpayers of certain deductions and investment tax credits through special lease provisions. These lease provisions enable a company whose taxable income is relatively large to reduce its tax liability by obtaining entitlement to these tax benefits from a company with minor tax liabilities. This article describes the analytical framework by which one utility company determines whether resultant economic benefits justify its becoming a buyer of such tax benefits by becoming a lessor of the equipment giving rise to the tax benefits. 3 figures, 2 tables.

5386 **Capitalization of peak-power charges.** Boys, J.T. (Univ. of Auckland, New Zealand). *Energy Journal;* **55**: No. 7, 11-14(Jul 1982).

A new accounting procedure for electrical-supply authorities power boards relevant to the charges payable by them to the Electricity Division of the Ministry of Energy of New Zealand (NZE) is described. The scheme retains the traditional pricing structure for bulk electric power but, in operation, it offers economic advantages to the power boards, supply authorities, NZE, and to the New Zealand economy.

5387 **Stanley York: practicing the public interest.** Whitaker, R. *EPRI (Electric Power Research Institute) Journal;* **7**: No. 6, 24-29(Jul 1982).

Stanley York, former minister and state legislator, applies the principle of best judgment to his current role as chairman of Wisconsin's Public Service Commission and a member of the Electric Power Research Institute Advisory Council. York brings to the business world a philosophy of practicing what he formerly preached: that everyone's actions are flawed; therefore, decisions must be pragmatic. This approach eliminates the need to defend decisions and allows regulation to perform its function of constraining a business monopoly. York approaches the regulator's role in the adoption of new technology with both caution and independence, keeping public-interest considerations in line with those of investors. (DCK)

5388 **Electric utilities and the movement of coal.** Beier, F.J. (Univ. of Minnesota, Minneapolis). *Transportation Journal;* **21**: No. 4, 15-24(Sum 1982).

This paper examines the relationship between electric utilities and transportation modes, particularly concerning the movement of coal by railroad. As a point of reference, it reviews the transportation characteristics of existing coal-fired plants and examines transportation requirements for planned units. Comparisons are made between those utilities that have been successful in negotiating transportation rate/service packages and those that are still in the prearrangement stage. A number of problems are identified that have hindered negotiations for coal transport. Recommendations are made for altering or eliminating some of these problems. 8 references, 5 tables.

5389 **Electricity supply in Belgium.** de Vos, P.H. *Elektrizitaetswirtschaft;* **81**: No. 11, 344-347(24 May 1982). (In German).

In contrast to its neighbouring countries, Belgium has virtually no energy sources on its own territory. Consequently, the Belgian electricity-supply concerns have learned more from the energy crisis of the years 1973 to 1979 than any other European nation. Belgium has decided in favour of nuclear energy. The production and the distribution of electricity in Belgium lie predominantly in private hands. However, the country is a classical example of a mixed-distribution economy. Three private companies and a single public concern are engaged in the generation of electricity. They function as one efficient production body which can be regarded as a model for many European countries. Electricity distribution up to an output of 1000 kWh is the responsibility of the local community. Private and public concerns compete for a distribution concession that must be granted by a local community. In recent years and above all last year it was possible, as in several German and French communities, to offer industry competitive electricity tariffs.

5390 **Hydroelectric development and licensing procedures. Joint Hearing before the Subcommittee on Energy Regulation and the Subcommittee on Water and Power of the Committee on Energy and Natural Resources, United States Senate, Ninety-Seventh Congress, Second Session.** Washington, DC; Government Printing Office (1982). 179p.

Part 2 of the hearing record covers the testimony of five witnesses on the regulatory constraints and competition facing applicants for small hydro licenses. One way to cope with the increase in application filings submitted to the Federal Energy Regulatory Commission (FERC) would be to let states qualify for licensing authority. Also at issue are how to award development permits for contested sites and how filing and user fees can be set to cover the costs of licensing activities. The witnesses presented the views of the Fish and Wildlife Service, the Department of Agriculture, FERC's licensing division, and the States of Alaska and New Hampshire. Responses to additional committee questions and material submitted for the record follow the testimony. (DCK)

5391 **Pacific Northwest Electric Power Planning and Conservation Act. Hearing before the Subcommittee on Oversight and Investigations and the Subcommittee on Energy Conservation and Power of the Committee on Energy and Commerce, House of Representatives, Ninety-Seventh Congress, First Session, November 10, 1981.** Washington, DC; Government Printing Office (1982). 412p.

Hearings on the Bonneville Power Administration (BPA) performance under the Electric Power Planning and Conservation Act challenged: negotiating procedures; the concept of consensus building between fish and wildlife agencies, Indian tribes, and customers; the opportunities for public and subcommittee review; and BPA's business as usual approach to wildlife management. The testimony of eight witnesses representing BPA, the National Marine Fisheries Service, and other state and federal agencies is followed by additional material and responses submitted for the record. (DCK)

5392 **1982 summer assessment of overall reliability and adequacy of bulk power supply in the electric-utility systems of North America.** Princeton, NJ; North American Electric Reliability Council (1982). 21p. North American Electric Reliability Council, Research Park, Terhune Road, Princeton, NJ 08540.

Bulk power supply in the electric-utility systems of North America will be adequate to meet projected summer peak demand and electric-energy requirements. The interconnected transmission networks have sufficient strength and flexibility to avoid widespread cascading interruptions and to deliver power and energy to generation-deficient areas should emergencies arise. Utilities are continuing their efforts to transfer energy fron non-oil areas to oil-dependent areas. These transfers continue to cause certain portions of the transmission system to be operated at or near maximum safe loading levels a high percentage of the time. 4 tables.

5393 **Electric energy in Maryland: 1982 factbook.** Baltimore, MD; Maryland Electric Utility Council (1982). 17p. Maryland Electric Utility Council, Suite 404, Charles Center South, 36 South Charles St., Baltimore, MD 21201.

The 1982 FactBook contains power generation and consumption information on the entire utility industry in Maryland and on the five investor-owned utilities. Highlights from the third edition note that Maryland's demand growth of 9% per year in the late 60s and early 70s compared to 8% nationally. This has declined significantly due to conservation and decreasing business demands; a projected compound rate of growth through 1986 is 2.1% compared with 3.5% nationally. Although there is sufficient power available for current needs, the state must be planning for new generating capacity that will be needed in the 1990s. 3 figures, 2 tables. (DCK)

5394 **Annual committee reports on significant legislative, judicial, and administrative developments in 1981: Electric Power Committee.** *Natural Resources Lawyer;* **15**: No. 1, 139-199(1982).

Major legislation dealing with electric power during 1981 was aimed at increasing nuclear-power-plant safety and managing nuclear wastes, repealing prohibitions against using natural gas in the Powerplant and Industrial Fual Use Act, establishing a Superfund for hazardous wastes, and revising much of the support and incentives for solar energy. Legal actions challenged nuclear energy, the Clean Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, hydroelectric power, and the Public Utility Regulatory Policies Act. New administrative developments were primarily concerned with nuclear energy and an effort to work more closely with the nuclear industry to make licensing procedures more efficient. Other administrative changes were designed to streamline regulation and shift the focus to focus on cost-effectiveness. (DCK)

5395 Supply of electricity after declaration of bankruptcy: Is the electricity bill to be paid out of the bankrupt's estate in case of the bankruptcy commissioner having failed to make a clear statement in accordance with Sect. 17 of the Bankruptcy Act. *Betriebstechnik;* **34**: No. 46, 2319-2320(13 Nov 1981). (In German).

If the electricity supply of a commercial enterprise of the joint insolvent debtor is continued after declaration of bankruptcy in accordance with an existing special rate contract, the utility company may not take it for granted that the bankruptcy commissioner has chosen to continue fulfilment of the contract even if the utility company has not received a clear statement in accordance with Sect. 17 of the Bankruptcy Act. Decision of the Supreme Court of the FRG, VIII ZR 168/80, dated July 1, 1981.

5396 Limitation of a claim for payment of arrears due to an error in reading off the current meter. *Betriebstechnik;* **34**: No. 46, 2320-2322(13 Nov 1981). (In German).

Decision of the Court concerning the limitation of a claim of electric utilities for payment of electricity supplied, if the power consumption is recalculated subsequent to an error in reading off the consumer's current meter. (Supreme Court of the FRG, decision of July 8th, 1981 - VIII ZR 222/80).

5397 Cogeneration and small power production: state implementation of Section 210 of PURPA. Lock, R.H.J.H.; Van Kuiken, J.C. *Solar Law Reporter;* **3**: No. 4, 659-701(Nov 1981).

State public utility commissions (PUCs) are required by Section 210 of the Public Utility Regulatory Policies Act of 1978 (PURPA) to implement rules promulgated by the Federal Energy Regulatory Commission (FERC) governing the purchase of electric power by utilities from qualifying cogeneration and small power production facilities (QF's). Some states have completed their initial implementation obligations; most are still in the implementation stage. Most states initially concentrated on setting rates for purchases of power from smaller QF's. These rates will act as an early price signal for QF development, particularly important to smaller QF's needing to persuade financial backers of the adequacy of revenue streams, and will provide a useful experience base for future dealings with larger QF's. The common issues and problems emerging from these early state implementation proceedings are reviewed, compared, and commented upon.

2980 Consumption And Utilization

REFER ALSO TO CITATION(S) 5050, 5067, 5254, 5257

5398 (CONF-8110215—, pp 112-119) **Oil and natural gas supply.** Flom, E.L. 1981. NTIS, PC A08/MF A01. Order Number DE82018954.

From 9. annual Illinois energy conference - Illinois energy policy: new directions for the eighties; Chicago, IL, USA (28 Oct 1981).

The author discusses energy needs and forecasts supplies for the year 2000 in the US in terms of petroleum and natural gas. He makes a case for deregulation. (PSB)

5399 Energy situation in the Arab world: Kingdom of Saudi Arabia. *OAPEC (Organization of Arab Petroleum Exporting Countries) News Bulletin;* **8**: No. 8/9, 3-4(Aug-Sep 1982).

This is the fourth in a series of reports on the Kingdom of Saudi Arabia, which has increased its annual rate of economic growth from 12% during the 1966-1970 period to 31% between 1973-1980. The report covers the increasing consumption of petroleum, with a breakdown by sector; the development of natural gas and its use for water desalination; and the development and use of new and renewable energy sources, specifically photovoltaic cells and other solar applications. 2 tables. (DCK)

5400 Energy situation in the Arab world: Democratic Republic of Sudan. *OAPEC (Organization of Arab Petroleum Exporting Countries) News Bulletin;* **8**: No. 8/9, 5-7(Aug-Sep 1982).

Petroleum products provide 98% of Sudan's commercial energy and 21.63% of its total energy. Irrigation has kept Sudan from developing hydropower resources, which now provide only 2% of commercial and 1.03% of total energy. Biomass is the primary household fuel, and provides 75% of total energy used. The government plans to develop new and renewable energy sources will focus on the potential of solar and wind power for rural areas. 1 table. (DCK)

5401 Managing energy on a giant scale. *Modern Industrial Energy;* **61**: No. 4, 13-14(Apr 1981).

Energy conservation policy by Deere and Co., particularly in its Dubuque (Iowa) plant, is described. The 5.3 million ft^2 plant on 1465 acres has a power consumption (daily) of 625,000 kWh, 7 million gal of water, 400 tons of coal (winter) and 2.75 million cf of gas. Energy management (6 people) has a goal (annually) of a 4% reduction in energy for each ton of finished product (mainly heavy industrial equipment). Division into departments (energy zones) and metering of energy is described including steam and large air lines. The tracking and recording of all forms of energy use (particularly in high energy use areas) are discussed and some problems encountered are described. Some energy conservation measures are mentioned including: (1) conversion from gas to coal generated steam; (2) soliciting employee cooperation to energy conservation; and (3) purchasing a trash-burning facility at a cost of $1 million. For the future, plans exist to improve metering of energy use by using meters with pressure and/or temperature compensation and tying in all meters into a central control and monitoring computer system. (MJJ)

2990 Unconventional Sources And Power Generation

REFER ALSO TO CITATION(S) 5063, 5064, 5150, 5234, 5252, 5253, 5318, 5338, 5370

5402 (CONF-811249—) Conference on legal aspects of geothermal development. (Geothermal Resources Council, Davis, CA (USA); American Bar Association, Chicago, IL). 1981. 271p. Geothermal Resources Council, P.O. Box 98, Davis, CA 95617. Order Number DE82902752.

From Conference on legal aspects of geothermal development; Newport Beach, CA, USA (3 Dec 1981).

Portions of document are illegible.

Fifteen papers and abstracts are included. Separate abstracts were prepared for six papers and nine abstracts were listed by title.

5403 (CONF-811249—, pp 28p, Section II) **Geothermal sales contracts.** Humphrey, R.L. (Union Oil Co., Los Angeles, CA); Parr, C.J. 1981. Geothermal Resources Council, P.O. Box 98, Davis, CA 95617. Order Number DE82902752.

From Conference on legal aspects of geothermal development; Newport Beach, CA, USA (3 Dec 1981).

Contracts for the sale and purchase of high temperature geothermal steam for the generation of electric power are discussed. The following topics are covered: dedication of the resource; term;

development; subsequent generation facilities; generating plant siting; production; pricing methods; indemnification, warranties, and damages; and relief for failure to perform.

5404 (CONF-811249—, pp 29p, Section IV) **Water law and the development of geothermal resources.** Olpin,. O.; Thompson, B.H. (O'Melveny and Meyers, Los Angeles, CA). 1981. Geothermal Resources Council, P.O. Box 98, Davis, CA 95617. Order Number DE82902752.

From Conference on legal aspects of geothermal development; Newport Beach, CA, USA (3 Dec 1981).

Western water law is surveyed briefly. The necessity of abiding by state water law in geothermal development is discussed and compliance problems under state groundwater law are described. Some possible ways out of the conflicts are presented and some recommendations are made for both geothermal developers and for the state.

5405 **(DOE/CS/24312—4) Questions and answers about energy recovery from waste.** (One America, Inc., Washington, DC). Sep 1982. Contract AC01-80CS24312. 29p. NTIS, PC A03/MF A01. Order Number DE82022154.

Questions and answers about the developing waste-to-energy industry are presented. They are intended as a ready reference for the general public and others interested in exploring the option of utilizing municipal waste as a renewable energy resource. Questions have been researched and answered in six broad categories: (1) General Information; (2) State-of-the-Art; (3) Economics/Financial; (4) Environmental; (5) Institutional; and (6) Project Implementation.

5406 **(DOE/CS/50025—2) Alcohol as a fuel for farm and construction equipment.** Borman, G.L.; Foster, D.E.; Meyers, P.S.; Uyehara, O.A. (Wisconsin Univ., Madison (USA)). Jun 1982. Contract AC02-79CS50025. 33p. NTIS, PC A03/MF A01. Order Number DE82021022.

Work in three areas dealing with the utilization of ethanol as fuel for farm and construction diesels is summarized. The first part is a review of what is known about the retrofitting of diesels for use of ethanol and the combustion problems involved. The second part is a discussion of the work that has been done under the contract on the performance of a single-cylinder, open-chamber diesel using solutions and emulsions of diesel fuel with ethanol. Data taken include performance, emissions and cylinder pressure-time for diesel fuel with zero to forty percent ethanol by volume. Analysis of the data includes calculation of heat release rates using a single zone model. The third part is a discussion of work done retrofitting a multicylinder turbocharged farm tractor diesel to use ethanol by fumigation. Three methods of ethanol introduction are discussed; spraying ethanol upstream and downstream of the compressor and prevaporization of the ethanol. Data on performance and emissions are given for the last two methods. A three zone heat release model is described and results from the model are given. A correlation of the ignition delay using prevaporized ethanol fumigation data is also given. Comparisons are made between fumigation in DI and IDI engines.

5407 **(DOE/EIA—0341) Estimates of US wood energy consumption from 1949 to 1981.** (Department of Energy, Washington, DC (USA). Energy Information Administration). Aug 1982. 153p. NTIS, PC A08/MF A01. Order Number DE82020578.

The methodologies used to estimate historical levels of wood consumption in the residential, commercial, industrial, and utility sectors nationally from 1949 to 1981, by State for 1960 to 1983, and nationally by month for 1973 to 1981 are described. The wood consumption estimates are presented.

5408 **(DOE/ET/20279—216) Market and economic analysis of residential photovoltaic systems: final report.** Tabors, R.D. (Massachusetts Inst. of Tech., Cambridge (USA). Energy Lab.). Jun 1982. Contract AC02-76ET20279. 42p. NTIS, PC A03/MF A01. Order Number DE82021955.

The market/economic implications of the effort in development and testing of residential photovoltaic power systems are evaluated. Summarized is work in the areas of market surveys, evaluation of previous work in user worth analysis in the residential sector, including retrofit applications, evaluation of presently available regional, econometric housing models which could be used to project housing stocks, and the analysis of retrofit potential for residential photovoltaic power systems given available roof area. The work reported represented, in general, the first steps in an anticipated ongoing research effort to monitor and evaluate the market potential for both new and retrofit residential photovoltaic systems in conjunction with the Lincoln Laboratory Solar Photovoltaic Residential Project. The overall structure of the project is described and its experience to date evaluating the US residential photovoltaic market or markets is summarized.

5409 **(DOE/JPL—1060-55) Solar-thermal technologies benefits assessment: objectives, methodologies, and results for 1981.** Gates, W.R. (Jet Propulsion Lab., Pasadena, CA (USA)). Jul 1982. Contract AM04-80AL13137. 44p. (JPL-PUBL—82-70). NTIS, PC A03/MF A01. Order Number DE83000475.

The future economic and social benefits of developing cost-competitive solar thermal technologies (STT) were assessed during FY 81. The analysis was restricted to STT in electric applications for 16 high-insolation/high-energy-price states. Three fuel price scenarios and three 1990 STT system costs were considered, reflecting uncertainty over future fuel prices and STT cost projections. After considering the numerous benefits of introducing STT into the energy market, three primary benefits were identified and evaluated: (1) direct energy cost savings were estimated to range from zero to $50 billion; (2) oil imports may be reduced by up to 9 percent, improving national security; (3) significant environmental benefits can be realized in air basins where electric power plant emissions create substantial air pollution problems. STT R & D was found to be unacceptably risky for private industry in the absence of federal support. The normal risks associated with investments in R & D are accentuated because the OPEC cartel can artificially manipulate oil prices and undercut the growth of alternative energy sources. When this fact was weighed against the potential benefits of developing cost-competitive STT, Federal participation in STT R & D was found to be in the national interest.

5410 **(DOE/NBM—2019085) Solar cogeneration.** (Sandia National Labs., Livermore, CA (USA)). Apr 1982. Contract AC04-76DP00789. 20p. NTIS, PC A02/MF A01. Order Number DE82019085.

Portions of document are illegible.

After a brief introduction to the operational principles and advantages of solar cogeneration, seven cogeneration studies are summarized covering such applications as sulfur mining, copper smelting, enhanced oil recovery, natural gas processing, sugar mill operations, and space heating and cooling. For each plant is given a brief site description, project summary, conceptual design, and functional description, including a picture of the facility and a flow chart. Also listed are the addresses of the companies involved for obtaining additional information. (LEW)

5411 **(DOE/R5/10242—T1) Feasibility study of wind-generated electricity for rural applications in southwestern Ohio. Final technical report.** Kohring, G.W. (Kohring (Gene W.), Hamilton, OH (USA)). 1982. Contract FG02-80R510242. 29p. NTIS, PC A03/MF A01. Order Number DE82021596.

This study is designed to investigate the parameters associated with domestic production of wind generated electricity for direct use by small farms and rural homes in the southwestern Ohio region. The project involves direct utility interfaced electricity generation from a horizontal axis, down-wind, fixed pitch, wind powered induction generator system. Goals of the project are to determine: (1) the ability to produce useful amounts of domestic wind generated electricity in the southwestern Ohio region; (2) economic justification for domestic wind generated electrical production; and (3) the potential of domestic wind generated electricity for reducing dependence on non-renewable energy resources in the southwestern Ohio region.

5412 **(GAO/EMD—82-42) Earlier effective monitoring of alcohol-fuels projects may have minimized problems.** (General Accounting Office, Washington, DC (USA). Energy and Minerals Div.). 23 Apr 1982. 16p. General Accounting Office, PO Box 6015, Gaithersburg, MD 20760. Order Number DE82906034.

Report to Representative Virginia Smith.

Although the Department of Energy's system for monitoring projects for the development and production of alcohol fuels now seems effective, it was not established until 7 months after some of the projects started and after major portions of them were constructed. This contributed to problems which may result in some projects not being completed after substantial portions of project funds were spent. GAO also found that 24 grantees scheduled to be paid on a reimbursable basis were erroneously advanced about $3 million. Of those grantees, only five returned a total of $378,110; and by the time the errors were detected, grantees had spent the balance of the funds advanced. Earlier effective monitoring may have detected the errors sooner, enabled more advances to be returned, and prevented a weakening of the Department's oversight and control over the projects. GAO makes recommendations that could help future projects from starting without effective monitoring.

5413 **(IDO—10104) Results of the feasibility studies awarded under PL 96-126 and PL 96-304 for alcohol fuel production. Final report.** Hosking, R.W.; Anderson, J.V.; Jones, K.W.; Plaster, D.S. (Idaho National Engineering Lab., Idaho Falls (USA)). 1 Mar 1982. Contract AC07-76ID01570. 110p. NTIS, PC A06/MF A01. Order Number DE82015410.

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The results from the feasibility study grants are summarized. The grants were to allow assessment of the technical and economic feasibility of construction and operation of commercial-scale alcohol fuel production facilities. Summarized are the process designs, financial and economic analyses, marketing analyses, and the environmental assessments. Use of current technology was declared to be adequate; no patents evolved from the studies. Suitable sites, served by transportation and utilities were located. Feedstock, energy sources, and raw materials were determined to be available. Environmental guidelines were found to be attainable and socioeconomic impacts and public acceptance of the projects were reported. Most of the proposed plants were declared to be economically feasible with profitability increasing with plant size. Financing was reported constrained by premium interest rates, an insecure ethanol market, and financial institution requirements for loan guarantees or high-equality loans.

5414 **(MASEC-SCR—81-011) Financial barriers to the use of solar-industrial-process heat.** (Mid-American Solar Energy Complex, Minneapolis, MN (USA); Western Reserve Associates, Cleveland, OH (USA)). Mar 1981. Contract AC02-79CS30150. 94p. NTIS, PC A05/MF A01. Order Number DE82013429.

Portions of document are illegible.

Industry concerns about solar process heat, attitudes toward investment in solar process heat, and decision processes and factors are reported. Four cases were selected from among 30 potential solar process heat installations that had been carried through the design stage, and case was analyzed using discounted cash flow to determine what internal rate of return would be earned under current tax laws over 10 years. No case showed any significant rate of return from capital invested in the solar installation. Several possible changes in the cost of solar equipment, its tax treatment or methods of financing were tested through computer simulation. A heavy load of extra tax incentives can improve the return on an investment, but such action is not recommended because they are not found to induce adoption of solar process heat, and if they were effective, capital may be drawn away from applications such as conservation were the potential to improve the nation's energy dilemma is greater. Tax shelter financing through limited partnership may be available. (LEW)

5415 **(NP—2906085) Guide to financing: small-scale geothermal energy projects.** (Allen (Eliot) and Associates, Inc., Salem, OR (USA)). Apr 1982. 29p. NTIS, PC A03/MF A01. Order Number DE82906085.

A brief overview is given of the current financing sources for projects requiring $1 million or less in capital investment and the major considerations commonly encountered in assembling financing. A directory of technical and financial assistance and a glossary of geothermal/financial terms are included.

5416 **(ORAU/IEA—82-7(M)) Geothermal-resource survey of the Tennessee Valley Region.** Staub, W.P.; Treat, N.L. (Oak Ridge Associated Universities, Inc., TN (USA)). Aug 1982. Contract AC05-76OR00033. 133p. NTIS, PC A07/MF A01. Order Number DE82021951.

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An overview appraisal of the geothermal resources in the Tennessee Valley Region revealed geothermal resources of potential usefulness in two of 13 subregions: the New Madrid Seismic Zone and the central segment of the Northern Gulf Coastal Plain. The appraisal was based on geologic features of the region (hot springs, groundwater aquifers, and structure) and temperature data for oil and gas wells and shallow water wells. Site-specific exploration for economic appraisal was not carried out. The geothermal gradient for each of the subregions was established by linear regression of all of the bottom-hole temperature data for the oil and gas wells. A routine statistical procedure identified all unusually warm wells within each subregion, and their locations were plotted. Hot spots in a subregion were identified by localized clustering of such wells in numbers exceeding statistical expectations based on the intensity of drilling activity. Of the two areas most likely for extraction of geothermal energy, the New Madrid Seismic Zone has a high geothermal gradient at shallow depths (less than 500 meters). However, the higher gradient does not continue at greater depth since convective circulation is the probable cause of the higher-than-normal groundwater temperatures. Although a high geothermal gradient does persist at depth in the central segment of the Northern Gulf Coastal Plain, engineering problems are likely to hinder the current economic use of geothermal energy in this subregion. The extraction of geothermal resources in the 11 other subregions is not considered to be feasible at present because (1) the heat source is too deep, or (2) there are no suitable aquifers.

5417 **(P—700-82-005) Cumulative impacts study of The Geysers KGRA: public-service impacts of geothermal development.** Matthews, K.M. (California Energy Resources Conservation and Development Commission, Sacramento (USA)). May 1982. 277p. NTIS (US Sales Only). Order Number DE82905249.

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Geothermal development in The Geysers KGRA has affected local public services and fiscal resources in Sonoma, Lake, Mendocino, and Napa counties. Each of these counties underwent rapid population growth between 1970 and 1980, some of which can be attributed to geothermal development. The number of workers currently involved in the various aspects of geothermal development in The Geysers is identified. Using three different development scenarios, projections are made for the number of power plants needed to reach the electrical generation capacity of the steam resource in The Geysers. The report also projects the cumulative number of workers needed to develop the steam field and to construct, operate, and maintain these power plants. Although the number of construction workers fluctuates, most are not likely to become new, permanent residents of the KGRA counties. The administrative and public service costs of geothermal development to local jurisdictions are examined and compared to geothermal revenues accruing to the local governments. Revenues do not cover the immediate fiscal needs resulting from increases in local road maintenance and school enrollment attributable to geothermal development. Several mitigation options are discussed, and a framework is presented for calculating mitigation costs per unit of public service.

5418 **(SAND—81-7019(Vol.2)) Study of photovoltaic residential retrofits. Volume II. Main report.** Mahone, D.E.; Temple, P.L.; Adams, J.A.; Chalmers, B.B.; Motter, A.D.; Millner, A.E. (Sandia National Labs., Albuquerque, NM (USA); T.E.A., Inc., Harrisville, NH (USA); TriSolar Corp., Bedford, MA (USA)). Apr 1982. Contract AC04-76DP00789. 267p. NTIS, PC A12/MF A01. Order Number DE82015626.

The problems and potentials for widespread residential retrofits of PV power systems are analyzed. Included are data on the existing housing stock, designs for array mounting and system electrical wiring, and economic analyses for retrofits.

5419 **(SAND—82-8235) Conceptual design report of a refuse-fired steam plant.** Bedinger, L.B. (Sandia National Labs., Livermore, CA (USA)). Aug 1982. Contract AC04-76DP00789. 40p. NTIS, PC A03/MF A01. Order Number DE82021074.

This is a conceptual design report for the installation of a refuse-fired boiler to produce steam. The refuse, mostly paper waste, would come from two adjacent facilities, Sandia National Laboratories, Livermore and Lawrence Livermore National Laboratory. The new steam plant, to be located at SNLL, would produce close to 100% of the steam requirements at SNLL. Unfortunately it does not have an attractive payback.

5420 **(SERI/TR—09275-2) User's guide to SERICOST: a computer program for estimating electric utility avoided cost.** (Solar Energy Research Inst., Golden, CO (USA); Madison Consulting Group, WI (USA)). May 1982. Contract AC02-77CH00178. 91p. NTIS, PC A05/MF A01. Order Number DE82016380.

Portions of document are illegible.

Computer models have been developed that can be used to estimate technology-specific avoided cost rates for electric utility purchases from qualifying distributed power producers, as required by Section 210 of the Public Utility Regulatory Policies Act of 1978. SERICOST is a modified version of MARGINALCOST, the marginal cost estimation model. SERICOST calculates the electric utility's avoided cost by time period, independent of the type of technology used by the qualifying facility. SERICOST and the companion model SERICPAC, used in combination, calculate average annual avoided cost rates for wind turbines, low-head hydro facilities, and several biomass systems.

5421 **(TVA/OACD—82/16) Programmatic environmental overview. Biomass fuels program.** Roetheli, J.C.; Betson, R.P.; Bohac, C.E. (Tennessee Valley Authority, Muscle Shoals, AL (USA)). Jul 1982. 24p. NTIS, PC A02/MF A01. Order Number DE82906065.

Some potential environmental issues related to use of renewable biomass resources as fuels are identified. Possible management strategies for eliminating or holding the consequences within manageable bounds are suggested. Production impacts are discussed as follows: soil erosion, water quality, soil/stand productivity, and aesthetics, wildlife, and related areas. Conversion and combustion impacts on air quality, water quality, and solid wastes are described.

5422 **(UCID—19500) Overview of solar-energy systems for electricity production: comparison by cost and efficiency.** Whitehead, J.C. (Lawrence Livermore National Lab., CA (USA)). 23 Jul 1982. Contract W-7405-ENG-48. 27p. NTIS, PC A03/MF A01. Order Number DE82022516.

Pertinent data are tabulated for eight solar energy conversion methods: algal biomass, agricultural biomass, biophotolysis, salt gradient solar pond, ocean thermal energy conversion, concentrated solar thermal power, silicon solar cells, and propeller wind turbines. Justifications are given for the table entries. For each system, the theoretical maximum efficiencies of the energy conversion steps are compared with actual obtained values, and attempts are made to explain the differences. (LEW)

5423 **(WAOENG—82-03) Institutional and financial guide to geothermal district heating. Serial No. 2.** (Washington State Energy Office, Olympia (USA)). Mar 1982. Contract FG07-79R000079. 29p. NTIS, PC A03/MF A01. Order Number DE82020567.

General planning considerations that affect nearly every community are discussed, and alternative operating structures available to communities are reviewed, including local governments, nonprofit cooperatives, private enterprises, and joint ventures. The financing options available to publicly-owned and privately-owned district-heating systems are then summarized. The geothermal production and distribution activities most appropriate to each type of operating structure are reviewed, along with typical equity and dept-funding sources. The tax advantages for private developers are described, as are the issues of customer contracts and service prices, and customer retrofit financing. The treatment is limited to an introductory overview. (LEW)

5424 **(WAOENG—82-04) Guide to a geothermal heat plan: a geothermal energy application. Serial No. 3.** (Washington State Energy Office, Olympia (USA)). Mar 1982. Contract FG07-79R000079. 39p. NTIS, PC A03/MF A01. Order Number DE82020591.

The concept of a heat plan is introduced so that local officials may become familiar with thermal considerations and determine which options deserve further study and action. The approach for formulating a heat plan is a two-part process where heat resources and end-uses are first characterized in a heat atlas and then acted upon according to goals and strategies embodied in the plan. The purpose of the atlas is to systematically monitor a community's thermal supplies and demands, and to catalog them in the same manner as other community development sectors. The heat plan contains thermal goals and implementation measures based on conditions and opportunities revealed in the atlas. The heat demands considered in the atlas include space, water, and industrial process heat demands. Thermal resources considered include those conventional fuels already in use, as well as those alternate energy resources which have potential for utilization. (LEW)

5425 **Photovoltaics: a quiet revolution.** *Energy Detente;* **3**: No. 14, 1-8(14 Oct 1982). (In English and Spanish).

Despite persistent petroleum-market softness discouraging development of alternative energy in general, a quiet revolution is taking place with the emerging solar technology known as photovoltaics. Interest in this potential is keen in several developing countries, where oil-import bills since the last price shock are still a terrible burden. The total world market for photovoltaic devices in 1977 was about US $8.6 million. By 1979, this figure more than doubled, to US $19.6 million. World solar sales nearly tripled in the following two years, increasing to US $55.4 million in 1981. World solar sales are expected to grow to nearly US $84 million by the end of 1982. Projection of future market trends vary but reflect an expectation of continued accelerated growth. A recent report by the New York-based market research firm, Frost and Sullivan, estimates that the total market for complete systems could reach more than US $1 billion by the end of the decade. This company further projects a potential world market exceeding US $2 billion by 1995 and $10 billion by 2005. According to Photovoltaic Energy Systems, Inc., a Virginia, US-based consultancy, world solar sales volumes could grow to US $120 million in 1983, $300 million in 1985, $1.5 billion in 1990, and $10 billion by 2000. After presenting the basis of photovoltaics (how they work), this issue also addresses competing photovoltaic technologies and research options. Also, this issue updates the fuel price/tax series for the Eastern Hemisphere countries.

5426 **Net energy analyses of ethanol production from sugarcane in northeast Brazil.** Khan, A.S. (Univ. Federal do Ceara, Fortaleza, Brazil); Fox, R.W. *Biomass;* **2**: No. 3, 213-221(Jul 1982).

Net energy analyses of alcohol production from sugarcane production technologies based on intensive use of fertilizer (System I) and on improved cultural practices without chemical fertilizer (System II) were considered. The energy analysis considered the

total system inputs. The results indicate that both systems are almost equally efficient in terms of energy ratio.

5427 Evaluating passive's potential. Nesbit, W.; Purcell, G. *EPRI (Electric Power Research Institute) Journal;* 7: No. 6, 18-23(Jul 1982).

A flexible computer program compares the costs and thermal performance of passive solar homes with a conventional house and a well-insulated energy-conservation home. The energy-conservation home and passive solar homes significantly outperformed the conventional home at each of four sites and in each of the four comparison areas of kWh use, system load, fuel costs, and generation reliability. The best passive solar house performed incrementally better than the energy-conservation house on the heating-load-dominated systems and roughly-equivalent to the energy-conservation house on the cooling-load-dominated system. Several utilities are now using the model to explore the potential impact of passive solar design in their service areas. 2 figures.

5428 Wind energy: a renewable alternative. Mikhail, A. (Solar Energy Research Inst., Golden, CO). *Energy Detente;* 3: No. 5, 1-8(10 May 1982). (In English and Spanish).

Global energy demand, some 50-billion barrels of oil equivalent for the year 1980, continues to grow as populations and national economies develop and expand. This trend breaks with natural order: fossil fuels become inevitably scarce, the earth becomes polluted, the word crisis attaches itself to energy, pointing to a dead end for the spiral of human prosperity. Meanwhile, around us circulates a clean, free, and renewable resource: the power in the wind, distributing some 688-billion barrels oil equivalent Theoretically, just 7% of that power could, if harnessed, satisfy current world energy demand. Although it is certainly unreasonable to seek to employ all of this wind power at once, it is also unreasonable to leave this tremendous resource virtually untapped when every nation could benefit from further diversification of the energy menu to include the renewables. Here, Dr. Mikhail joins Energy Detente in sharing his global experiences regarding wind power: the resource, applications, and economics and a view of how to harmonize human needs with the ecology of the planet we live on.

5429 Mandatory utility financing of conservation and solar measures. Colton, R.D. *Solar Law Reporter;* 3: No. 5, 767-780(Jan 1982).

Arguments, pro and con, are put forth concerning the questions: (1) do state utility authorities have the power to require utilities to provide services such as mandatory financing of conservation and solar measures; and (2) are services such as conservation and solar efforts subject to state regulation as far as utilities are concerned. Following an introduction, the concept of full energy services is discussed as well as the legal basis for mandatory financing. After consideration of both sides of the issue it is concluded that the role of public utility companies in providing adequate service needs to be redefined. 66 references. (MJJ)

5430 Use and implementation of solar energy equipment standards. Lawrence, W.; Minan, J. *Solar Law Reporter;* 3: No. 5, 781-807(Jan 1982).

The concept of standards is discussed followed by the development and uses of solar standards. The concept of voluntary standards is treated and it is pointed out that most standards in the USA are produced through the voluntary consensus system. Organizations involved in preparing standards for solar energy equipment (ASTM, ASHRAE, ASME, UL, ANSI) are described and it is pointed out that the solar industry could operate through voluntary industry participation. Mandatory standards and their imposition by state and federal governments are discussed in detail. Laws passed by California and Minnesota are used as examples. Factors such as building codes, tax incentives, information disclosure, guidelines, test methods, certification programs, and installation practices are discussed. It is concluded that, to avoid proliferation of too many separate sets of standards, Congress should consider requiring states to adopt nationwide standards that are flexible to apply in all regions (once such standards are derived). 115 references. (MJJ)

5431 Case study: Florida mandatory standards. Beach, C.D.; Kettles, C.M. *Solar Law Reporter;* 3: No. 5, 808-821(Jan 1982).

The introduction of a state standards program (1976) in Florida, administered by the Florida Solar Energy Center (FSEC), is described. Limited to solar collectors, collector manufacturers were not initially required to comply with the standards but most manufacturers joined the program because of competitive pressures and pressures from a federally funded rebate program. Legislative history of the program (beginning in 1974) is described as well as industry compliance and enforcement through the building permit and inspection process. Solar standards and codes, program operation, technical criteria and certification are discussed as well as coordination with national efforts. Objections to the standards as well as possible challenges (none as yet) are considered. The current status of the program is reviewed. It is concluded that, although the state law failed to provide for enforcement of the standards, the FSEC is hopeful that a model enforcement ordinance will eventually be adopted by local governments. 26 references. (MJJ)

5432 Deforestation in India. Bowonder, B. (Coll. of India, Hyderabad). *International Journal of Environmental Studies;* 18: No. 3-4, 223-236(1982).

This study analyses in detail the major reasons for deforestation in India and its inter-relationship with the economic development. A number of factors like diversion of forest land for agriculture, irrigation and power projects, industrial establishments, roads, tribal colonies, settlement of evicted persons, besides the indiscriminate private encroachments account for the depletion of the forests. A comprehensive summary of the developmental interactions of forest resources depletion is given. Most of the developmental activities have a destructive influence on forestry.

5433 Leaders in change: solar energy owners and the implications for future adoption rates. Sawyer, S.W. (Univ. of Maryland, College Park). *Technological Forecasting and Social Change;* 21: 201-211(1982).

Information on the characteristics of the initial wave of homeowners who installed solar-energy systems is presented and then used to anticipate future solar-market-penetration patterns. Surveys of these adopters reveal high education and income levels; professional and executive occupations; economic, energy-saving, and environmental concern as the principal purchase motivations; and high-satisfaction levels. As a group, these individuals conform to the early adopter type identified in innovation diffusion research rather than the innovator type that would be expected at this early stage of commercialization. This characteristic, the influence of economic motivations, owners' high-satisfaction levels, and the findings of other surveys indicate that widespread solar-system adoption is probable if the initial-high-cost barrier can be reduced.

5434 State tax incentives for solar and alternative energy systems. Morris, M.M. McLean, VA; Brick Institute of America (1982). 12p. Brick Institute of America, 1750 Old Meadow Road, McLean, VA 22102 $2.00.

A summary of tax incentives for using renewable-energy equipment and materials is organized alphabetically by state. The incentives include a variety of strategies for tax credits, deductions, and exemptions. Passive-solar systems must usually contain collection, absorption, storage, distribution, and regulation components to qualify, but the states vary in how they interpret qualifications. (DCK)

5435 Builder's guide to solar construction. Schwolsky, R.; Williams, J.I. New York, NY; McGraw-Hill Book Company (1982). 272p. McGraw-Hill Book Company, 1221 Ave. of the Americas, New York, NY 10020 $32.50.

A complete analysis is provided, primarily directed towards builders, on incorporating the latest advances in passive solar heating and energy conservation in the design of single-family residences. Also considered are materials, construction techniques, siting, and theory necessary for the planning and construction of solar homes. Topics include passive solar heating options, sun-tempering, glazing, thermal storage, sunspaces, attached greenhouses, insulation (moveable and fixed), earth sheltering, domestic hot

water (solar), effects of climate, solar cooling, and others. A step-by-step approach is used. In addition, an analysis is given to show how five builders made the transition to solar construction using specific case studies.

5436 Annual committee reports on significant legislative, judicial, and administrative developments in 1981: Alternate Energy Sources Committee. *Natural Resources Lawyer;* **15**: No. 1, 65-137(1982).

The annual report covers new legislative, judicial, and administrative activities during 1981 covering alcohol fuels, cogeneration/dispersed power generation, solar/conservation, and synthetic fuels. The 1981 budget cuts eliminated or reduced many of the programs initiated by the Carter administration. A variety of tax credits and incentives, loan guarantees, and proposals to ease Regulatory restrictions reflect the philosophical shift in government policies. The appendix gives a status report on state implementation plans for the Public Utility Regulatory Policies Act of 1978. 3 tables. (DCK)

5437 Handbook of conservation and solar energy: trends and perspectives. Hunt, V.D. New York, NY; Van Nostrand Reinhold Company Incorporated (1982). 404p. Van Nostrand Reinhold Company, 135 W. 50th Street, New York, NY 10020.

A comprehensive overview of energy conservation and solar energy, this book covers the major thrusts and strategies of current programs. Hunt discusses the key roles played by government and the private sector. He also details the gamut of new and recently developed technologies that are involved in conservation and the use of alternate energy sources. Passive and active solar energy, photovoltaics, biomass, alcohol fuels, wind energy, solar thermal energy, and conservation technology all receive integrated coverage. 99 references, 106 figures, 81 tables.

5438 Halcon to develop ethanol-based processes in Brazilian joint agreement. *European Chemical News;* **37**: No. 1007, 34(16 Nov 1981).

Halcon SD of the US is reported to have signed an agreement with Oxiteno SA of Brazil to provide the Brazilian company with research support to produce base petrochemicals using ethanol from biomass as a feedstock. Brazil's "Pro-alcohol" programme intends that over 10 billion litres per year of ethanol will be produced in the country by 1985, 1-2 billion litres per year of ethanol will be available for use as a chemical feedstock. Although Oxiteno has exclusive rights to license the technology to third parties in Brazil, Halcon retains the right to license the technology worldwide, excluding Brazil, and intends to do so in developing countries which lack oil supplies but are rich in biomass sources.

5439 Solar pond as a possible source of solar energy: first results of experiments on a northern Italian farm. Riva, G. (Universita degli Studi di Milano, Italy). *Energy in Agriculture;* **1**: No. 1, 21-39(Nov 1981).

The report is divided into two parts. The first deals with operating principles and the main technologies of solar-pond construction on the basis of data obtained from the literature. The second part covers the experience gathered in 2 years of experimental work on a small solar pond (20 m^2, 0.8 m deep) installed at the experimental farm of the University of Milan. A saline gradient was obtained by diffusion of salt (NaCl) from the pond bottom. The maximum temperatures achieved were 55 to 60°C and the mean energy-harnessing efficiency was 10 to 20%. The major problems encountered concerned the need to maintain the transparency and efficiency of the saline gradient layer at optimum conditions. This study is part of a research project for the assessment of the practicability of solar-pond technologies under Northern Italian ambient conditions. The small pond is a preliminary to larger facilities (140 to 160 m^2) to be built into an existing farm. 15 references, 16 figures.

5440 Crop-residue supply for energy generation: a prototype application to midwestern USA grain farms. Apland, J. (Univ. of Minnesota, St. Paul); McCarl, B.A.; Baker, T.G. *Energy in Agriculture;* **1**: No. 1, 55-70(Nov 1981).

This analysis focuses on the dynamics of the production process, sequential decision making, and weather uncertainty as they affect the crop-residue-supply response of midwestern United States grain farms. Supply estimates for a typical grain farm are reported under varying harvest-season weather conditions. A supply response analysis for a hypothetical region suggests that crop-residue production would be quite price responsive and variable. The development of new harvest techniques and storage are identified as important to the economic viability of crop residues as energy resources. 11 references, 4 figures, 4 tables.

5441 Crop residues for energy: comparative costs and benefits for the farmer, the energy facility, and the public. Lockeretz, W. (Tufts Univ., Medford, MA). *Energy in Agriculture;* **1**: No. 1, 71-89(Nov 1981).

The costs of using crop residues for energy are classified according to whether they are cash or opportunity costs, direct or indirect consequences of residue use, incurred immediately or deferred over an extended period, and borne by the farmer or energy user as private entrepreneurs or by society as a whole. Estimates of some of these costs are given for maize residue in the North Central United States, including collection and transportation costs, nutrient losses, and erosion-related yield losses. Other costs, including loss of soil organic matter and off-site damage, are described qualitatively. The value of crop residues in ethanol production and as a power plant boiler fuel are estimated. This value is comparable to the immediate, direct costs of residue removal (collection and transportation). Therefore a farmer who chooses to sell residues at this price, without taking account of the remaining costs, is not receiving adequate compensation. In addition, such a transaction would entail further social costs. The need to reconcile soil-conservation incentives and subsidies for renewable energy is discussed in the light of this finding. 30 references, 4 tables.

5442 Performance warranties for residential and light commercial PV systems. Eisenstadt, M. *Solar Law Reporter;* **3**: No. 4, 607-608(Nov 1981).

Photovoltaic (PV) manufacturers are providing warranties for their products. These warranties are regulated by federal and state laws; however, it appears that most PV manufacturers are unaware of the applicable laws and are therefore exposing themselves to unintended liability as well as leaving their customers somewhat uncertain about their warranty rights. The requirements of warranties for PV systems are examined, and methods for economically verifying the performance of a PV system are discussed. A model warranty for PV manufacturers is included.

5443 Oil companies and photovoltaics: a potential monopoly. Wilcox, R.L. *Solar Law Reporter;* **3**: No. 4, 703-727(Nov 1981).

Oil companies are rapidly acquiring a huge share of the photovoltaics (PV) industry, causing concern by some solar advocates that PV ultimately might be controlled by large companies with no immediate incentive to develop the technology. A review of antitrust laws reveals they are only minimally applicable to a new field such as PV. Federal legislation preventing further oil company investments is not necessarily the best approach to keeping the PV industry healthy, financially as well as competitively. Instead, the government should encourage competition by providing financial assistance for small PV businesses.

5444 Ethanol plant. *Chemical Week;* **128**: No. 24, 25(17 Jun 1981).

It is reported that Alcogas' 400,000 gal/year ethanol plant at Ordway, Colorado has been put onstream. The plant can produce 190 proof ethanol from corn, milo, and watermelon which will then be refined to 200 proof and sold to petroleum distributors for use in gasohol.

5445 Brazil buys Soviet technology for ethanol. *Chemical Week;* **128**: No. 23, 29(10 Jun 1981).

Brazils Coalbra, which is 51% owned by the Brazilian government and 49% by private Brazilian companies, has signed technical cooperation agreements with two Soviet state companies for construction of a demonstration plant and 15 commercial units to produce alcohol from wood. This is the first step in a program for building 235 ethanol plants in Brazil by 1995.

5446 Technocracy versus reality: perceptions in solar policy. Sawyer, S.W. (Univ. of Maryland, College Park); Feldman, S.L. *Policy Sciences;* **13**: 459-472(1981).

The task of identifying federal solar policy and research priorities has been delegated consulting firms, university researchers, and technical laboratories. Solar-commercialization policies for the residential sector have been a major focus of these entities' efforts; yet, their research methodologies have generally ignored the advice and experience of homeowners who have installed solar domestic water and space-heating systems. The absence of such input raises the question of how accurately the research community has evaluated the impact of specific barriers and incentive policies to residential solar use. Three surveys compared the planning community's assessments of the barriers and incentives to those of homeowners who had personally experienced the entire solar purchase, installation, and operation sequence. Despite the potential for error, no major dichotomy was found to exist between the planning community's perceptions and those barriers and incentives actually extant.

5447 Straw as an energy source. *National Swedish Board for Technical Development Informs about Energy Technology;* No. 1, 8-10(1981).

The Swedish Academy of Engineers has studied the use of straw as an energy source and found problems in the areas of transport, supplies, and the need to design new boilers to meet the combustion properties of straw. The Academy recommends further investigations into the firing of pulverized and pelletized straw and modifications of bulk-fueled equipment for a straw-wood chips mixture. Sweden produces seven million tons annually, only half of which could be used for fuel purposes. 1 figures. (DCK)

5448 Model solar-access regulations. Achter, S. Cheyenne, WY; Wyoming Department of Economic Planning and Development (1981). 18p. Wyoming Department of Economic Planning and Development, Cheyenne.

The Planning Division of Wyoming's Department of Economic Planning and Development has prepared this model ordinance to aid communities in complying with the Solar Rights Act. Since the model is aimed at all local governments, with a variety of unique characteristics and philosophies, local governments need to modify the model to suit their individual needs, although they must still comply with the basic statutory requirements.

5449 Solar power generation. *Quarterly Energy Review - North America;* 23-28(1981).

The testing of distributed-collector-system (DCS) and central-receiver-system (CRS) thermal-solar power stations and experiments using photovoltaic cells for direct conversion, solar ponds, solar chimneys, and hybrids are gradually developing a role for solar energy as an alternative generating source. Several joint ventures involve DOE, utilities, and the private sector in pursuing this goal. Other research and development projects around the world illustrate a growing interest in large-scale plants as well as small units for remote areas. US and European solar companies are developing export markets for solar technology in more-suitable climates. (DCK)

5450 Alternative natural energy sources in building design. Davis, A.J.; Schubert, R.P. New York, NY; Van Nostrand Reinhold Company (1981). 287p. Van Nostrand Reinhold Company, 135 W. 50th Street, New York, NY 10020 $17.95.

This second edition updates and adds new developments in designs for energy conservation and renewable energy sources. Beginning with general relationships of energy to the built environment, the book proceeds to cover regional and site adaptation, energy conservation, natural cooling and ventilation, wind power, solar energy, organic fuels, and integrated systems. Alternative solutions and applications are described for each problem. Over 200 diagrams, tables, and formulas are supplied, along with 11 detailed appendices. 469 references.

5451 Encouraging home energy systems: by revising land-use regulations. Silver Spring, MD; Maryland-National Capital Park and Planning Commission (1981). 103p. Maryland-National Capital Park and Planning Commission, 8787 Georgia Avenue, Silver Spring, MD 20907.

A project to determine whether current laws governing residential use of property could be modified to permit developers and homeowners to meet their energy needs through solar power and other forms of energy production looked primarily at active and passive solar energy, but also included underground housing, wind power, home methane generation, and community energy systems. The scale of the technology studied was primarily for detached single residential units and, secondarily, clustered residential areas. The legal aspects examined include siting requirements, zoning ordinances, and subdivision regulations. The economic benefits of sample homes appear in the appendix. 37 references, 13 figures, 1 table.

5452 Forest biomass as a source of energy: a policy statement for New England. Young, H.E. (School of Forest Resources, Univ of Maine, 115 Nutline, Orono, ME 94473). *Northern Logger;* **28**: No. 4, 8-9, 44-46(1979).

The forests of New England can contribute significantly to the energy requirements of the region at the present time. Key elements of a policy governing use of biomass for energy are accurate biomass inventory methods; development of appropriate harvesting and transport equipment to handle tops, stump root systems, and small trees and shrubs; and education and communication on how to manage the land to produce energy materials as well as other products, how to harvest and store wood, and how to burn it efficiently; development of markets; adequate financial support for energy operations; increased forest production, and leadership to coordinate the development of wood biomass for energy programs. (Refs. 3).

CORPORATE AUTHOR INDEX

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Because of problems involved in the mechanical preparation of this index, all accent marks are omitted. Changes in spelling introduced as a result of accent omission follow standard conventions.

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The subject index is based on the use of subject descriptors selected from a controlled thesaurus of terms. Subject descriptors and qualifiers (subheadings) are selected and presented in the following format:

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Qualifier
Title, (supplementary information), citation number, (report number)

The title may be supplemented with additional words, or a phrase, if it appears additional information would be helpful. In cases for which the title contains little or no information related to the subject entry, it may be replaced entirely by the supplementary information. A qualifier is not always required, and in such cases the title will follow the unqualified subject descriptor.

The descriptors selected for use as subject terms are generally the names of specific materials, things, or processes. To the extent possible, a qualifier is selected to describe the properties of, or processses applied to, the subject term.

Index entries are selected to indicate the important ideas and concepts presented in a document, rather than words that may appear in the text. Within the available thesaurus terms, the most probable or logical place to look for typical information is selected. "See references" are included to guide users from synonymous terms or phrases to the descriptor selected as a subject heading for the concept. (e.g. Pipeline Quality Gas see HIGH BTU GAS). "See also references" are used to indicate where to find references to subject concepts that are narrower, broader, or related to a particular subject heading. To complete an exhaustive search of a given subject, all such headings should be reviewed.

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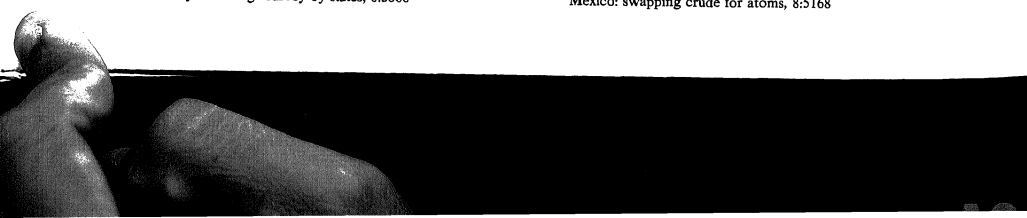

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REPORT NUMBER INDEX

The numbers assigned to all reports cited in the publication appear in the first column of the index. Cross reference information and/or availability are included as appropriate. Abbreviations used in the availability column are elaborated at the end of the index. To expedite the filling of orders for reports from NTIS and TIC, an order number in the form, DE82000001, appears in column 3. Requesters are urged to use this order number where provided. In column 4, one or more DOE distribution categories are indicated, e.g. , STD-10, MN-25. STD indicates distribution was made in full-size copy; MN indicates microcopy distribution. These category numbers are included to assist DOE librarians in responding to requests for reports in their collections. The UC (Unclassified Distribution Categories) are defined in DOE/TIC-4500, available from TIC. The citation numbers are given in column 5. NOTE: DOE attempts to disseminate its information as broadly as possible. Even though a report may contain some degree of illegibility, it is believed that the report may still make a contribution. The presence of a superscript (1, 2, or 3) following NTIS in the availability column denotes the extent to which a report may be illegible and the form in which it is available: (1) = 1 to 5% illegibility, available PC and MF; (2) = 6 to 10% illegibility, available MF only; (3) = 11% or more illegibility, available PC only.

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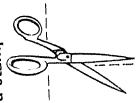

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