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ENERGY INFORMATION

A WORKSHOP ON CURRENT PROGRESS AND PROBLEMS

PREPARED FOR THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

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U.S. GOVERNMENT PRINTING OFFICE
61-749 O WASHINGTON : 1980

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ENERGY INFORMATION WORKSHOP

A Discussion of Current Progress and Problems in Energy Information

Held February 6, 1980

By the

Congressional Research Service
Library of Congress

Susan R. Abbasi
Analyst
Environment and Natural Resources Policy Division

April 22, 1980

LETTER OF SUBMITTAL

CONGRESSIONAL RESEARCH SERVICE,
THE LIBRARY OF CONGRESS,
April 28, 1980.

HON. ABRAHAM RIBICOFF,
Chairman, Committee on Governmental Affairs,
U.S. Senate,
Washington, D.C.

DEAR MR. CHAIRMAN: Energy policy and energy information have been the focus of intense interest in the Congress over the past decade, and Members of Congress have frequently requested the Congressional Research Service to assist them in obtaining energy information, assessing its accuracy and usefulness, and analyzing energy issues.

Accordingly, the Congressional Research Service sponsored a full-day Workshop on Energy Information, held on February 6, 1980, in the Whittal Pavillion. Over 40 leading professionals from throughout the energy information community and from the key congressional committees assembled to assess current progress and problems in energy information programs. These included the Administrator of the Energy Information Administration and his six assistant administrators, participants from other Federal data collection agencies, leading academic energy analysts, energy industry associations that deal in gathering and analyzing energy data, and interested congressional staff.

The accompanying report summarizes the workshop discussion, and provides an overview of the issues raised and conclusions reached. The issues discussed covered a wide range, including energy data collection issues such as credibility of energy data, designing an energy data collection system, timeliness and accuracy questions, and conflicts between regulatory data and statistical data collections. In the area of energy analysis and modeling, the issues discussed included defining analytical needs, problems and limitations in modeling, and the role of energy information analysis in the policy process.

This report will contribute to your request for a balanced assessment of problems relating to energy information by leading professionals throughout the communities that produce and deal with energy information. The high level of interest and enthusiasm of the participants in the workshop subjects is worth noting, demonstrating the importance of these issues in their eyes.

The workshop was planned and organized, and this summary report was written by Susan R. Abbasi, of the Environment and Natural Resources Policy Division. The assistance of Loren Cox, Executive Director of the Center for Energy Policy Research at the Massachusetts

Institute of Technology, who served as moderator of the workshop and adviser on its preparation, as well as assisting with editing the final report, is gratefully acknowledged. The assistance of Audrey Ingram in the typing of the report is also appreciated.

I am hopeful that the overview and analysis of energy information issues provided in this report will be of assistance to the committee and to the Congress as it continues its work in energy policy.

Sincerely,

GILBERT GUDE, *Director.*

MEMORANDUM OF THE CHAIRMAN

To Members of the Senate Committee on Governmental Affairs:

When this committee considered and reported the legislation which established the Department of Energy, one of the most important goals of that legislation was to provide a capability for obtaining and analyzing energy data and information on a broad, comprehensive, objective basis. In the 2½ years since the department began its operations, the Energy Information Administration, within the Department, has been charged with this important and massive task. As part of this committee's obligation to insure that the goals of the Department of Energy Organization Act are being met, this committee is now conducting oversight on several agencies within the Department. Among these is the Energy Information Administration.

This report summarizes a Workshop on Energy Information held by the Congressional Research Service on February 6, 1980, in which the progress and problems in energy information programs were discussed by an impressive array of professionals from the academic community, key Federal agencies, industry representatives, and congressional staff. The report serves as an important benchmark in providing an overview of the current status of energy information, assessing obstacles to improvements in areas where they are needed, and raising issues which remain unresolved. It provides an important perspective from which to pursue this committee's oversight of the Energy Information Administration, and meets our request for a balanced assessment of the important issues by the key professionals in the energy information field. In addition, this report contributes to an understanding of energy data and information issues, which will be of value to all Members of Congress as they deal with the crucial issues of energy policy.

ABE RIBICOFF, *Chairman.*

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Overview and Conclusions

ISSUES RAISED IN THE ENERGY INFORMATION WORKSHOP

The purpose of the Energy Information Workshop summarized in this report was to identify areas of progress, problem areas, and obstacles to achieving needed improvements in energy information.

The all-day workshop, sponsored by the Congressional Research Service, was held February 6, 1980, in the Whittal Pavilion at the Library of Congress. It was designed to bring together key professionals in energy data collection and analysis from the academic community, top administrators of the Energy Information Administration and other data collection agencies, government and private sector analysts, and users of energy information in the key congressional committees. The objective was to achieve a spontaneous dialogue on several key questions under four general topics: (1) energy data collection, (2) assuring data quality, (3) energy analysis and modeling, and (4) energy analysis and the policy process. The questions to be covered under each topic were listed on the agenda (see Appendix A). No formal papers were prepared for the workshop. Several initial speakers opened each session with informal comments, and these are provided in Appendix C.

It should be noted that although the focus of the workshop was on the over-all issues of energy information, the Energy Information Administration (EIA) became the focus of a good deal of the discussion. Because of the central role of the EIA, the attention of participants turned inevitably to its activities, but the intent was not to scrutinize the agency as such; rather it was to discuss the most current activities in these areas, and to identify related problems.

BACKGROUND

The central importance of data and information in the energy policy process is seldom disputed. Obtaining credible, useful energy data and analyses is a continuing, yet sometimes elusive, goal for Congress. Underlying this search are some fundamental dilemmas and unspoken assumptions.

All users of energy data and information, whether policy staff in the executive branch, members of Congress and their staffs, or the analyst in the academic community, have their own expectations about what kind of information is needed—what kinds of data should be collected, and what kinds of analysis should be done to achieve a better fundamental understanding, and to support formulation of effective policies. To each of these users these needs seem obvious. But to the agencies and staff charged with meeting these diverse and demanding expectations, these needs and priorities may not be obvious at all, may compete for scarce time and resources, or may not be as simple as the potential user believes.

One underlying expectation within the Government, present throughout the early years of the U.S. energy crisis, following the Arab oil embargo of 1973, was that the key ingredient needed for effective energy policy was better energy information. When the Energy Information Administration (EIA) was established in 1977, Congress sought to centralize responsibility for the collection of all important energy information, give the agency independence from the policy process so that it would not be compromised (as its immediate predecessor agency, the Federal Energy Administration, was thought to have been), and to give it the analytic capability to make forecasts and answer key analytical questions. An unspoken assumption was that when EIA had marshalled the required facts, the necessary energy policies would almost automatically be revealed, and would spring forth with broad support, since they would be based on accurate, objective analysis.

This expectation, and the magnitude of the task given to EIA, have added considerably to the dissatisfaction with the state of energy information generally, and concerns about EIA's effectiveness. Indeed, the single task of marshalling the facts has proven to be a lengthier, more difficult task than the framers of EIA's mandate had foreseen. The difficulty of reaching national consensus on a comprehensive energy policy, together with the assumption that a prerequisite for it would be accurate, good information, has made energy information the focus of even more demanding expectations and criticisms. As one workshop participant pointed out, policymakers who do not get information that meets their needs tend to press for still more detail, and different forms of presentation—seeking that perfect formula that will make answers easier and justify policies.

A related problem, as one participant from EIA pointed out, is that energy information producers are implicitly asked by decisionmakers to be the "uncertainty absorbers"—a role which belongs inherently to the policymaker. "The future is always uncertain, no getting around it. And the effects of policy choices are always to some degree uncertain. The policymaker would like to avoid the very unfortunate situation of having to make decisions not knowing precisely what's going to happen." And so, policymakers continually look for information that will relieve them of the uncertainty factors in their decisions. This is likely to be a source of continuing tension between the decisionmaking process and those who produce energy information, as will the inability of information, per se, to prescribe policy and resolve value differences.

THE CURRENT SITUATION

During the course of the workshop, some general conclusions about the current system seemed to emerge, along with several unresolved issues.

First, congressional information seekers appear to have a very different emphasis and approach to energy information than do the energy data and analysis professionals. The professional community sees considerable progress toward developing a solid energy data base. They also recognize and must deal with a wide variety of difficult technical problems that make the gathering and analysis of energy data slower and less precise than energy policymakers would like. On the other hand, the policy-oriented participants emphasized the need

for faster and more reliable responses, and seem to have relatively little awareness of, or concern about, the technical problems. This divergence seems to indicate the likelihood of continuing tensions between these groups, although communication and increased understanding by each side of the others' problems is growing, albeit slowly.

Another source of problems between the two groups is that policymakers frequently need projections and forecasts of the future, whereas the data on which these projections must be based come from the past. At present, energy conditions are changing so rapidly that past data can be only an uncertain and often unreliable indication of future trends.

Several generalizations concerning the existing energy information programs were articulated:

(1) The current structure for data collection has been shaped more by "emergency-of the day" crises, than by conscious and purposeful design. The statutory authorities of EIA are more than adequate, and at present, likely go somewhat beyond the capabilities of the programs in place. The system lacks an emphasis on anticipating upcoming problems, beyond the heavy current emphasis on petroleum.

Problems in identifying data needs were cited. It was observed that data collection efforts in several areas are currently subject to serious problems. Among these is the lack of comparability of energy data with other economic data, which prevents integration of energy with other factors, such as the national income and product accounts, and hinders broad economic and energy trend analysis. This is due largely to statutory requirements which prevent EIA from using collection information of other Federal data agencies—a problem discussed at length by workshop participants. Other problem areas include weaknesses in demand data generally; and some specific difficulties in getting accurate supply data.

(2) Credibility and quality of data are continuing problems. The necessity to obtain most data directly from energy industries causes suspicion in public perceptions of the accuracy of energy information. The data professionals make an important distinction between validation, and verification. Validation involves evaluation of the data collection instruments, such as survey questionnaires, evaluation of statistical assumptions, assessment of respondents' understanding of the definition and forms, clarity of definitions used, etc. Verification, on the other hand, involves the specific checking of data already collected, through company audits, or by such means as physically re-checking numbers collected to assure their accuracy. It is clear in the minds of the data collection professionals that the process of evaluation which is done under validation is more important than verification in assuring reliable, accurate data. As a result, EIA has assigned a relatively low priority to vertification activities. However, in the opinion of the congressional participants, a higher priority for verification—the actual checking of numbers—is needed, in order to establish the credibility of energy information.

(3) The processes of energy analysis—particularly modeling—have contributed both to understanding and confusion. Better understanding has resulted from analytic work, but confusion among information users has resulted from failures to perceive the limitations of how such work should be applied. Much of the dissatisfaction and criticism of energy information seems to be based on misunderstanding—failure to

understand the limitations of a given model or analysis—and poor communication. The fact that a model does not necessarily provide specific, precise answers, but rather a range of possibilities, needs to be better understood by users of modeling results. This understanding can be assisted by improved explanations by modeling analysts. One of the most valuable results of a modeling exercise is the learning process in building and using the model—identifying essential variables, finding weaknesses in the data, and thinking through the important relationships. If a model is properly explained and used, this learning process can be transmitted to the user.

The workshop discussion gave evidence of progress toward better understanding and trust in several areas. Some energy information users in Congress, while continuing to push for maximum precision and speed, acknowledged that there is a need to recognize the limitations of any given analysis or data series, and expressed willingness to increase their understanding of necessary qualifiers and differing viewpoints. The energy analysts expressed the need to interact more with the policy makers in order to better understand their needs—and more willingness to do potentially controversial analyses if the user of the resulting information would be willing to take the trouble to understand what its limitations are.

MAJOR ISSUES RAISED IN THE WORKSHOP

Several unresolved issues emerged as the focus of a good deal of discussion, and were viewed as potential obstacles to the achievement of reasonable energy information goals.

Should regulatory data collection and statistical data functions be separated?

Currently, EIA devotes a large proportion of its resources to its mandate to collect data for the regulatory operations of the Department of Energy. EIA's statistical data and analysis functions are carried out under a mandate to gather information on operations in energy supply and demand systems, analyze short and long-term trends, make forecasts, and answer questions about impacts of policy options. Considerable discussion turned on the problems caused by attempting to have one organization collect both types of data. It was pointed out that the objectives of the two types of data gathering are inherently different: in regulatory data, the objective is to obtain information about each actor in a given industry or operation, in order to monitor compliance with regulations. In the case of statistical data, the objective is to gather detailed data on a representative sample in order to understand trends, and what is happening in general. A key ingredient in the latter is a candid response from a respondent who does not worry about revealing confidential information.

It was noted by several speakers that the statistical goals are subordinated to regulatory data goals in the current system. This system was established by Congress to enhance enforcement capabilities for regulatory agencies, and therefore requires disclosure of all data in EIA's possession to the regulatory agencies in DOE. The result is a system that possibly compromises the statistical goals, because confidentiality can not be assured to respondents to EIA surveys. Yet the

statistical data are the basis for some of EIA's most visible activities—those which analyze trends, produce forecasts and projections, and publish data series.

Combining the two types of data collection in the same agency has some advantages, however, according to other speakers. Among these was the potential for lessening the burden on energy companies by combining the questions asked for the two purposes in one form and coordinating them, in order to reduce duplication.

Should the disclosure requirement for EIA be changed in order to assure confidentiality to those who provide statistical data?

The question was raised whether, if the two types of data collection are kept in the same agency, the authority which requires EIA to disclose data in its possession to regulatory bodies could be altered to provide confidentiality for statistical data collection that would be comparable to the safeguards offered by other data gathering agencies, such as the Bureau of Labor Statistics, the Census Bureau, and others.

Several speakers pointed out that EIA suffers significant penalties due to its current disclosure requirement. It is kept out of the mainstream of the Federal statistical establishment, which means it cannot obtain information and data from the other data collection agencies. A real cost involved in this is that the lists of industries or other entities—the "universe" of any given type of operation or region—that have been developed and tested over the years by these other agencies cannot be used by EIA, since these lists are guaranteed by law to be confidential, and once in EIA's possession, this safeguard against disclosure would be lost. Thus EIA must "re-invent" these lists, which means an expensive duplicative effort. It also means EIA lists will not match those of the other agencies gathering economic and other types of data. A real cost of this mismatch is that the energy data cannot then be compared and integrated into broad economic analyses and other trend analysis.

Obtaining candid responses and a high response rate to voluntary data programs also becomes a problem for EIA. However, complete disclosure of all data in EIA's possession was seen to be a continuing need by those whose interest was in assuring that antitrust and other regulatory procedures would not be hindered. This is especially important in energy, it was contended, because lack of availability of data sources would also exacerbate the public suspicion that energy industries cannot be trusted to give honest responses.

Should the energy analysis and modeling functions be altered, or moved closer to the policy function?

Because the predecessor of EIA—the Federal Energy Administration—had suffered from widespread suspicion that the analysis of energy data done in that agency (in the years 1974–1977) had been biased and heavily influenced by the policy formulation process, the framers of EIA's mandate separated its analysis functions from the Energy Department's policy operations. This separation has resulted in relative isolation of EIA from the policy process, and often, neglect of its capabilities. The independence of EIA from the rest of DOE, and the insistence on exhaustive quality review processes within EIA, have also resulted in a system that is sometimes ponderously slow in producing energy analysis. Workshop participants from EIA, else-

where in DOE, and those from outside DOE agreed that EIA was not used in the policy process as much as had been generally expected, and that the agency was too slow in responding.

The point was argued that good energy analysts, sensitive to policy needs, are not likely to stay in a system where they are neglected; they will tend to leave the agency. EIA staff stated that their analysis was most stimulating and most productive when done in close association with the user—the policymaker who needed it. They expressed regret that this did not occur more often.

It was suggested that the analysis function should perhaps be located organizationally where the policy formulation is done. Others disputed this solution, however, indicating that the dangers of "capture" by the policy process have not abated; that if analysis is too close to policy, it will respond increasingly to the crisis of the moment, and seek approval from the policymakers.

A related question is whether some kinds of analysis, such as short-term, fast turn-around analysis, should be shifted into closer proximity to the policy staff in DOE in order to be more responsive, with the long-term trend analysis remaining in EIA. No clear distinctions were defined during the discussion, however.

Although the workshop participants raised some questions about EIA's analysis function and whether this function should be moved, the question of where the analysis resided was considered less relevant than the necessity of keeping the lines of communication vital between the policy and analysis people. Another concern was that possible controversies involved in energy analysis efforts should not compromise EIA's essential tasks in gathering and assuring the quality of basic data.

It was also pointed out that modeling activities often contribute to determining basic data requirements, and this interaction would suffer if data and analysis activities were organizationally divorced.

A participant from the DOE Policy and Evaluation Office noted that there is a tendency to use energy information and analysis as a scapegoat for unpopular policies when the analysis is not part of the policy process. If policy staff were responsible for the analysis, this would be less likely, he indicated. EIA has little incentive in the current system to be responsive—if the policy is poorly received, the analysis may be blamed, and therefore an exhaustive and ponderous review system guards against such dangers. In addition, there has been some reluctance of EIA to do analysis in controversial areas.

Despite dissatisfactions with the current system voiced by many participants, some progress was indicated in a growing trust on the part of some analysts and users that they could work together. Examples of such collaboration were cited by EIA participants. This involves developing a willingness of the user to thoroughly understand the limits on precision and the qualifiers in the analysis, so that too much is not expected from it, and also developing a willingness of the analyst to do work quickly, if he can trust the user not to use him as a scapegoat for an unpopular or ineffective policy.

In the remainder of this report, in the Workshop Summary, discussion by participants on which the foregoing conclusions and issues are based is presented in more detail.

Workshop Summary

The workshop discussion is summarized under two major categories: energy data collection issues, which were the subject of the morning sessions, and issues related to energy analysis, modeling and the policy process, which were discussed in the afternoon.

Morning Sessions

ENERGY DATA COLLECTION

In discussing the issues involved in assuring good basic energy data, certain distinctions were made: first, there is a need for a well-designed data collection system, based on sound sampling an instrument techniques; there must be a competent and acceptable verification process; there must be adequate resources available for carrying out the above within a reasonable time frame; the system must meet the very diverse needs of energy information users in Congress and elsewhere—from very specific details about energy impacts in a particular congressional district or sector, to the global picture and general price and supply trends; and there should be a method of clearly reporting these data in forms useful to a wide range of these users, from researchers to the general public.

There was extensive discussion of how the Energy Information Administration arrived where it is now. It was pointed out that interest in gathering energy data was intensified in the early 1970s with the emergence of the energy crisis. The mandate given to EIA's predecessor agenices, which still remains, was to collect accurate statistical information about the large questions of supply and demand, as well as to collect detailed, "micro" data upon which various regulatory decisions would be made.

The mandate which linked the regulatory data and basic statistical data gathering was viewed as a basic problem throughout the workshop discussion.

This report first summarizes discussion of issues connected with data gathering, and then turns to the discussion of the regulatory/statistical data conflicts.

I. Designing a good energy data collection system

There was wide agreement that the Government and the public need first, a solid base of energy data and information, consistent over time, that can be trusted to be accurate and reliable. The Department of Energy Organization Act characterizes the Federal Government's needs for energy information, charging EIA with:

> Carrying out a central, comprehensive and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy resource reserves, energy production, demand, and technology, and related economic and statistical information, or

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which is relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs.[1]

The difficulty of complying with such a broad mandate was acknowledged by most participants. As a speaker from the Bureau of Labor Statistics put it, the design of a system to meet this definition of energy needs could be likened to a process that took several decades when the national income concept and its ramifications were developed:

If one carefully reviews the mandate of EIA, I would say that their mandate is to greatly expand the data base on energy, to define the concepts to do that, to validate its accuracy, to analyze and forecast the changing values of this data, and to do it all immediately . . . And I think therein lies a lot of the conflict over energy data and our expectations from it.

After acknowledging the difficulty of the mandate, participants moved into the discussion of the importance of a strong data base and how to design it. Impatience with long response time, discussed below under "timeliness" issues, could be mitigated if this strong data base is well developed, according to Albert Linden, Assistant Administrator of EIA. In fact, in order to make a fast, spontaneous response to energy questions, he indicated:

You need to have a very solid base, i.e., a solid monthly base or a quarterly base of information, and then work from that to do imputation . . . I think we need to concentrate on that, to build initially that solid base. Until you have that and can understand what's transpiring here, to go out and do things in a hurry leads you into some of the problems that we've had in the past.

One of the most important elements in assuring useful, accurate energy data is the basic design of the collection system. This was seen by the professionals from EIA and other data agencies at the workshop as a primary concern—and much more important than verification of numbers already collected in assuring the quality of the data that are collected.

The design and implementation of a good data collection system was viewed as a difficult challenge, fraught with numerous problems and pitfalls. This issue was discussed primarily by the data producing professionals; The recognition of these difficulties and obstacles to collection of reliable, accurate information is sometimes lacking on the part of many information users. One ramification of this can be a lack of awareness among information users of some of the uncertainties and gaps upon which energy analysis and "answers" sometimes must rest.

Workshop participants agreed on areas of progress where current crises have forced emphasis, such as in collecting petroleum statistics (although improvement still was seen to be needed). However, in planning ahead to gather data in less crisis-prone areas so that problems and solutions can be anticipated, the system needs better design.

Charles Smith, Assistant Administrator of EIA for Energy Information Validation, described the problems involved in designing a good data system, and the importance this has for assuring the quality of the data:

We've found that the real problems we see in data quality come from the difficulty of, first, clearly identifying the real needs for data; second, defining the terms and phrasing questions that respondents can answer, using data that

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[1] Sec. 205(a)(2) of Public Law 95–91. See Appendix D, "Energy Information: Major Requirements in Law" for the major statutory mandates assigned to EIA.

they have, so that they actually address the questions we are trying to answer; third, isolating and identifying the correct respondent population; and fourth, in identifying the errors that we induce as we process and aggregate the data. Now these problems relate to the design and operation of the data collection. We've found that better design of our collection instruments and improved frames [2] contribute far more to data improvement than does company audit.

He went on to say,

It should be noted that the principal causes of errors we found were not intentional misreporting. There were problems with the frame lists of oil and gas operators in some of the less important petroleum-producing states. And there were problems with understanding certain definitions.

The incorporation of an effective validation process was viewed as an essential element in the design of a good data collection system. An important distinction is made between validation and verification. Validation covers the evaluation of the data collection instruments, evaluation of statistical assumptions, and the samples used, assessment of the respondents' understanding of forms and the clarity of definitions used, and comparison of data actually collected to estimates and expected results from other sources. The validation system is designed to assure regular, systematic assessment and evaluation of the accuracy of data being collected; identification of problems suggests the need for remedies to weaknesses in the collection system. Verification, on the other hand, is a narrower term, and involves the checking of numbers already collected. This can be done by measures such as company audits, or physically re-checking representative samples of the data collected to assure their accuracy. The role of verification is discussed below under "Credibility" issues. The design of the data system, including an effective validation program, speakers indicated, requires a staff that would include engineers, geologists, psychologists, and especially statisticians.

Barbara Bailar, Associate Director of the Census Bureau for Statistical Standards and Methodology, and a member of the PART [3] team for EIA, agreed on the primary importance of proper design of a collection system—particularly the specific design of the survey or collection instrument. She cited examples arising from her work in evaluating EIA data collection projects.

Right at the very beginning of almost every evaluation, there is an effort to find a clear statement of survey objectives. Sometimes [in EIA activities] there is an obvious ambiguity concerning the purposes of the collection system. Where that ambiguity exists, you're going to find troubles all along the way.

Dr. Bailar indicated the specific importance of the questionnaire used to collect data:

There's always difficulty about translating concepts into operational definitions. One of these, for example, was that in one survey the definition of a petroleum refinery was very difficult to apply, and people were using it in different ways. We have found at the Bureau of the Census that there is a great need for pretesting these definitions and questions. This has been very enlightening to us. The wording, the order of the question, all of these things have to be looked at.

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[2] "Frames" are the lists used in determining which companies, individuals, or other entities will be surveyed in any given category of operations or geographical region.

[3] PART is the Professional Audit Review Team, established by Public Law 94–385 specifically to review EIA activities, and report annually on progress and problems in achieving its goals. It consists of a representative from each of six agencies, including the General Accounting Office (Chairman), the Securities and Exchange Commission, the Bureau of Labor Statistics, the Federal Trade Commission, the Bureau of the Census, and the Council of Economic Advisers.

Another issue raised by several participants was the importance of educating the respondents about the purposes of the survey and getting their cooperation in meeting the agency's goals. An evaluation of a survey which includes contacts with respondents can be:

> . . . a chance to educate respondents. Your respondents will open up to you, because they think they're helping you, that you aren't just there to investigate them. There's a tremendous amount that can go back and forth in educating the respondents on what you want to get out of the survey. You can see changes occurring in the kinds of reports that you're getting from the respondents.

Involvement of the users of energy data in order to determine exactly what their needs are is also an important part of the design of a data system.

On the question of reliance on industry data, or data from the trade associations, several speakers indicated that there is really no alternative to collecting the data from the industry, and expressed confidence that appropriate design of survey instruments would circumvent problems with accurate data being collected. These comments are discussed below under "credibility" issues. A participant from the American Petroleum Institute said he thought the EIA data would include a higher reporting percentage, because the survey is on a mandatory basis, rather than a voluntary program such as the one in use by API. The API data on petroleum supply and demand were formerly the source of weekly and monthly EIA reports, but EIA now has substituted data from its own surveys, except in the case of imports.

In general, obtaining a substantial response to voluntary reporting of data was viewed an an important goal, and one that is not easy to achieve. In data collection efforts which do not include the authority for the agency to require by law a response from those being surveyed, the design of a clearly understood, and not unduly burdensome set of questions is particularly important in getting a high proportion of respondents.

Problems in the design of the data-gathering system.—Problems in the design of the energy data system were discussed, focusing mainly on the limits to the level of detail that could be obtained given the funding and other resources available, problems with designing any system to answer some kinds of questions, the lack of energy data designed for integration into broader economic analysis, and the major tendency to respond to crises and emergencies that divert resources from building the basic system.

A basic problem with the responsiveness of the current system is linked to the history of the system, according to EIA spokesmen. The data requirements in the period before 1973 were for accounting systems designed to give "fourth decimal place" accuracy for purposes of long-term trend analysis and research. Answers to rapidly changing questions was not one of the objectives of that system, when the situation was basically more stable.

The level of detail that the system should be reporting was questioned by some participants. As one congressional staff participant said:

> I just have the sense that we sometimes get mesmerized by detail. And we demand information to four decimal points where we don't really need that. It's very difficult to generalize, and in some cases of course, you really do need much better information. I just worry about this fixation that we have and we may

have induced on EIA to be correct way past the point at which any reasonable policymaker requires. A question that ought to be asked, and very often isn't is: "Does it really matter, anyway?" Often the Congress asks for a great deal of detail about factors which are really not at all important in terms of national policy. I have the sense that a perfectly adequate response for EIA to some of these inquiries—even to my committee—would be, "Look, we can get you that information, but it's probably going to increase the costs of this data base by one or two orders of magnitude. Do you really want it?"

A participant from the U.S. Geological Survey reiterated the costs of detail:

As you increase the amount of detail in the data, you drastically drive up the cost of collecting it, and drastically reduce the value of the data, because you can only use really detailed data to answer really trivial questions. Trivial questions are important to Congressmen in answering their constituents' questions. But recently there have been questions about how well we can live without Persian Gulf oil. It doesn't seem to me that the information that EIA is collecting is of much use in answering that question.

A limitation on the current system's capacity to measure gasoline demand involves the problem of the high costs of mounting an extremely complex monitoring system to answer some of the questions asked about gasoline shortages.

According to a senior analyst from CRS:

We monitor the system by checking inventory. The inventories are a very, very weak proxy for what is going out of the pumps at the gasoline station. So we have a problem of inventory measurement through stocks, when we are really interested in the dynamics of the system flow.

He suggested that the very complicated and expensive system that would be required to answer such a systems question may mean that some of the answers about gasoline may have to remain unanswered.

This conclusion was disputed however, by those speakers who indicated that some kind of measurement of the gasoline supply and demand situation is required in the current policy context. The requirement suggested to meet the problem raised above is to recognize the data collection system's deficiencies and clearly state them as qualifications of any figures that are produced.

Another significant drawback in the present system, according to several participants, is the absence of the capability to integrate energy data with economic and other data. One major reason for this is that EIA's mandate to collect both regulatory and statistical data—and to share both with regulatory bodies—has resulted in keeping the agency out of the mainstream of Federal data collection efforts. Thus, energy data cannot easily be integrated with these data to reach conclusions about the role of energy in broad social and economic issues. According to David Wood of MIT:

We are on the verge, I think, of facing the long-term prospect of energy data, no matter how well collected, verified, and presented, which is fundamentally unintegrable with the rest of the Federal statistics. Because it's drawn from populations—sample frames—which are not the same, we are always going to have these bridging problems between energy data and the other data.

As a result, several speakers noted, the historical role of energy and its current relationship to other factors affecting national measures of productivity, income and others cannot be assessed.

Another major problem—achieving a well-rounded, anticipatory energy data system—according to Jimmie Petersen, Assistant Administrator for Energy Data Operations, is that an "emergency-of-the-

day" syndrome dictates a large proportion of energy data collection responses. Beginning with the 1973 Arab oil embargo, emphasis has been on petroleum by necessity, and this has resulted in neglect of other important areas of concern.

> Much of the current problem continues to evolve around petroleum, whether it is with imports, domestically crude production, refinery production of heating oil or gasoline, product prices, refiner-distributor-retail margins, or any other facet of the petroleum industry. There are, however, a number of other energy sources which could be better understood if we were to take the time now to examine them, and plan for the time in the future when we will need the reliable information necessary to address the questions which will occur at that time.
>
> We in the government are still trapped, however, by the emergency-of-the-day syndrome. It's only through a conscious effort on our part to direct or redirect resources away from that entrapment that we will be able better to understand the questions, and hopefully provide some answers, in a timely and credible manner in the future.

In expressing the congressional view, a staff member from the House Budget Committee, described the past year as an anomaly, but pointed out the usefulness of "some kind of function at EIA or DOE that would try to determine in advance what kind of needs are coming up." The lack of such a mechanism was perceived by EIA and by data users as a significant gap.

II. Credibility of energy data

Linked closely to good design of an energy data collection system was the question of assuring the credibility of energy information—in the minds of policy makers and other users, and in public opinion. The role of verification in order to substantiate the accuracy of the data, problems in public opinion with using information supplied by the petroleum industry, and the need for better explanation of inconsistencies and anomalies were the main topics linked to credibility.

Participants in the CRS workshop were in agreement on the importance of a good validation program; the relatively low priority assigned to verification by EIA, however, was viewed as somewhat inappropriate in the opinion of some energy data users, especially those in Congress, in view of the importance it may have in reassuring public opinion that figures obtained basically from industry sources have been checked, audited, and thereby verified.

Giving the EIA view, Charles Smith indicated:

> Classical verification and auditing is probably the least important thing that we do. We've found that better design of our collection instruments and improved frames contribute far more to data improvement than does company audit. In fact, we find a shocking tendency on the part of our respondents to be honest even when it's to their own disadvantage. Of course, verification is needed, but verification can be very usefully done even for regulatory collections, on a careful statistical basis with sampling.

A speaker from the Census Bureau ageed with this view:

> The importance of verification is more in the evaluation of the process as a statistical function—you're much more likely to find problems here that affect the data than when you actually start looking at it in an accounting way.

Mr. Smith indicated that using a probability sample for estimates, the EIA has independently estimated and confirmed the figures collected in its oil and gas survey up to 41 percent of U.S. crude oil reserves, and 30 percent of U.S. natural gas reserves. He noted, "the

principal errors we found were not intentional misreporting. They were problems with the frame list of oil and gas operators" or with understanding of definitions.

However, congressional staff participants emphasized that verification was essential to the credibility of the data system.

Michael Woo, of the House Energy and Power Subcommittee, referred to problems that had plagued the validation effort at EIA (which encompasses verification), and made suggestions for tightening the validation system and focusing on the importance of verification:

Last year, during authorization of EIA's budget, it became quite clear that the effort was not measuring up to the goal. Problems inherent in the startup of the validation effort, and the exponential growth of the organization, caused problems of quality in the administration of validation, which I hope will be corrected.

I have two suggestions· One, I think each system should go through a general evaluation of its mandate, and come up with a clear enunciation of the problem in each system, in terms of its accuracy and its usefulness.

My second recommendation addresses the question of the problem of using industry data, etc. You need to assure some credibility, and I think this is where you need the verification and audits that Charles (Smith) was talking about. It doesn't have to be done on a full basis, but it needs to be done on an on-going basis.

Ronald Kutscher of BLS agreed with this necessity, and pointed out the expenses involved:

I think verification and validation are absolutely essential over time to create a perception in the public's mind that you are developing accurate data. Often times you can get valid data from trade associations, but the public perceives it as not a valid way to collect it.

He pointed out that BLS has a staff of some 600 personnel who do audits, and in some cases, more experienced agents go to a sample of companies and re-collect the data to check on the system. In another case, companies are asked to supply the same data a second time in order to see if the data are reproducible. "These are very costly programs. These are the kinds of programs that firms are not enthusiastic about doing," he said.

Lincoln Moses stated the difficulty of doing such verification for regulatory data. This is an example of the differences between regulatory and statistical data, and it was generally agreed that verification for regulatory data entailed very different problems than those for statistical data.

Dealing with oil company data.—The inherent suspicion in the public's minds with respect to data collected by asking oil companies for information is a constant theme in the credibility problems that have plagued energy information. Lincoln Moses announced that the current weekly petroleum situation report from EIA was the first issue that did not use API statistics except on imports.

All production figures, all stock figures, are based directly on responses from individual respondents in the industry and we are not getting secondary data . . . This is simply a response to a widely felt demand that the government should not be depending on a trade association for data. Sometimes people feel, well, there will never be good energy data because they just get the information from the petroleum companies. Now, we have thought of obtaining it from restaurants,

hotels, libraries, but we don't think we have the authority, so we're just going to stick with the only really good source of information that we can find.

Ronald Kutscher suggested that there is an education function involved, in which a better explanation of how information is obtained, validated and verified would create an understanding in the public's mind of why it is necessary to get data from oil companies. "The public feels the energy industry is doing them wrong. I don't view that as much as a measurement problem as an education problem." To deal with this suspicion of the figures it is necessary to do verification, several participants agreed.

Anomalies—Dealing with inconsistencies.—Another problem among the most damaging to the credibility of energy information has been the appearance of inconsistency, in which one figure is published, followed by changes and different interpretations weeks or months later. Lincoln Moses agreed that problems in this area have plagued EIA, and said:

Our failure is one of not devoting careful systematic attention to the task of imputing [making] a good estimate in the first place. Very primitive ways of coming up with the initial number have been inherited from our predecessors, and we have only taken a grip on this problem in one or two of our energy data series. But I want you to know that is moving forward. Now the typical user doesn't realize how we have blundered by not making good estimates from the data. He feels these data are terrible, and they keep changing; somebody must be lying. They ask why don't we get these figures verified. We don't need to get them verified, for that purpose. We need to get them better imputed.

Another solution to this problem was offered by other speakers, who suggested that clarification of exactly why figures are changed, or why they differ from each other, can help reconcile the differences, in the mind of the user. One energy analyst recalled an attempt to determine the natural gas consumption of the U.S. in which there were three numbers for the figure, and they differed by about 20 percent. The method used to resolve the difference was to go to the source and identify the variables that created the difference. Some measures included different kinds of sales by producers, whereas some measured wellhead production. These differences needed to be explained, he said:

No wonder there were three numbers. Once we published an explanation of what those three numbers were, and they all had a useful purpose, the problem went away. None of the agencies went back as liars, and none of the agencies had to re-do their numbers. They all had different numbers for reasons that could be understood. I think for credibility we have got to include clarification in there.

An important factor in credibility was generally agreed to be good interpretation of what the data mean, an issue more fully discussed in the following section below. Jimmie Petersen of EIA stated:

Even if you have the best data in the world, there gets to be a lot of judgement in how you interpret it. Whether you have perfect data or not, even validated data, you're into the world of judgement.

Another problem arises when the data are strained to provide a particular conclusion. "You hurt credibility when you strain the data or the analysis to arrive at a conclusion. We should more often say so when there isn't any data or any analysis to offer a judgement," one speaker noted.

Summing up the infectious nature of problems with credibility, a congressional staff member commented:

Some of the problem may be in data, and some may be in the analysis. But if you lose credibility in just one place, you lose it in the other. Once you lose credibility, wherever you lose it, it's gone. How do you get it back?

III. Timeliness and accuracy: The need for quick response and clear interpretation

Congressional staff attending the workshop agreed that their two over-riding concerns in energy data were for a quick response and a clear explanation of on-going energy problems. Michael Telson of the House Budget Committee pointed out that the needs of Congressmen are very different than the kinds being discussed by professionals in energy data. "We have found that there is a big gap of being able to translate from one set to another."

Dr. Telson gave examples of the need for a more timely response *with* a clearer explanation of that response:

(1) In the June 1979 shortages of gasoline, energy data showed that oil imports were actually higher than in the previous year. No satisfactory explanation of what the variables were that might be causing this discrepancy was made available.

(2) Over the summer of 1979, there was a need to know the week-to-week figures on distillate inventories in order to know whether heating oil inventories would be sufficient for the winter. If shortages seemed likely to occur, indicated by growth rates of inventories over the summer, then policy implications might point to re-imposition of distillate price controls. Such inventory figures were not available on a timely enough basis. Trends were what was sought, not complete accuracy.

(3) When the hostages were taken in Iran last November, there was a need to know where oil supplies would come from in the event exports from Iran were cut off. The relevant figures could not be made available on a quick-turn-around basis.

These were questions that Dr. Telson characterized as those which required a "simple answer", and which his staff has had to do their own interpretation in order to provide a concise explanation for use of Congress.

Jimmie Peterson agreed with Dr. Telson on the need for timeliness in responding to questions about changing situations, but replied that the questions are simple to ask, but can be very complex to answer. The tension between giving an accurate answer and a quick one becomes a problem when the very complex industrial, economic, and now political variables involved in the petroleum market come into play.

One problem connected with attempts to get a "quick and dirty" response in order to reply really quickly arises when people are pressed to respond quickly over the telephone, a Census Bureau participant noted, "One of the evaluations we did at the Census Bureau found out that when you press people to give you answers in a quick way, that the early reporting on those data may not be as good as the data that you get when people have had a chance to review their books and give you those figures."

As the discussion progressed, congressional spokesmen insisted upon the need for an answer, even if it is incomplete or preliminary. There is also the need to clearly articulate the limitations of the numbers being provided, and indicate which are the variables that influence it. The EIA spokesmen indicated that pressure for timely answers was

influencing them to try and respond more quickly, despite the fact that they had been burned by responding too fast, and later being scolded for changing the numbers as up-dated data became available.

Another congressional staff participant summed it up this way:

> The primary reason that EIA got all this attention was that policymakers on Capitol Hill did not feel they were getting information that was understandable to them. It doesn't mean the information wasn't available, it means that the information that they needed very quickly—there is always a sense of urgency about energy legislation—was simply not available in a way that they could understand. I think, in listening to this discussion, it has become fairly obvious to me, as it has not been obvious to me over the past years, that people who deal with these kinds of numbers don't understand how members of Congress can easily use this information, and how they want it.
>
> There is a growing number of members who deal with energy policy of varying sorts on a day-to-day basis, and they are very sophisticated about energy issues. What they don't get when they ask for numbers is any understanding of how these answers relate to political considerations, or social considerations. So they keep asking for more information, arranged in different ways, trying to find that right formula, that right way that they can get practical information expressed in a way that they can translate it more easily into policy. The link they are looking for is not successfully made, so when a new piece of legislation gets drafted they look for another way to make that link.

Another congressional observer agreed with this assessment: "I think that the kind of numbers we're looking for (in Congress) we can usually get fairly quickly within an acceptable allowance for error. Where you get into trouble is when you start saying, 'Okay, what does this mean, and what's it going to be like tomorrow'."

This comment reflects the congressional needs which frequently are not for data—which by definition must be historical—but rather for forecasts which can accurately predict consequences of policy actions. The need for accurate data on current fuels situation, for example, is felt by congressional spokesmen, but the most useful application of these for policy purposes is in projections for the near and intermediate future. Thus, while the data-producing professional, and the analysts, feel a strong need for good quality data (which make forecasts possible) the decisionmaker primarily wants anticipatory information, and most frequently, this means forecasts and projections. An added problem in this request is that the current energy situation changes so fast and is so volatile that past data can be an uncertain basis at best for judging and projecting the future.

The needs of academic analysts for forms of presentation are somewhat different from those of Congressmen, as characterized by David Wood of MIT. He made a plea for two forms of presentation of data that would improve his work as an energy analyst. One for an annual or regular data report in which permanent, reliable figures would be issued, replacing the preliminary figures that appeared in monthly or quarterly data reports, and stating in one place the firmer figures in data series for a given period of time. That would enable the analyst to build a reliable historical data base without having to sift through the monthly reports for each update of the preliminary figures. The second plea was for a computerized data base that would be usable by analysts both inside and outside the Government.

> When I'm doing real work, I want data on a computer system. That is I want the presentation to be very different from the book on the shelf. The present circumstances are that the government, not just EIA, but the government in

general, fails rather badly at that. We usually turn to something like a data utility, such as Data Resources, Inc., or others who have seen that there is a market for providing this information in the appropriate media for use, if not by Congressional staff directly, at least by the people we characterize here as the other users—scientists and others.

IV. Conflicts between regulatory and statistical data collection

The problem of the conflicts between regulatory data needs and statistical data requirements took up more than half the discussion in the first morning session, indicating the high priority such problems have in the minds of the data-producing professional community. The Energy Information Administration and its mandate were at the center of this discussion, since these problems were seen as a major obstacle to the accomplishment of several objectives in EIA's broad mandate.

The EIA collects energy data for regulatory purposes, which requires collection of detailed information on each actor in a given regulated situation—each refinery, each petroleum company, etc. It also collects energy data for statistical purposes, which requires collection of candid and often confidential data, usually on a sampling basis, that will allow an understanding of how a system is working, trends in the nation or a region, etc. Workshop participants identified numerous ways that collecting these two kinds of data in the same organization causes problems; these were compounded by the requirement in the Department of Energy Organization Act that EIA must share any information in its possession with other components of the Department, including the regulatory arms.[4]

The basic incompatibility of the two types of data collection was described by a Bureau of Labor Statistics participant:

> I think these are not compatible for several reasons. One, often times a collection of regulatory data precludes sampling, because you need observations on the entire universe. You get a great deal of conflict between the need for macro and micro data. You want macro information to give you a summary of what's going on in the economy. But if you collect data for regulatory purposes, you need to know exactly what every unit is doing, to see if they are in compliance with the law. The conflict between regulatory and statistical data is that statistical data needs a regular reporting frame, and consistency over time, so that one can analyze problems from a historical perspective. The regulatory data do not need that focus, because as the law changes, you may want to change your reporting format again, to make sure that units reporting are in compliance with the law.

The requirement that data collected for statistical purposes must be shared can seriously compromise a statistical data base, as several speakers noted. "The idea of sharing micro data is very defeating of a valid statistical program. The mandate that micro data must be shared, I think, puts EIA in conflict with their goal of developing good statistical data over time," the BLS speaker stated. A participant from the National Coal Association indicated that the most serious concern for many companies in responding to statistical requests from EIA is confidentiality.

> In terms of the collection of data from coal companies, I think the biggest concern that we have had expressed to us personally is the fear that this data will

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[4] Sec. 205(f) of Public Law 95–91 states: "The Administrator shall, upon request, promptly provide any information or analysis in his possession pursuant to this section to any other administration, commission, or office within the Department which such administration, commission, or office determines relates to the functions of such administration, commission, or office."

go beyond EIA and beyond DOE. Either to potential competitors or to potential prosecutors.

Participants brought up several serious costs to EIA caused by these conflicts. A major one of these was the inability of EIA to obtain sample frames developed over the years in other statistical collection agencies such as the Bureau of Labor Statistics, Census, or others. This prevents EIA from determining in the most efficient and economical way what formats and lists to use in their sampling surveys. Albert Linden of EIA stated:

In order to take advantage of sampling you need to know what the universe is, you need to have good frames. Currently, as our legislation now is, in order to do that, we have to re-invent the wheel. And that's a very, very expensive re-invention. We're not allowed to use [BLS] lists, we're not allowed to use the Bureau of Census lists, for good and valid reasons under current legislation. Despite all of our good efforts to have a nice form that is easily understandable to everybody, if you don't know the universe, it becomes very difficult to draw a good sample.

Another cost to EIA is that the agency is kept out of the mainstream of the Federal statistical establishment. One result is that EIA will be excluded from a recent initiative from the Administration to allow more data sharing among the statistical agencies, which allows the types of frame sharing described as important by all the participants from the statistical community and from EIA. Dr. Kutscher noted:

If that initiative goes through, such data sharing will not include the Energy Information Administration, because of their mandate to share data and their mandate to collect regulatory data . . . they are going to constantly have to re-invent sampling frames that BLS, Census, or Agriculture have already put together.

One significant ramification in this exclusion, according to David Wood, is that energy data are drawn from sample frames that do not match those of the other data series, such as those on economic and social trends. This results in the problems discussed earlier in this report, that energy data cannot easily be integrated with other types of data to reach conclusions about the role of energy in broad economic and social issues.

Several participants expressed concern that statistical data goals had been subordinated to the regulatory uses of data. Some congressional staff participants noted the historical roots of some of these problems. One speaker saw regulation as the basis for data collection.

Historically, whoever had control of the energy source, the supply, had control. We came into a situation where we, the United States, lost control; once we lost control, as professional crisis managers, we wanted to get into the regulatory mode. Therefore, the first data collection was for regulatory purposes.

The historical merger of statistical and regulatory purposes was discussed, beginning when the Bureau of Mines programs were merged with the regulatory data programs of the Federal Energy Administration. One congressional participant recalled:

Bureau of Mines did collect historical data on sampling frames. On the other hand, the Federal Energy Administration collected regulatory data. What happened when EIA was formed was that the two were placed together. And when that happened, Congress felt that there was a great need for credibility of the energy information, so you need to have a certain amount of openness in the information; therefore you have to provide access to that information. And to have this access brings up all the problems that we have discussed. . . . You can't keep your frames secret, etc.

A congressional staff participant who had been active in the establishment of EIA pointed out that the law as constituted left no room for discretion on the point of sharing EIA data with other DOE offices, and with other regulatory agencies. The arguments against providing distinctions that would allow statistical data to be kept confidential, according to this speaker were:

> That it would inhibit the convenience of the general counsel in prosecuting miscreants; that it would fail to be fully responsive to the interests . . . of the Federal Trade Commission and the Department of Justice. The arguments in general are, how in the world can you optimize the regulatory function if you don't completely subordinate the statistical function?

One solution advanced for this dilemma was the separation of the two functions. James Sweeney, of the Energy Modeling Forum at Stanford, suggested:

> Granted that the Department of Energy needs both types of information, the issue then is, why are all functions organized in the same administration? Can we move the system of data collection for regulation out of the Energy Information Administration into some other part of the Department of Energy, and allow the EIA to maintain a mandate for collecting data in order to support the analysis for Federal statistical purposes?

Ronald Kutscher also questioned this.

> They shouldn't be housed in the same group. It would be roughly equivalent to saying the Federal Trade Commission and the Census Bureau should be in the same organization. I feel there is a lot of incompatibility. There are very legitimate regulatory issues; there are legitimate statistical issues; but can you answer them through one single organization?

The likely predominance of regulatory concerns in such a division of these functions was expressed by Lillian Regelson, Assistant Administrator of EIA for Systems Support, who administers the regulatory support data systems for EIA. In terms of priorities, she said:

> One thing the Department of Energy could do is split EIA in half and move us to the different regulatory programs and get the regulatory information that way. One question for us is, would it really be in half? Perhaps all the resources would go to the regulatory piece, in spite of what a lot of people here in the community believe is a need to do something on a fairly high priority about the basic data system. The second question is, is that an effiicent way to get data for the Department of Energy?

Jimmie Petersen pointed out that the burdens on companies in responding to two sets of questions, one aimed at regulation, one at statistical findings, is very great. Having the two functions in the same organization offered the possibility for coordinating the questions asked for each purpose.

> You want to minimize the burden associated with monitoring and administration of a regulatory function. If you can do that without destroying the integrity of the statistical function, I think the point is that there is a balance, and you have to decide what it is and define it.

Another point raised was that, in the opinion of an EIA statistician, "statistical data collectors are more knowledgeable about the techniques and the procedures needed to collect good information than the regulatory data collectors. So I think when you do combine them, you get some benefits on that score."

Other than separating the two functions organizationally, it was suggested that two separate authorities could be used for the two

functions, allowing confidentiality and restricting disclosure of data collected for statistical purposes.

Dr. Lincoln Moses, Administrator of EIA, argued that the real need is for just such a distinction.

> I think to combine both functions in the same agency, if it can be done at all, must be done with a certain amount of clarity, and you can't sell one function out to the other and expect them both to thrive . . . . The law requires that we must give any data in our possession to any part of the department and the law imposes no restrictions at all upon what that part of the department may choose to do with it.

He argued in favor of a policy that would create restrictions on disclosure—either on statistical data entirely, or at least on the use made of such data once they are passed on to another entity in DOE.

Dr. Moses has made the attempt to preserve this distinction with respect to sharing EIA data with regulatory agencies outside DOE. He has attempted to restrict access to data collected by EIA on a confidential basis for statistical purposes. He stated that he is seeking a Secretarial policy on allowing distinctions to be made along this line.

> The reason we don't give it (statistical data) to them is that the data was not collected with the respondent understanding that it might be used against them. Many of these respondents gave data to the government as a favor in voluntary data collections, and now to suddenly find that turned it over to the cops is a violation of principle which I can't find in law, and I can't lose track of, either.
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> Now it seems to me that the fundamental way in which it might be possible to have the advantages you have in both data collections for regulatory purposes and statistical purposes in a common agency—there are advantages, but it's very risky, maybe doomed to failure—but if you are going to do it, then I don't see how you can possibly do the one without poisoning the other, except by always telling the respondent whether the data will be liable to disclosure for regulatory purposes or whether it won't—and then sticking to that.

However, some congressional staff members took issue with this approach. One speaker took the view mentioned above that under current law such a distinction can not be made. Another observer from the Senate Judiciary Committee argued that in antitrust enforcement, all types of data are relevant. "Those are the areas of law enforcement where virtually everything you collect becomes relevant, because you're looking at the relationship between the structure and the performance of the industry." Thus he argued that all types of data should be disclosed to regulatory agencies, from this point of view.

No resolution of these problems emerged from the discussion, but several participants mentioned that they had not realized the extent to which the conflicts between the collection of regulatory and statistical data caused such a range of problems for the basic purposes of EIA.

Afternoon Sessions

ENERGY INFORMATION—ANALYSIS AND MODELING

The afternoon sessions took up the issues related to energy analysis and modeling. The discussion is summarized below under three categories. First, defining analytical needs, in which the broad framework needed for analysis was identified in terms of the issues which analysts believed were the critical energy concerns. Second, areas which create problems for or limitations on energy analysis, including data limitations, problems with quantification of crucial factors, pressures on the

analyst reduce uncertainty and respond quickly, and inappropriate use of models. Third, the relationship of analysis to the energy policy process, the subject of the entire second afternoon session, evoked a lively exchange on the extent to which analysis can be isolated and "protected" from the policy process and still remain relevant and useful.

I. Defining analytical needs: What is required for good energy analysis?

It was generally agreed that the first step in defining analytical needs was the identification of the long-term issues that will continue to evoke (or should evoke) queries from policy makers and other users of energy information. Designing a framework around the critical issues makes it possible to respond appropriately and quickly. Costs inevitably increase as more detailed answers are required, however, and so the issues that are the center of such a framework are likely to be handled at a fairly general level, until an active need for policy in that area creates demand for more detailed treatment.

Issues identified were related to the various effects on society of the general transition from cheap, abundantly available energy to very expensive relatively insecure sources of energy; appropriate government policies and their effects; questions of wealth distribution related to price changes; costs of environmental protection, energy and economy interactions including an understanding of the real role of energy in the economy; and the need for an understanding of the impacts of foreign policy problems on our energy situation.

A changing perception of what is required of analysis was enunciated by some participants, who indicated that rather than looking for one answer to a question which would attempt to be definitive about specific energy impacts, it is preferable to have a range of answers, based on different crucial assumptions. A key to success in presenting these kinds of answers was seen in a clear, properly explained presentation in which appropriate qualifers had been made clear.

Basic to analysis, of course, was good and credible data, which was reviewed in the previous discussion.

Roger Glassey, Assistant Administrator of EIA for Applied Analysis, summarized his view of the major issues underlying and defining analytical needs in his opening statement in the afternoon. There was a good deal of agreement that the issues identified by Dr. Glassey were the major ones guiding analytical needs.[5]

He began by indicating that deciding what the analytical requirements are depends first upon the nature of the questions asked. Clients who ask for analysis are the policy staff and other areas of the Department of Energy, or congressional staffs, or the other agencies and staff of the executive branch. The first question is how much detail the analysis should provide; the limitation of available resources makes it impossible to afford concentration on minutia, and forces the focus to be on long-term issues.

I believe we are much better served by focusing our attention on broader issues at higher levels of aggregation rather than continuing to pursue the will-o-the-

[5] See Appendix C for the full text of Dr. Glassey's remarks, and the remarks of several other initial speakers, whose comments opened each of the four sessions of the workshop.

wisp of ever finer detail in analytical questions. How do we set our long-term goals? Well, simply by trying to understand better what are the long-term issues. In the first place, an issue, I think, is something which, unlike a problem, does not admit of a solution. An issue represents a long-term value conflict within the society.

Dr. Glassey observed that the very basis of the key energy issues is the transition from an era of cheap, clean, abundant energy to a time of relatively scarce and expensive energy. The U.S. first attempted to manage this transition by depending on cheap, foreign resources; but this then introduced a problem with the reliability of energy sources. There is a trade-off of higher costs for domestic and alternative energy sources against the unreliability of foreign oil. In the policy area, managing this transition means decisions on what Government policy instruments can be used to increase supplies and reduce consumption, and what social, economic, environmental, and other impacts are connected with these instruments. Among these policy decisions are those to do more research and development, to provide economic and revenue incentives, and others. One difficulty here, Dr. Glassey said, is to know which specific policy instruments will be of sufficient interest in the decisionmakers' minds to create demands for extensive analysis.

Another issue that creates analytical needs is the question of equity, or wealth transfers, which deals with which segments of the economy must bear the pain, and which ones reap benefits from the changing circumstances. Dealing with this question has resulted in contradictions in national policies, such as between raising energy costs to encourage fuel conservation, and keeping prices down to fight inflation.

Another issue which involves analytical demands, Dr. Glassey indicated, is the tradeoff between the cost of energy and protecting the quality of the environment. Still another problem area is the interaction between energy and the economy, an area in which analysis is difficult for reasons discussed in the morning session—the lack of an appropriate match between energy data and economic data collected by other agencies.

The magnitude of questions involved in energy analysis is a factor related to the level of detail that is important, according to David Munro, a staff economist for the Council of Economic Advisers, and a member of the PART team.

In terms of how to understand energy's impact on the economy, for the very broad questions, one's really interested in what does energy do to growth, to inflation, and to unemployment. If you're trying to get through a whole lot of little questions, you may never ever get to see whether those three answers that were really up front, which are the only things that a policymaker may well consume, are off the map or not. What you'd like to do is be able to test the growth, the inflation, the unemployment effects.

In order to do these kinds of things, what one needs is a total scale of the income transfer involved, and that requires an impact on the average cost of the resources involved, and on the volume of the resources involved, in total. The base from which this kind of thing starts to happen, is also of importance. Are you starting off from something that is 5 percent of the economy or 25 percent of the economy?

This also lets you judge once you know in some proportionate sense how big an impact an explosion you're seeing in one sector today will have on the whole economy. It may be a big explosion in this sector, but if it's a big explosion in the hatpin industry, it's not going to be big on the economy. But if you make an error of twofold on how big the energy sector is at the outset, it's big enough that that twofold error is going to lead you into all kinds of problems.

The impacts of foreign policy on the U.S. energy situation have a relatively new importance, and the uncertainty of this factor lends a degree of urgency to the understanding of what those impacts are. This view was summed up by Ben Cooper, of the Senate Committee on Energy and Natural Resources:

I think a lot of the problems that we have to face in energy are really foreign policy problems now, and they are more involved in some of the things which are fundamentally unquantifiable, which are not going to be much clarified by the traditional kind of parametric modeling. The best that energy information can do for us is to help us dimly perceive how some of these uncontrollable external events are going to affect us. That means we need accurate data and we probably need a lot of it, and we're probably going to be short on ways of making it all fit together in a neat theory. I don't think we should worry about that. We'll have to find people—there'll be some smart people come along just like there are in physics and chemistry who will show us the connections between these data, and they probably won't use a computer to do it.

An important contribution of modeling to energy analysis is meeting the need for replication. This need for consistency—to be able to reproduce results in the context of identifiable combinations of variables—was described by David Wood.

When we're doing an analysis as policy research, attempting to increase understanding, replication is extremely important. If you include in your definition of modeling the capability for replication in terms of data, in terms of calculations, in terms of the combination of concepts, then I don't know that there is any alternative to modeling for meeting these needs.

Mr. Wood discussed a distinction between research models and system models, and he related this distinction to the mandate the EIA has to do analysis which implies the necessity to do modeling. The research model attempts to structure hypotheses about behavior or events, and might provide a capacity to do narrower, specific forecasts, or analysis of behavior in one sector; system models attempt to incorporate data, scientific information, and other concepts that come out of the research modeling, in a framework that gives an overall, comprehensive analytic capability. EIA has been mandated to do the latter, as Mr. Wood sees it. He said:

Perhaps it is useful to distinguish the research kind of modeling from the kinds of demands that seem to be fairly explicitly placed on EIA, which is information system analysis. If you look at the EIA legislation, you find many phases which suggest that the modeling function was really intended. The spirit of it was to provide a capability not just to dump these numbers out on the table, but to provide some capability for their analysis and interpretation. I've always taken that to mean not so much research modeling, as attempting to incorporate the results of research modeling in a comprehensive framework.

Model credibility is also related to this distinction; but it begins with credible data, Mr. Wood indicated.

First, the data must be credible, in the sense that the process by which it's collected, the process by which it's combined into accounting systems, represents good statistical practice, is well presented, etc. Model credibility begins with this—just those issues we were talking about this morning. But there is more to model credibility, because it involves not just data, but concepts; it reflects some theory. There's the question about that theory—is it, or the elements of it, well received in the appropriate disciplines, how many hypothese are reflected in that model which we feel are important to resolve. These kinds of questions then stimulate the research activity, the research kind of modeling. You need research models done in environments where there is a discpline on what gets accepted, because of publication, peer reivew, and so on; then we tend to know what we mean by credibility.

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Need for clear explanations and multiple perspectives.—Given some of the limitations discussed below of any given model to give one "correct" answer, there was agreement among participants that there is a need for the use of several viewpoints, or paradigms. This gives the analyst or the policy maker a chance to assess the results of models from these different perspectives.

As James Sweeney put it:

> The basic point is that modelers have caused a lot of criticism of themselves by selecting strict numerical answers from one way of thinking about the problem, without always checking through whether they get to totally different conclusions from different paradigms. So I am hoping this mechanism continues to be used—developing very simple conceptual models and at the same time have the more complicated models to check your conclusions. Then communicate things in terms of the simple model, and also indicate that here are some of the answers, and these also can be justified by a much more complicated computer system.

Ben Cooper made a plea for more than one perspective, with room for a determination by the user of the information as to what was useful for his purposes:

> It's much easier to believe information that is told from two different forecasts, and not asking me to believe the absolute value of either forecast. That way, by subtracting those two numbers, you lose a lot of assumptions and errors. I think we ought to focus more on how some key output variable changes—impacts—rather than trying to build large descriptive systems that are going to, in an absolute sense, tell us how the universe works.

David Munro seconded these views, based on his assessment of the current capacity of any model to encompass all the necessary variables.

> Our instruments in the various models, and the data they rest on, are still sufficiently imperfect that it is better to conduct a research strategy that lets you take three or four independent estimates, at least as independent as possible, and use these as suggestive leads on where the others may really be out of whack. This is far better than trying to work through to the 'nth' detail with just one model. There's just not a prayer in the world that the theoretical ideal model is within grasp in this area, and I doubt it will be for some time.

II. Problem areas and limitations on analysis and modeling

The discussion of problem areas in analysis and modeling focused on several themes: data limitations, pressures to reduce uncertainty, problems with quantifying certain kinds of variables and the ways these could be handled, need for better understanding of energy and its role in the economy, developing trust in modeling on the part of users of energy information confidence which is lacking, and the translation of modeling results to users in such a way as to develop this confidence. Specifically related to confidence in modeling were problems with using computers and quantification.

Data limitations.—One of the most basic limitations on analysis, and modeling in particular, is related to the data available. One congressional staff participant noted that data limitations are significant in complex models: "One of my concerns, is that the complex models easily exceed the quality of the data that's put into them. This crossover point comes pretty quickly."

Roger Glassey indicated that data limitations are real, but that there are ways to deal with them through clear communication—and the process produces feedback which influences and improves design of data collection systems:

What are the limits on modeling? Well, one obvious conclusion is that if you don't have any data, and simultaneously you don't have any theory, you cannot do a model. And anyone who attempts to do modeling lacking both data and theories simultaneously shouldn't be taken very seriously.

It is sometimes useful, however, to construct some models even if you don't have all the data you would like to have—which is where we always are when we try to construct models—because frequently the modeling exercise can tell you which variables are significant in the answer, and that information could be very useful in designing the data collection system, among other things. However, as modelers we have an obligation to be very clear in our explanations as to which of the model inputs were data, reasonably well validated, and which ones were guesses, and what effect the guesses have upon the answers. The trouble is, it takes many pages to describe all this, and fairly patient reading on the part of the users to understand all this, and we do have a communications problem.

A Bureau of Labor Statistics participant reiterated his concerns over the lack of energy data that could be incorporated in major economic considerations. He related this to specific limitations on model ing:

One of the major models is the model embodied in the national income and product accounts, and there are some very substantial limitations placed on that model and on models which are, in effect, dependent on it—models of employment, economic growth, inflation and so forth. These are aggregate models of substitution where, for example, high energy prices may have a substantial impact on tax policy or whatever. These limitations arise from the non-integration of energy data with the Federal statistical program generally.

The structure of production that's reflected in the national income and product accounts, outside manufacturing, is based on the 1967 input-output table, when there was no energy crisis. Next year that will be updated, and we will have the structure of production, the modeling of energy relationships with other production factors as of 1972. Not until 1986, 13 years after the energy crisis, will we have for the first time embodied in the national income and product accounts, updated, post-energy-crisis information, which reflects the structure of production after prices for energy went up substantially.

It seems to me that this is not only a major limitation on our modeling capability and on some of the inferences that we draw about the effects of energy on employment, economic growth, inflation and what not; this is also, in some measure, a repairable problem, a problem which is repairable by addressing the issue of integrating the energy accounts with the national income accounts.

Pressures on the analyst: to reduce uncertainty and increase timeliness.—Pressures by policymakers and users of energy information on analysts to produce answers quickly or with very little uncertainty or qualification may result in problems which reduce the usefulness of analysis.

Lincoln Moses summarized the trade-off which occurs between quality of analysis and timeliness pressures, and suggested that adequate preparation, the laying of appropriate groundwork, can ameliorate the problem, but not solve it:

Let me talk a little bit about the tradeoff between timeliness and quality with respect to future information, or forecasts. Here the role of preparation is less, but it's important. By being prepared, you can have adequate documentation. well-organized files, current data bases, efficient computing programs, and staff familiarity with all this. Those factors are an important part of the justification for doing our annual report. We get everything updated, we get everything kind of clarified, everybody gets used to using it, baseline forecasts are prepared, and future questions that come up in the course of the year will be better treated for that preparatory exercise than they might otherwise be.

But mainly, there is a very sharp tradeoff between qua'ity and timeliness in this forecast area, because of the ways to be timely with a forecast—there are several ways to be timely with a forecast—but most are adverse. You can skimp on formulating the problem. You can skimp on thinking about the analysis strategy. You can check the data less thoroughly. You can check the code less

thoroughly. You can skimp on your uncertainty analysis. You can write it hastily, or you can even use teams—one person writes the conclusion and another writes the introduction, and somebody else writes the analysis, and then we'll get out a pastepot and put it together—it saves a lot of time. But it is a tradeoff of quality for timeliness.

Finally, in the forecasting area, many of these problems can be eased by using the simplest available models that will do the trick rather than more elaborate ones.

Dr. Moses indicated the importance of providing an indication of the factors which produce uncertainty in a given analysis or model, and distinguished between uncertainty and accuracy. Roger Glassey elaborated on the ways in which the desire by information users and decision makers to avoid such uncertainty puts by pressure on analysts:

We're sometimes victimized by the notion of uncertainty, and who has got to take the heat. The future is always uncertain, no getting around it, and the effects of policy choices are always to some degree uncertain. The policymaker would like to avoid the very unfortunate situation of having to make decisions not knowing precisely what's going to happen. So he asks some analyst to tell him what will happen. The policymaker, the Congressman who has got to vote, would like his staff to be able to tell him, if I vote this way, what will happen to unemployment in my district? He'd really like to know that answer, and is understandably very disappointed when the answer comes back. "Well, we can't tell"—or the answer is "maybe it will go up by two and a half percent, or drop by 6 percent or maybe go up by 10 percent and that's the range of uncertainty: we really don't know."

I would suggest that the distinction between staff analysts on the one hand and decisionmakers on the other is that the decisionmaker's job description calls for him to be the uncertainty absorber in this situation—not the staff analyst. The staff analysts can try to define what the range of uncertainty is—what's known, what's not known, what you might plausiby deduce, and what you are never going to know. And that's as far as his responsibility goes. Sooner or later the guy who wears the hat as the decisionmaker, whether it's the Secretary of Energy, or the President, or the Congressman who votes, is just going to have to say, "Okay, I don't know, there is this uncertainty, and my job calls for me to make the best decision I can under the circumstances." It's a very uncomfortable situation to be in.

So, part of the dilemma that EIA is in is that we are occasionally asked by decisionmakers to be the uncertainty absorbers in the game, to impute more precision to our numbers than is warranted, thereby giving the person that has to make up his mind how to vote a greater feeling of warmth than he is really justified in having under these circumstances.

Limitations on modeling.—A number of situations which limit the usefulness of modeling were discussed. These involve areas where quantification is a problem, where key variables are not included because they don't fit into models, and objections to computers in the minds of information users. On the other hand, in the opinion of some participants, all analysis is modeling, whether explicitly or not.

Roger Glassey indicated areas in which modeling is not useful, and argued the case for modeling as the basis for most analysis.

There are certain areas in which I don't think modeling is worthwhile attempting at all, and that is when the crucial question has to do with predicting the future behavior of a political or regulatory body. For example, one of the points of criticisms on our last annual energy forecasts was the forecast for a rapid shift of the electric utilities out of oil and into coal under high world oil price. This is cost-minimizing behavior for a utility. However, it may not be the behavior which the decision-making complex, consisting of the utility and the PUC's and the air resources board, and the state siting board will finally come to. Our ability to predict the way that complex of decisionmakers will act is really not very good. We think we can compute what a cost-minimizing behavior will

be, but predicting the way in which regulatory and environmental constraints will act to inhibit cost-minimizing behavior defies the ability of the current state of the modeling art, and may even defy man's ability to understand.

On the role of modeling, Dr. Glassey went on,

Now, what is the role of other types of analysis? In the first place, I suspect that if you don't have any theory and you don't have any data, no other type of analysis, including modeling, is going to do you any good either. It may be interesting to write essays, and philosophers have done that for a long time, and that may be of some guidance. But I would argue that there is no such thing as an analysis that proceeds without the use of a model. The only question is, how explicit is the model? Is it all written down, does it take mathematical form, is it incorporated as a computer program, or is it a mental model, a worldview of the guy doing the analysis, which may or may not be explicit, may or may not be all written down. But analysis, I argue, cannot be done without a model. The only question is, how specific, how detailed?

Ben Cooper of the Senate Energy Committee described what he saw as a law of diminishing returns with respect to using computer modeling. The drive to computerize vast amounts of material and make connections among the data is the first step, he said, but with that step done, there is a need to go beyond the factors that can be put into a computer model, in order to understand the real world. He related this to difficulties in quantifying some of the key variables.

One of the questions that I would raise about the way we look at models and analysis in a quantitative sense, is that a lot of this is built upon the theory that most people try to optimize their behavior in an economic sense.

I really wonder whether any analysis which is really based on that is much use. I think people probably optimize with respect to a lot of things, and once you go through the list of those things, you wonder whether it makes any sense to try and deal with them quantitatively. I'm sure that the people who determine how much oil is produced in Saudi Arabia are concerned with their revenues, and they are concerned with how much of the market they have, and where their oil goes, whether it goes to the European market or the American market. But they also optimize with respect to their expectations about the PLO and Russia and the United States, and optimize with respect to a lot of feelings that I don't understand. Any mathematical model I write about those people, I think, is going to leave most of that out, and I don't think it's going to tell me very much.

I think we ought to try and look at what are the key variables, and make the output of the models a direct function of the uncertainty of the key variables, and quite often we don't do that.

Another congressional staff member related some of these difficulties in the mind of policy oriented users of energy information to distrust of computers, rather than models.

Computers are those things which send you your bills and make mistakes. They don't think in human, sociological terms, they don't recognize political constraints, they don't incorporate all of the things that Roger Glassey so rightly admitted are not amenable to computer modeling. Therefore, policy makers, that is, non-modelers, non-analysts, have a tendency not to believe the results.

Ben Cooper disputed this, saying people believe computers too much, without regard to limitations of the types of variables that had been taken into account. A participant from the Office of Technology Assessment related this disparity of views to a continuing debate and tension between the modeling community and the policy and decision-making community. One answer, he concluded, was clearer presentation, with appropriate qualifiers.

On the one hand I hear Roger Glassey and David Wood saying that you analyze in a structure, and that structure is nominally an economic structure, and if you don't do that you are a heretic, you don't have a structure.

And I hear what Ben is saying, which basically is that that is only a piece of the equation, that the other elements must be considered, and that if you are only bringing one piece of the equation there, don't represent that as finished. I think our problem is that we treat a model's output as final analysis, but basically it's only partially analyzed. At least from the policy analysis point of view, you must consider the things that Roger would set outside—and that is the environmental and social and political aspects of what is going to happen in the real world.

So, the information that comes out of the model that analyzes an economic regime is very important, and the structure is important, but it is just the beginning of ordering data, so that you can then analyze what the effects on society are of these various paths.

To the objection that this meant doing no analysis without achieving a world model that incorporates everything, he went on to say:

The reason we end up criticizing models so often is that the analysis coming out of the model is represented as being what you should plan with when, in fact, it is only in raw form, and you then must apply other considerations to it. So we end up criticizing models not when we wish to, but because the analysis coming out of them is believed as finished analysis. It takes a lot of pages to qualify analysis, but it is better to spend the pages to qualify it, than have your data thrown out as either a misrepresentation or not sufficiently analyzed to be useful.

The need to recognize that the output of a model can only be a part or a fraction of the answer to most policy questions was reiterated by several participants.

The importance of the description and explanation of modeling results were also emphasized by other participants, as it was by Dr. Glassey in his opening remarks. Congressional staff member Paul Basile noted the importance of being able to explain the components and output of a modeling exercise using the variables involved, without reference to the model itself.

I think what decision makers would like to see is good analysis, explained carefully. An example is the CIA report of about August or so on the world oil market. It was long enough to be thorough and short enough to be readable. It went through a careful, logical explanation of exactly what issues were involved, with the assessment of available information.

In the back there was a mention of how a model was used in a certain way. One came away from that document feeling that there was a lot of credibility generated in the analysis, because it was explained by someone who seemed to know exactly what they were talking about in terms of substance, with analytic techniques that helped support this understanding. Not because the analyst referred to his model. It seems to me, when you're done with a model, you should be able to understand why it had the results it did, and then explain it, independent of the model.

Over-use or inappropriate use of models.—Participants discussed the problem of inappropriate use of a model that may have been useful in the past, but may not fit the current situation or set of variables. Because so much work goes into building a model, and because the analysts who built it become familiar with it and feel they know its weakness and strengths, there may be a reluctance to do major rebuilding, or to invest the energy in building a wholly new model. Roger Glassey and James Sweeney described this problem, and Dr. Sweeney suggested that one solution is turnover of personnel handling a given model or analytical area.

Roger Glassey characterized this problem as building upon accumulated intellectual capital:

We have a certain tendency to try to build upon the accumulated intellectual capital of the past. If an analysis is done by use of a model which is sufficiently

formal to admit of a mathematical representation and then translation into a computer program, at least we have a chance to verify whether the arithmetic gets done right; there are other things in the model that are harder to verify. There is a tendency to want to use that piece of intellectual capital, rather than invent it all over again. Now, that tendency can sometimes be perverted to the point of recasting the question which was asked in terms that can be answered with the available stock of modeling apparatus. And that's a trap we would like to try to avoid dropping into any more than we do already.

As James Sweeney put it,

The point that the analysis tends to decay, quality decays and gets further behind the state-of-the-art can be true. There are some ways that you avoid that, and one of them is flow of people through the organization. Turnover is costly, but it's also beneficial because it brings in new ideas and new challenges to the analytical system and there is always, in any organization, an "invented-it-here" philosophy. "We've spent a lot of time working on this analysis, so no matter how dated it is, it must be good." It is really valuable to have a whole new group of people in, who have none of their professional identities wrapped up into the system. They can feel free to scrap it as they see fit and that's one of the most fundamental protections that you have against this problem.

III. Energy analysis and the policy process

The foregoing discussion, as we have seen, gave considerable emphasis to the relationship of data, analysis and modeling to the final policy decision processes at the congressional and senior executive branch level by describing who must have "uncertainty absorbing" decision-making responsibility. The final session of the day concentrated on the working level relationships between the data and analysis agency (EIA) and the policy and formulation processes in Policy and Evaluation and other staff of the Department of Energy.

Several participants recalled the history of the establishment of EIA, and the intended separation of the agency from the policy makers and decision processes in the Department of Energy. This was intended to give the agency an "objective" viewpoint for its work. The purpose was to provide an impartial source of information as the basis for decisionmaking by the policy arm of DOE. It was not intended to isolate EIA from working relationships with the rest of DOE.

However, this separation has led to an uneven level of utilization of EIA by the staff of the Assistant Secretary for Policy and Evaluation, and other components of the Department. It has also led to a perception of EIA as quite reliably independent of pressures and biases that could be induced by those other parts of DOE. Although obtaining objectivity is valuable, some participants questioned whether it was not achieved at too high a price—isolation and resulting lack of use of EIA's capabilities.

A congressional staff participant recalled the history of EIA's establishment, and the stress at that time on creating an independent entity with "the basic job to collect the numbers in a credible way." The analytical function crept into the concept "because we didn't just want boxes of numbers. So, we wanted the ability of someone to cast these numbers in a way which is at least relevant to policy questions. Then we went a little bit further and said, 'well, if this agency is going to interpret these numbers, it has to have some involvement with how they're used in a modeling sense and in a policy analysis sense. So let's set up some sort of ability for it to ask the right questions, and to deal with them.' "

Although this participant expressed regret at the possibility that EIA expertise was neglected as a result of the insulation from the policy process, he added that in terms of priorities, the credible collection of useful data would take precedence over the analysis function in EIA, in terms of the original intentions for the agency.

Lincoln Moses indicated that he felt the direction taken by EIA under his leadership to avoid controversial issues, to build the data base, to err on the side of over-completeness in documentation and demonstrated objectivity is the right bias, instead of "shading the other way in favor of responsiveness." But he added, "I kind of regret that we don't get asked a little more often (to do analysis) and I think we can do some things about that, such as reduce the ponderousness of some of our processes, so that the answers come back in one's own lifetime."

Considerable argument in the discussion centered around the role of EIA—whether the agency should have a more limited analysis function, or a closer relationship to the policy process in the Department of Energy, than it is now has. Some speakers asserted that EIA should have a very limited analysis function, or none at all; others indicated that the present separation of the analysis function from the policy process in DOE has resulted in underuse and neglect of the analysis function, and EIA should be closer to policy processes. On closer inspection, both these arguments were in agreement that good analysis is hard to achieve in a situation like EIA's, with organizational separation from the policy process. The speakers who took these positions actually did not ultimately care whether the analysis function was in EIA or not, but argued simply that to be relevant and responsive, analysis should be closely linked, preferably organizationally, to the policy and decision-making staff.

Arguing against this view were speakers who saw the likelihood of an erosion in objectivity, and a loss of credibility if the two functions are housed in the same office. This was the problem that had plagued the predecessor of EIA, the old Federal Energy Administration, and the same problem that led to the present separation of analysis in an independent EIA.

Denny Ellerman, formerly in the Policy and Evaluation office of DOE, making the point that EIA should have less involvement in the policy process, argued that there are plenty of analytical capabilities in other places—in DOE, in Congress, and elsewhere.

> I would argue that EIA's role in this process, leading to good energy analysis that all of us believe in, is to narrow the area of speculation, and to concentrate on the data and those premises which can be verified through various analytical techniques by which we can test hypotheses about how the world behaves. The role of EIA becomes one, essentially, of focusing on the data, interpreting that data, and perhaps working on analytical issues which are of more underlying or long-range type issues.

A participant from BLS underlined some dangers in having a data collection agency too closely aligned with policy analysis.

> I think there is a standard that one should watch, and that is, to what extent will the involvement of the data group in policy analysis affect the public's perception of the data they must produce? If the extent they go into policy analysis goes over into the policy advocacy side, then I think the public's perception of the data they produce may be clouded even if, in fact, it has not been altered. The question is, how do you draw the line between policy analysis and policy advocacy?

He indicated that he saw the "wall" built around BLS between their basic data activities and the policy analysis functions outside the agency as valuable, and it did not shut the agency out of all participation in policy consideration:

> I think that even though we have a wall built around us (and incidentally, BLS's wall is not legislatively built, it's built by tradition), we do participate by providing data and analysis in the policy. The Bureau, if asked to participate in what might be perceived as policy analysis usually assists the agency. Usually it's done in such a way that when the policy is announced, it's never announced that BLS put their stamp of approval on any of the undergoing data or analysis.

One reason for separating the policy function from the analysis function organizationally was described by another BLS participants, and others agreed:

> One reason for separation between the policy and the analytic functions, there is a tendency for capture through time that tends to assert itself, even if initially you have good, independent analysis going on. If the relationship is too close, there is a very strong tendency for more and more of the analysis group to become involved in firefighting, and in fact for the level of analysis to begin to fall by degrees way behind the state of the art. The first thing you know, you've got nothing but fire fighters looking for approval from the policy makers.

Countering these points were the several participants who felt that a close connection between analysts and policy makers is essential, with a high cost to be paid for the separation which is inherent in EIA's current mandate. The discussion turned on the role of EIA in this context; but at least some of these speakers felt that whether the analysis role was in EIA or not was irrelevant—the point was that the primary analytical function should be housed with the policy function.

James Sweeney recalled the "agressive policy role for the analysis function" in FEA when he was there, and while he admitted that institutional pressures in the policy environment do work against honesty in analysis, he argued that, with appropriate safeguards, honesty can be preserved.

Dr. Sweeney outlined four major functions of analysis, and said he believes EIA is currently doing only the first: (1) provide broad overview of the decision environment; (2) indicate the impacts of broad policy motifs; (3) estimate the impacts of specific policy options; and (4) the justification and explaining of the recommended policies. He said:

> My impression is that EIA seems to have very significantly shied away from any but the first, and possibly the second of those functions, partly because the legislation is putting fairly high walls between EIA and the policy process.
>
> From my view at Stanford, it seems that these high barriers between the policy process and the EIA may help improve credibility of EIA because there's less question that analyses are being influenced by policy concerns, but if this is happening, it's at possibly an unacceptable cost. It seems to me that EIA is probably playing too limited a role in several policy functions.

Two important functions EIA is not currently able to carry out, due to its separation from the policy staff, Dr. Sweeney said, are (1) helping to kill bad ideas, and (2) helping the policy people ask better questions, formulate better policies and better understand distinctions between policy options.

The safeguards needed to assure honest analysis within a policy environment would be a strong administrator, publication of regular reports so that outsiders can evaluate the quality of the analytical

work, and outside organizations such as the Congressional Budget Office, CRS, academic modeling groups, and interest groups with an interest in the results.

One of the major costs paid in the current system, according to Dr. Sweeney is the neglect of EIA's analytical capabilities:

> There is a lot of modeling and analysis capabilities that are implied in EIA to get long-run projections of the energy environment and that there are groups of people in policy offices that are doing some hip shooting.
>
> I believe that those two groups should be closer together, and whether they should be in EIA or in policy and evaluation, I am virtually indifferent to that. But pulling them together keeps you from making a lot of mistakes.

He cited instances in which policy recommendations were made in areas where considerable work had been done by EIA—work which the policy staff had been unaware of, and which had gone unused in the decision-making process. "That's the sort of anomaly that you get into when you keep those functions too separate."

Walter Schroeder of the Federal Energy Regulatory Commission, speaking from his perspective as a former staff member of the House Energy and Power Subcommittee, noted that the separation of policy from analysis can lead to the loss of experienced, expert personnel, particularly those with sensitivity to and interest in appropriate policy questions. He commented:

> EIA started out—before it was EIA, when it was FEA—as more like the institution that Jim Sweeney is talking about, where you had an interrelated data collection and policy analysis function. That had both strengths and limitations to it, as far as I's concerned. It's now by law something that looks more like Denny Ellerman is recommending, with a more pristine data collection and compilation mission, not to be polluted by the temptations of policy.
>
> I'm not sure which is the right choice, but I think there are some pretty serious implications of either choice, and it ought to be a conscious choice. I'm not sure we have fully examined the implications involved.
>
> Most notably, what I've seen in EIA over the several years of its former and current incarnations, has been that a lot of the good staff who are sensitive to the needs of the audience that the Department plays to—both the Congress and the public—have left, because they've been told that they're not allowed to do policy. And frankly, if I'd been there I would have left, too.
>
> It's a question of what do we want EIA to be. In my current role at FERC, I've come to rely on EIA much more for providing the kind of data support that is part of their mission and which I think they do much better now than they did two years ago, much to Dr. Moses's credit.
>
> But I don't think that's enough, frankly. And I don't think in the long run it's going to be enough for anybody. So I worry about our having drawn artificial distinctions between policy and analysis that, in the long run, may make both functions be performed less well.

David Montgomery, a participant from the Policy and Evaluation office of DOE, indicated his view that the analysis must be closely tied to the policy function in order to keep the analytical function accountable and responsive to policy needs. The need for EIA's capabilities in the policy office at DOE is evident to him, he indicated.

> Given that it [EIA] has a modeling capability, I just can't escape thinking that we need to utilize that in the policy process. I have a very hard time figuring out how to do it, though, and I think it goes deeper than simply budget constraints or even the unwieldiness of the system.
>
> What I am worried about is the degree of scrutiny and care which EIA needs to put on its products before they release them to us for our use, which makes the system ponderously slow in responding. And I think the reason for that is the walls that have been built by the legislation between EIA and policy. To

some extent, I think people can get over this problem because part of it is a matter of trust.

My feeling is that someone on a policy staff has a great many other defenses, as it were, when he is uncertain about facts in the world and yet has to make a recommendation. EIA has nothing to rely on except the validity of the reports which it produces. EIA is not judged in terms of the desirability of the policy outcome that results from it. It's only judged in terms of whether or not that forecast was right.

He went on to indicate that beyond a modeling capability, what EIA should offer is the expertise in energy issues to be able to provide some judgment on how to apply various kinds of analysis or models.

One of the ways EIA has tried on occasion to minimize its involvement in controversial analysis tasks has been to ask the client—the user of the results who requests the analysis—to specify come of the assumptions to be used in the model.

David Montgomery went on to say:

I think EIA makes things worse for itself by asking the client to specify the assumptions. I don't think you should spend so much time getting us to break down exactly what it is you want to run. You will inevitably run into a problem, unless you're willing to make your own judgment about what assumptions are appropriate and not to run whatever somebody asks you for. EIA has to have enough understanding of the political context and of the existing law and of the real operation of the industry to be able to say, "That's a bad assumption."

Roger Glassey responded to these points by indicating that in EIA as it is now operating, he finds it possible to operate in an analytical mode without falling into an advocacy position. He elaborated on the gains to be made for the analysis staff in working closely with the policy staff, and that both the satisfaction of doing so was important, and also that the direction of the analysis was improved.

There was a study on the power plant industrial, fuel use act for ERA which involved a great deal of close interaction with the policy designers—and one of the roles that we've played, that was never documented, was encouraging them to ask the right questions. We kept asking, "What are you guys trying to accomplish here, anyway?" And after asking this question over and over and over again, more clear answers began to come back when we asked that question. I think it was a useful thing for us to do.

We don't get the chance to work as closely with congressional committees or even with congressional staffs as we do with people within DOE so it's a little harder for us to, by direct personal interaction, get the questions refined. For one thing, the staffs are pretty busy. But it certainly is a lot of fun to discuss with a client how the question ought to be phrased, what are assumptions that ought to be made, what are other ways of looking at the question and, in fact, the time spent in this part of the analysis may be the most valuable part.

I think the analysis on this power plant industrial fuel use act had some demonstrable effects on the way the rates evolved. We were successful in killing a couple of bad ideas. Not because the big model said so, but because the big model gave us the clues to why it might be a bad idea, and then back-of-the-envelope calculation convinced the analysts, the writers of the regulations, that it was a bad idea.

We also worked very closely with the P & E folks in the production of our annual report. One of the smarter analysts from P & E was almost part of the analytical team that produced the baseline forecast in the annual report. That interaction turned out to be extraordinarily useful for us, because he turned out to be a first rate critic, and did keep asking questions that had to do with policy perspectives that our shop didn't have.

The Workshop discussion did not result in a resolution of this dilemma; but there was wide agreement that close interaction between the policy maker and the analyst/modeler was a desirable part of both

processes—analysis and decision-making. Whether or not the two actors must be housed in the same agency, or whether the organizational separation can be overcome by good communication and trust was not decided in the workshop discussion. But it did appear that some dissatisfaction existed on the part of those outside EIA with the current process, and the EIA spokesmen expressed a wish to be more closely involved than they currently are in more interaction with their policy-oriented clients both outside and within the Department.

Summary: Cross-Cutting Issues

It was clear that many participants felt both stimulated and somewhat frustrated at attempting to deal with so large a set of issues in a one-day workshop. The issue range was especially broad, including questions of design of data collection systems, methods of analysis, appropriate allocation of fiscal and manpower resources, efficacy of modeling, factors that limit data and analysis, and the relationship of data, analysis, and modeling to the policy making and final decision processes. Many of those who attended remarked that this workshop was the first opportunity for so many principals in diverse areas dealing with energy information to get together for sharing of concerns and prospects. More opportunities to meet in such circumstances was viewed as having salutory effects.

One area of substantial agreement was that there is an apparent gap in expectations with respect to energy information. Those dealing with data collection, analysis and modeling responsibilities appeared to feel that substantial progress has ben made in establishing increasingly better data system, and that analytic work has led to better—though far from perfect—understanding of energy issues in a very broad sense. And that the areas of ignorance were fairly well described, with work was underway to deal with those major uncertainties.

On the other hand, those with policy responsibility tended to feel the need for faster responses, less uncertainty and more appropriate detail. They tended to view data with suspicion, and analysis as subject to often serious drawbacks. The point was raised that the expectations of those in the policy areas were for information that would make the decision obvious; failing that, the pressure on the information community was for ever changing permutations of information, with constant pressure for immediate answers.

This illustrated the tension between quick responses and accuracy which permeates both the energy data and energy analysis fields. The information professionals were reminded of the urgency facing policy makers which makes quick reponses important; congressional and policy staff were reminded that there is a trade-off in precision and accuracy that is made when information or data are produced on a crash basis. One realization that grew out of the confrontation between these two realities, was that there is a need for a very clear presentation of data and analysis by those who produce them, so that all of the qualifiers, and the impacts of the uncertainties present in the information, are carefully explained. Conversely, it appears that on the part of the information consumers—policy people and others—there is a growing willingness and even a desire to deal with the sometimes more complex answers to their questions, based on the realization that analysis usually can produce only a range of probabilities, rather than one definitive answer or policy choice.

The purpose of this workshop was obviously not to solve all the problems identified, but to bring them into a perspective what would assist policymakers to understand the limits of data and analysis, and to assist the analysts in understanding the kinds of pressures which the national decision process must take into account.

There is a tendency to search for solutions in structure rather than in substance. Thus, the workshop spent a good deal of time discussing whether reorganization of responsibiilties might solve fundamental problems. Several specific problems caused for EIA by its mandate were identified—in particular, its requirements to collect both regulatory and statistical data under broad data sharing requirements, and its relative isolation from the policy process. While no conclusions were reached, or agreement found, the process of debate made it clear that better communication and more realistic expectations on all sides would be helpful.

Finally, most participants seemed to agree that there is a need to state clearly the problem set to be analyzed. This step establishes the type and amount of data to be collected and ultimately establishes the time frame within which careful answers may be expected. While such information is not the only factor a decision-maker needs, good information should not be ignored.

APPENDIXES

Appendix A

Agenda and Issues for Discussion

Workshop on Energy Information, Congressional Research Service, Whittall Pavilion, February 6, 1980

9:00—Welcome and Introduction: Susan Abbasi, Congressional Research Service

9:05—Workshop overview and outline of goals: Loren Cox, Executive Director of the MIT Center for Energy Policy Research, Moderator

In each of the issue areas organized below, the goals of the discussion are to address several basic, cross-cutting issues: What are the needs and expectations of Congress and other information users in each area? Are these expectations realistic? How well are these needs being met, and where are the gaps? How can we assure that energy data and analysis are credible and useful? What is the role of energy information in the policy process?

MORNING SESSIONS: ENERGY DATA COLLECTION AND QUALIFY

9:15—Session I: Data collection

What are the overall energy data needs of Congress and other users?

How are these needs currently being determined by energy information producers? How can useful data programs be designed?

What is possible to collect, and what isn't?

Are the requirements for collecting energy data different from those for other types of data?

Are there contradictory or conflicting requirements in the mandates of the EIA?

Are there inherent conflicts in requiring regulatory and other data to be collected by the same agency? What are the problems for EIA in (1) collecting and (2) sharing data?

Initial speakers:

Jimmie Peterson, Assistant Administrator of EIA for Energy Data Operations;

Ronald Kutscher, Assistant Commissioner, Bureau of Labor Statistics, and member of the Professional Audit Review Team for EIA; and

Michael Telson, Energy Analyst, House Budget Committee.

10:45—Coffee break

11:00—Session II: Assuring data quality

What is important in assuring the quality of energy data?

How can credibility of the data be assured: verification needs.

How to deal with data collected from other agencies and from industry: should EIA do more direct collection and verification?

Initial speakers:

Charles S. Smith, Assistant Administrator of EIA for Energy Information Validation;

Barbara Bailar, Associate Director for Statistical Standards and Methodology, Bureau of the Census, and a member of the Professional Audit Review Team for EIA; and

Michael Woo, Energy Research Analyst, Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce.

12:30–1:15—Lunch

AFTERNOON SESSIONS: ENERGY ANALYSIS AND MODELING AND THE POLICY PROCESS

1:15—Greetings: Gilbert Gude, Director, Congressional Research Service

1:20—Session III: Energy analysis and modeling

How are analytical needs defined? How are long-term goals for analysis identified? What are EIA's goals in this area?

What must we know to better understand how energy affects the economy and society? What is needed for energy policy?

What are the limits of modeling? What is the role of other types of analysis?

Initial speakers:

C. Roger Glassey, Assistant Administrator of EIA for Applied Analysis;

David O. Wood, Associate Director, MIT Energy Laboratory;

David Munro, Senior Staff Economist, Council of Economic Advisers; Member of the Professional Audit Review Team for EIA; and

Ben Cooper, Professional Staff Member, Senate Energy Committee.

2:45—Coffee break

3:00—Session IV: Energy analysis and the policy process

What is the reasonable time-frame for different types of analysis? What are the conflicts between timeliness versus accuracy?

To what extent have expectations been that analysis will actually make a policy decision as opposed to providing information on which a policy decision can be based? What is the real role of energy information in the policy process?

How should a central information agency like EIA allocate its time among its data collection and reporting requirements such as the annual report, longer range analysis and modeling activities, and short-term response to analytical requests?

Initial speakers:

Lincoln Moses, Administrator, Energy Information Administration;

Denny Ellerman, Director, Policy Analysis and Evaluation, National Coal Association, formerly Deputy Assistant Secretary for Policy Analysis, Department of Energy;

James Sweeney, Director, Energy Modeling Forum, Stanford University; and

Walter Schroeder, Assistant to the Chairman, Federal Energy Regulatory Commission, formerly professional energy staff, House Commerce Subcommittee on Energy and Power.

4:45—Summing up: Loren Cox, Moderator

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Appendix B

List of Participants

Moderator

Loren Cox, Executive Director, Center for Energy Policy Research, Massachusetts Institute of Technology.

Participants

Barbara Bailar, Associate Director for Statistical Standards and Methodology, Bureau of the Census, and Member, Professional Audit Review Team for EIA.
Hank Banta, Professional Staff Member, Senate Committee on the Judiciary.
Paul Basile, Professional Staff Member, Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce.
Elmer Biles, Senior Economic Adviser and Coordinator of Energy Statistics, Bureau of the Census.
Douglas Bohi, Senior Fellow, Resources for the Future.
Ben Cooper, Professional Staff Member, Senate Committee on Energy and Natural Resources.
Larry Drew, Staff Geologist, U.S. Geological Survey.
Anna Duncan, Economic Modeling Analyst, American Gas Association.
Denny Ellerman, Director, Policy Analysis and Evaluation, National Coal Association.
Shelley Fidler, Legislative Assistant to Philip Sharp.
Karen Forcie, Director of Statistics, American Gas Association.
C. Roger Glassey, Assistant Administrator for Applied Analysis, Energy Information Administration.
Josh Gottbaum, Executive Assistant to Alfred Kahn.
Nelson Hay, Director, Policy and Economic Analysis, American Gas Association.
Thomas Hogarty, Senior Economist, American Petroleum Institute.
Connie Holmes, Vice President, Economics and Statistics, National Coal Association.
Thomas Jabine, Statistical Policy Expert, Energy Information Administration.
Lionel Johns, Director, Energy, Materials and International Security Division, Office of Technology Assessment.
Robert Kalesh, Director, Gas Supply and Statistics, American Gas Association.
Alvin Kaufman, Senior Specialist in Mineral and Regulatory Economics, Congressional Research Service.
Ronald Kutscher, Assistant Commissioner, Bureau of Labor Statistics; Member, Professional Audit Review Team for EIA.

Albert H. Linden, Jr., Deputy Administrator, Energy Information Administration.
Lincoln E. Moses, Administrator, Energy Information Administration.
David Montgomery, Deputy Assistant Secretary for Systems Analysis, Office of Policy and Evaluation, Department of Energy.
David Munro, Senior Staff Economist, Council of Economic Advisors.
David Nichols, Professional Staff Member, Senate Committee on Governmental Affairs.
J. R. Norsworthy, Chief, Division of Productivity Research, Bureau of Labor Statistics.
Jimmie Petersen, Assistant Administrator for Energy Data Operations, Energy Information Administration.
Frank Potter, Staff Director, Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce.
Lillian D. Regelson, Assistant Administrator for Energy Systems Support, Energy Information Administration.
David Root, Staff Geologist, U.S. Geological Survey,
Richard Rowberg, Program Manager for Energy, Office of Technology Assessment.
Paul Sauer, American Petroleum Institute.
John J. Schanz, Senior Specialist in Resource Economics and Policy, Congressional Research Service.
Walter Schroeder, Assistant to the Chairman, Federal Energy Regulatory Commission.
Charles S. Smith, Assistant Administrator for Energy Information Validation, Energy Information Administration.
James Sweeney, Director, Energy Modeling Forum, Stanford University.
Michael Telson, Energy Analyst, House Budget Committee.
Michael Tinkleman, Energy Analysis and Environment Division, Electric Power Research Institute.
Kevin Walek, Profssional Staff Member, Senate Committee on Governmental Affairs.
Robert Weiss, Central Intelligence Agency.
Michael Woo, Energy Research Analyst, Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce.
David O. Wood, Associate Director, Energy Laboratory, Massachusetts Institute of Technology.

Appendix C

Statements by Initial Speaker in Each Session

session i: energy data collection

The comments of the initial speakers in each workshop session are shown below. These statements were taken from the workshop transcript, and reflect lightly edited texts which have been approved by each speaker.

Jimmie Peterson, Assistant Administrator of the Energy Information Administration for Energy Data Operations

The overall energy needs of Congress and other users are basically defined in the voluminous legislation, rules and regulations issued since 1973. However, these are redefined as each new area of concern is identified.

The embargo of 1973 marked the beginning of a recognition of an energy problem in the United States. Even though previously domestic crude oil production had been declining steadily since 1970, and even though environmental concerns were imposing constraints on utilization of existing sources and installation of alternatives to petroleum, we had previously refused to face the energy problem. Even immediately after the embargo, there wasn't an energy problem, there was a problem with crude oil supplies, more specifically imports. Much of the current problem continues to revolve around petroleum, whether it is with imports, domestic crude production, refinery production of heating oil or gasoline, product prices, refiner-distributer-retail margins, or any other facet of the petroleum industry. There are, however, a number of other energy sources which could be better understood if we were to take the time now to examine them and plan for the time in the future when we will need the reliable information necessary to address the questions which will occur at that time.

We in the government are still trapped, however, by the emergency-of-the-day syndrome. It's only through a conscious effort on our part to direct or redirect resources away from that entrapment that we will be able better to understand the questions, and hopefully provide some answers, in a timely and credible manner in the future.

Indeed, even though we are trapped by this emergency-of-the-day syndrome, some significant efforts have been made to understand major facets of the petroleum industry. The oil and gas reserves study, financial reporting system, and significant improvements in the basic data and forecasting efforts are taking place within the current EIA. It's my belief that only through a calm, reasoned interaction among all of the parties concerned, trying to understand an admittedly very

complex problem, can the overall needs be identified, prioritized, and translated into viable data information programs, which can in the future be presented in an understandable and timely manner to address the problems of that particular day.

I'm counting on this meeting to be one among many first steps, which will help address some of those problems which have led to this session.

EIA has the authority to collect any data that anyone would ever want to collect, assuming it exists or can be developed and measured. The utility of the answer, and the relative priority of the question, are the major questions that must be addressed before any significant and very expensive data accumulation efforts are undertaken.

The requirements for collecting energy data are really not that much different from those for other types of data. The highly charged atmosphere, and the unbelievable complexity of the physical and financial integration and dispersion of energy industries and issues, are what make the problem difficult. Added to this fact is the fact that energy is intertwined with every segment of the economy.

Finally, we believe we could do a better job, more efficiently, if we could gain access to some major sampling frames, such as the census SSES and the BLS unemployment insurance files. We are unable, at this time, however, to provide either agency with the assurance they need that we could hold confidential this information, because of the Department of Energy Act mandate that we have to share all of the information in our possession with other parts of the DOE. As a result, we're forced to try to duplicate, in a very short period of time, that which some of our sister agencies have developed over a number of years.

Michael Telson, Energy Analyst, House Committee on the Budget, and Staff Coordinator, Speaker's Task Force on Energy

I would like to discuss a few problems that I have encountered over the past year, while addressing the question of what data Congressmen need, particularly in the context of a very volatile political year regarding issues of energy supplies and prices.

The kinds of information needs that came up over the past year were, I hope, very particular to the pressures that were occurring at the time. There was a need for very quick understanding of trends, of what supplies would be available, what prices might be, and we also needed a fairly reasonable forecasting capability. We did not necessarily expect that the forecast would be accurate, but we had to at least identify what the key variables were. Specifically, there were three instances when the Speaker's Task Force on Energy in the House felt that it needed to explain to the Members of the House what kinds of things were occurring, what the Members could expect, and what they could tell constituents.

One of the three instances I would like to raise occurred in June of 1979, when there was the spectacular amount of confusion in public discussion about the gasoline shortages. In particular, there was great dismay that gasoline shortages were occurring, even though

imports were actually above the previous year. We could not find a simple explanation that was relatively intelligible to people as to why this obvious divergence of data had occurred. I think we all feel more comfortable with those explanations now. But in June, there was no satisfactory explanation of what was occurring.

Second, over the summer, there was a tremendous need for understanding on a week-to-week basis, whether we had a reasonable shot at attaining a sufficient level of distillate inventories, high enough to assure that there was a relatively soft market, and sufficient supplies for the winter. There was a lot of concern that we did not know on a week-to-week basis whether or not we were showing promise of meeting that objective or not. The political repercussions of not meeting that target included the strong pressure to reimpose price controls on distillates, which probably would have been done if we did not have some assurance that we were moving in a proper direction.

Third, in November, when the hostages were taken in Iran, there was a very quick need to ascertain what the implications for oil supplies and prices would be for the United States if Iran discontinued its exports here, or cut back its production. Interestingly, when we asked DOE to respond to us in a fairly quick manner to what the situation looked like, they just could not do that on a quick basis. It was very difficult for them to move off what is known, and to start speculating on what might be if certain things changed.

Finally, prior to Christmas, when the Congressmen went home, you might recall that there was a lot of fear that gasoline shortages might crop up, both at Christmas and in the Spring. We needed to be able to let people know in fairly simple terms what the major risks were, so at the very least Congressmen could tell their constituents what they could do something about, what they couldn't do anything about, and why it was that events that seem so far away had a lot to do with gasoline supplies at home. You might remember that, as recently as June, something like over half the American people did not know we were importing any oil at all from abroad.

In general, the needs of Congressmen in speaking to their constituents about energy problems are very different than the kind of problems that we talk about as professionals in energy data. We found that there is a big gap of being able to translate from one set to another. And despite the best of intentions, we were not helped very much by DOE, or by EIA. We've had to—and we've started—develop our own capability to respond in very simple terms to these needs. For example, the Congressional Research Service has been very helpful in putting out data which is easier for Congressman to relate to in that role. I think I'll end my comments at this point.

Ronald Kutscher, Assistant Commissioner, Bureau of Labor Statistics

As a member of the Professional Audit Review Team, I have in the past been party to criticism of EIA for their errors both of omission and commission. But today I want to address the problem of energy data from a different perspective—the conflicts that I think exist in

the mandate given to EIA that makes their job difficult, if not at times impossible. I'll focus on three types of conflicts which I perceive.

First, there is the conflict between collecting data for regulatory purposes and collecting data for statistical analysis. I think these are not compatible, and they are not compatible for several reasons. One, often collection of regulatory data precludes sampling, because you need observations on the entire universe. Two, you get a great deal of conflict between the need for macro and the need for micro data. You want macro information to give a summary of what's going on in the economy. But if you collect data for a regulatory purpose, you need to know exactly what every unit is doing, to see if they are in compliance with the law. The conflict between regulatory and statistical data is that, statistical data requires a regular reporting frame and consistency over time, so that one can analyze problems from a historical perspective. Regulatory data does not need that focus, because as the law changes you may want to change your reporting format to make sure that units reporting are in compliance with the law.

The second conflict, I think, may in some ways be directly related to the regulatory/statistical conflict, and that is the conflict on data sharing which Jimmie Peterson touched on. The idea of sharing micro data is very defeating of a valid statistical program. The mandate that micro data must be shared with regulatory agencies and with the Congress, I think, puts EIA in conflict with their goal of developing good statistical data over time. This may cause problems especially with the timeliness of data because if data may be used for regulatory purposes, respondents will in many instances want legal advice in data preparation, thus delaying greatly its submission.

The third conflict I see is something that I will call the expectation conflict. If one carefully reviews the mandate of EIA, I would say that their mandate is to greatly expand the data base about energy, to define the concepts to do that, to validate its accuracy, to analyze and forecast the changing values of these data, and to do it all immediately. This would be roughly the same thing as having mandated by legislation for Simon Kutnitz and his associates to have developed the concepts of national income, to validate all the data that goes into it to forecast their values, and to do it immediately. And I would argue therein lies a lot of the conflict about energy data and about the expectation that many have of EIA.

SESSION II: ASSURING DATA QUALITY

Charles S. Smith, Assistant Administrator of the Energy Information Administration for Energy Information Validation

I'm Charlie Smith from the Energy Information Administration. I took the Validation job a couple of years back. We in Validation are trying to look at data quality assurance in a very formal way within the EIA organization. It's given us what may be a unique opportunity to look at the quality of energy data, and it's given us a perspective which is probably heresy—namely that classical verification and auditing is probably the least important thing that we do.

We've found that the real problems we see in data quality come from the difficulty of, first, clearly identifying the real needs for data; second, defining the terms and phrasing the questions that respondents

can answer, using data that they have, so that they actually address the questions we are trying to answer; third, isolating and identifying the respondent population. [I think you've heard enough about our frame problems to know that they're real—I persist in finding this in regulatory as well as statistical data collections]: and fourth, in identifying the errors that we induce as we process and aggregate the data. These problems relate to the design and operation of the data collection. We've found that better design of our collection instruments and improved frames contribute far more to data improvement than does company audit.

In fact, we find a shocking tendency on the part of our respondents to be honest, even when it's to their own disadvantage. Of course, verification is needed, but verification can be very usefully done, even for regulatory collections, on a careful statistical basis, with sampling.

An example of a verification that our office has been conducting is the field validation of proved reserves of oil and gas estimated by the oil and gas information system on the basis of data collected on Form EIA–23. In the course of this effort thus far, we have independently estimated 41 percent of U.S. crude oil reserves and 30 percent of U.S. natural gas reserves. We've selected the deposits whose reserves we would estimate independently by means of a stratified probability sample of oil and gas fields. At the end of a year's work, we believe, with considerable mathematical assurance—and frankly, the seat of our pants believes it too—that EIA's aggregate estimates on oil reserves are accurate with bounds on sampling error less than 15 percent.

Our full three-year program will enable us to tie down all of the statistical loose ends and cut those down by a factor of at least four.

This has been a difficult and an expensive process; it's required the use of many of the petroleum engineers and geologists in DOE; the U.S. Geological Survey has also contributed significantly to this effort. However, in spite of the fact that we have been verifying a number that has been considered to be highly controversial, it should be noted that the principal causes of errors we found were not intentional misreporting. They were problems with the frame lists of oil and gas operators in some of the less important petroleum-producing states, such as Kentucky. And they were problems with understanding of certain of the definitions. For example, what is a "behind-the-pipe reserve," and how should it be described in answering the form?

The individual responses were surprisingly consistent with the numbers which we generated independently when we went back to the rawest of geologic source information. I suspect that the biggest problem that we'll have with the survey is that we asked the question we were told to ask, which was the question of oil and gas reserves, and I suspect that people will try and interpret that not as oil and gas reserves, but as recoverable resources.

Another question is one of direct collection of energy data. There are certainly some who feel that EIA needs to do more direct collection of data rather than asking those who hold the data to respond to questions. For example, one of the images we often have is the request that we do out and strap and dipstick tanks to determine the exact petroleum stocks. In a recent report presented to the House and Senate Appropriations Committees, we estimated that to directly collect a

minimum amount of secondary stock data would cause EIA's annual budget to increase to about $2 billion per year from a base of $100 million. We don't believe that taking such a step would result in significantly better data.

As a data validator, whatever that is, I would add one thing to the previous discussion. It is just plain hard to do a good data collection, whether it is statistical or regulatory. If you can combine them, you only do one, that certainly reduces the number of hard problems you have to address. I think I should observe that I have seen just as much difficulty or more in the regulatory collections as in the statistical collections, and of the same flavor.

The regulatory agencies that started the collections or the activities that started the collections often had as hard a time getting the questions that they needed to have answered straight as we seem to have problems getting the questions we need to have answered on our statistical collections straight. They have just the same problems.

Michael Woo, Energy Research Analyst, Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce

Assurance of the quality of data and data analysis is like motherhood and apple pie; everybody agrees that it's a good concept, and Congress supports it. However, I think you have to go a little bit further than that, and look at the need for credibility. Let me give you a few examples.

In my experience there is an underlying suspicion in Congress that there are problems with EIA data. Whether these suspicions are founded or unfounded, I don't know, but we'll get into that later. Either data comes from oil companies, such as data from API, which until very recently was the basic data source for Weekly Petroleum Status Report, or if the data comes from EIA, there are questions about its accuracy, its usefulness, and it's timeliness.

One of my own experiences in this area was trying to analyze the gasoline shortfall in the summer of 1979. This wasn't analysis which went on at the time, this was analysis which went on after the event, later in the fall and in the winter, and I'm still trying to figure it out. I had trouble even gaging the size of the shortfall, let alone the cause. Depending on the EIA data system used, variations ranged from zero shortfall to 10-percent shortfall in the month of May of 1979. The system differences and the inherent variations were just about as large as the shortfall I was trying to analyze.

This raises clear questions about, not only the quality or the accuracy of the data, but its usefulness.

On the other hand, Congress seems quite willing to write specific findings into energy legislation, which tie results to specific findings based on energy data. For example, the 20-percent shortfall finding in gasoline. If I can find a variation of plus or minus 5 percent, what sense does it make to make a 20-percent shortfall finding?

Thus, assuring the credibility and knowledge of the extent of credibility is a very necessary function. I think the question that has to be addressed is, how has data validation actually implemented this particular mandate?

During the last year's authorization of EIA's budget it became quite clear that the validation effort was not measuring up to the goal. The startup of the validation effort, and the exponential growth of the organization, caused problems of quality in the administration of validation which I hope will be corrected.

Key to carrying out its function of evaluating the quality of data and analysis is that the data validation itself be credible, or at least be perceived as being credible.

I have two suggestions. One, I think each system should really go through a general evaluation of its mandate, and come up with a clear enunciation of the problems in each system, in terms of its accuracy as well as its usefulness.

My second recommendation addresses the problem of reliance on industry data. You need to assure credibility, and I think this is where you need the verification and audits that Charles Smith was talking about. It doesn't even necessarily have to be done on a full basis, but it needs to be done on an on-going basis, probably at least on a sampling basis.

Barbara Bailar, Associate Director for Statistical Standards and Methodology, Bureau of the Census

I'd like to discuss several major concerns in the assurance of data quality. The first of these is a distinction between talking about the assurance of quality as verification or evaluation. Verification we think of as an accounting or auditing procedure. Evaluation we think of in terms of evaluating an entire statistical system. Again, this comes back to that same split, whether you're talking about regulatory functions or statistical functions. Those interested in regulatory functions talk mainly about verification, those interested in statistical operations of data collecting talk about evaluation.

Second, I wanted to discuss some of the problems of staffing for verification or evaluation; third, the kinds of reports that would be issued; then the commitment of the agency to use the results; and finally the verification of data collected by other agencies which raises some concerns.

Evaluation of a statistical process treated as a statistical function is much more likely to find problems that affect the data, then validation treated as an auditing procedure.

Let me give you some examples. Right at the very beginning of almost every evaluation activity there is an effort to find out a clear statement of survey objectives. Sometimes there is ambiguity concerning the purposes of the collection system. Where that ambiguity exists, you're going to find troubles all along the way.

Another problem arises when you have to start evaluating the survey instrument, the questionnaire itself. There may be difficulty about translating concepts into operational definitions. One of these, for example, was that the definition of a petroleum refinery was very difficult to apply, and people were interpreting it in different ways. Thus under-coverage or over-coverage of refineries could result. We have found at the Bureau of the Census that there is a great need for pretesting these definitions and questions. The wording, the order of the questions, all of these things have to be looked at. The whole data gath-

ering process needs to be studied. Why do you use mail forms? Are you really collecting most of your information by mail, or do you finally telephone the respondents and tell them that you really need a number and you need it fast? How do you know what kind of number that they're giving you and what kind of sources they use to get that number? One of the evaluations that we did at the Census Bureau found out that when you press people to give you answers under a short deadline that the early reporting on those data may not be as good as the data that you get when people have had a chance to review their books and give you those figures.

The whole idea of whether you have mandatory versus voluntary data collection is important. You get different kinds of concerns for each one. How do you calculate your response rates? Of course, in mandatory surveys one hopes for 100%, but I doubt that you get it.

And then you have to evaluate your data for consistency, reliability, and bias. In the data processing operations, there is another chance for error to creep in. And then, finally, in the reporting of results from the data collection system there are many evaluation questions—how the data are interpreted, what the accuracy assessments are, are the inferences justified and the impact of nonresponse and other biases.

Now I'd like to turn briefly to what kinds of staff is needed for evaluation. We have found that you need a lot of different kinds of people to do this. First of all, you need program people who actually know what kinds of data are needed, and what some of the problems are. I would imagine in EIA's case you'd need some engineers, some geologists, and so forth. But you definitely need statisticians involved in this, because this is a statistical enterprise. You need them to evaluate survey design, sampling, questionnaire experiments, data collection, estimation, and so forth. I might also say that you might benefit from using psychologists. They are very good at telling you what's wrong with your questionnaires.

There are different kinds of reports that can be issued from an evaluation process. One can issue a very general kind of report, describing what was assessed. That's more or less the kind of report that I have seen from EIA. Another alternative is to take the results of a sample of survey respondents, interview them in depth, and inflate the results of these cases to the estimates of the total. Then a comparison can be made with the original survey. This would provide information on where you got shortages, where you got over-reports, and so forth. This is more the kind of evaluation we've done on our surveys at the Bureau of the Census.

Then you also have to state the potential effects of nonresponse. Finally you have, in most data system evaluation reports, a large section on recommendations on improvement. The recommendations on improvement can come in many areas. I notice that the EIA evaluation reports mostly center on improvements of the survey questionnaire. That is the most obvious place to start but improvements may be more useful in the estimation procedure, in processing, or in refining definitions.

Another very important part of the whole evaluation process is the commitment of the agency to use the results. Are any changes made as a result of this whole process? One can think of evaluation as a

chance to educate respondents. When you actually go out to do this evaluation, if you approach it from the point of view that the agency is trying to learn whether this is a viable means of collecting data, your respondents will generally open up to you, because they think they're helping you, that you aren't just there to investigate them. There's a tremendous amount that can occur between respondents and agency survey-takers that educates the respondents on what you want to get out of the survey. You may then see changes occurring in the kinds of reports that you're getting from the respondents. In all of this, the involvement of the data users has to play a big part.

Now, as far as data collected by other agencies for EIA, Census is one of those that does not go along with EIA having full and complete access to our records for evaluation. It is very clear to us, that this is against the laws under which we operate. However, it seems to me that there are other ways that data collected for you by other agencies can be verified. One way is by writing right into an interagency agreement that you want that agency to carry out verification for you. We have done this routinely for other agencies, and though we don't make the records available to the agencies, they certainly get the results of all the verification that we do. And at times Congress has written this into legislation that we carry out. For example, the large Survey of Income and Education that we carried out mainly for the HEW—built right into the legislation there was a clear statement that verification was supposed to be done. So it seems to me that you don't really have a problem. All you have to do is make the money available to the other agency to carry out evaluation for you.

SESSION III: ENERGY ANALYSIS AND MODELING

C. Roger Glassey, Assistant Administrator of the Energy Information Administration for Applied Analysis

I'll try to scamper briefly through the somewhat formidable list of questions on the agenda.

How are analytical needs defined? Well, the short answer is by the nature of questions that we get asked, or that we think we may be asked in the future. These questions may be posed by us, that is to say by the analytical group within the EIA; more often, they are posed by our clients, the Department of Energy or Congressional staff, or the Administration.

Recently, we started a comprehensive study of energy policy for a congressional committee. This has caused us to think fairly carefully about what might be the sorts of questions we'll be asked in the future, and it's been a very enlightening experience. One of the constantly recurring dilemmas on this matter of the analytical needs is the question of how much detail is necessary. It's very understandable why a Congressman would be interested in what the effect of a policy might be on the dominant two or three industries in his congressional district. But the cost of collecting data and doing analysis at that level of detail is perhaps one, maybe even two, orders of magnitude greater than the current budget for EIA. So part of the question of detail is almost de facto answered for us by what resources we have available. As Jimmie Petersen said, you can collect data about anything if you're willing to pay the price for it—or almost anything.

I believe we are much better served by focusing our attention on broader issues at higher levels of aggregation rather than continuing to pursue the will-o-the-wisp of ever finer detail in analytical questions.

So how do we set our long-term goals? Well, simply by trying to understand better what are the long-term issues. In the first place, an issue, I think, is something which, unlike a problem, does not admit of a solution. An issue represents a long-term value conflict within the society, or within the body politic, that is not going to go away quickly just by a technological fix or a brilliant policy stroke. For example, I think THE energy issue—pardon me for boring you, you probably all know this—THE energy issue is how do we manage the transition from the era of cheap, clean, abundant energy to the era of increasing real costs for all sorts of energy resources. The de facto decision was, we manage this transition within the United States by relying on cheap, abundant foreign sources. We have discovered that these cheap, abundant foreign sources are not as reliable as we would like them to be, and no longer as cheap as they were.

So one issue, then, has to do with the tradeoff of cost against reliability on the supply side. It would be far more reliable to rely on our own resources; but the cost might be higher than the cost of importing.

There is a subsidiary issue, then, on managing the transition, and that is: what can or should the Government do to increase supplies and reduce consumption? The Government has lots of policy instruments available to it. It can spend money on research, demonstrations, and development for fuels and electricity, on mechanisms for using energy more efficiently, and on exotic sources of supply. It can provide incentives, taxes, regulations, to influence the behavior of the private sector, to use less or use different energy sources, produce more, or produce something different.

So when the question of the relative effectiveness, or the cost-effectiveness ratio of different policies is the focus of analysts, then we have to be quite specific about what are the policy instruments, which sectors are the objects of them. Now, for me to understand how we should prepare ourselves for the next five years gets to be a little bit difficult. I think I understand what the general issues are, but what specific policy instruments, and the spheres of applicability of the instruments, we'll be asked to look at is a little harder to sort out.

There is a third enduring issue here, and that has to do with the question of equity or wealth transfers. In other words, which sectors or segments of the economy bear the pain and which reap the benefits from the changing circumstances on the energy front? Let me give you one particular example: one government policy is to encourage pricing energy to the consumer at its replacement cost, so that consumers will make intelligent choices between burning it less or burning it more efficiently, or installing insulation, or whatever. This policy, however, is smack dab in conflict with the policy of keeping inflation down, of protecting the poor and the middle income groups—or anybody—from seeing higher costs. There also is a de facto policy about not letting the large energy concerns make what's conceived to be too much money. And I don't think that that kind of an issue, of how much money should flow to the large energy concerns and away from the rest of the economy, is going to go away and to be settled easily by a brilliant policy stroke.

Another enduring dilemma is the tradeoff between the cost of energy and the quality of the environment. No one in this room, I'm sure, believes that it's possible to have both cheap energy and a clean environment simultaneously. Anything you do to improve environmental quality is going to run up the cost of energy, and in my more depressed moments I don't see any effective mechanism for even debating this issue intelligently, much less coming up with a plausible resolution.

Now, another item on the agenda has to do with energy-economy interactions. The greatest challenge there is to understand better the substitution possibilities amongst fuels, and the substitution of energy for capital or labor or other inputs to the economic process. We are still hampered in that understanding by the fact that it is difficult, as has been mentioned at least three times today, to match our energy data collection series against other measures of economic activity collected elsewhere in the government. Because, regrettably, EIA does not define sectors or products in the same way that the BEA does, or the BLS, or other people who are involved in the economic statistics games. We don't even define sectors the same way within different data series within EIA, much less consistently with everybody else.

What sort of analysis is needed for policy? Well, I've sketched what I think are some of the long-term issues, and there is again the question of how detailed is the policy to be—and that indicates the level of detail you'd like the analysis to be at. But let me point out that when the policy deals with the minutiae of the operation of the energy sector for example, if you're asking about a 10% tax credit for the plastic relocatable solar panels for retrofit, what's that going to do to oil imports, then, the policy analyst merely has to say, "very little" (laughter). Which may not satisfy the proposer of this particular amendment, because it is his constituent that makes these things. But nonetheless, that's about all a policy analyst can say.

What are limits on modeling? Well, one obvious conclusion is that if you don't have any data, and simultaneously you don't have any theory, you cannot do a model. And anyone who attempts to do modeling lacking both data and theories simultaneously shouldn't be taken very seriously.

It is sometimes useful, however, to construct some models even if you don't have all the data you would like to have—which is where we always are when we try to construct models—because frequently the modeling exercise can tell you which variables are significant in the answer and that information could be very useful in designing the data collection system, among other things. However, as modelers we have an obligation to be very clear in our explanations as to which of the model inputs were data, reasonably well validated, and which ones were guesses, and what effect the guesses have upon the answers. The trouble is, it takes many pages to describe all this, and fairly patient reading on the part of the users to understand all this, and so we do have a communications problem.

There are certain areas in which I don't think modeling is worthwhile attempting at all, and that is when the crucial question has to do with predicting the future behavior of a political or regulatory body. As an example of this difficulty—one of the points of criticisms on our last annual report energy forecasts was aimed at the projected rapid shift of the electric utilities out of oil and into coal under a high

world oil price. It turns out this is the cost-minimizing behavior for a utility. However, it may not be the behavior which the decision complex consisting of the utility and the PUC's and the air resources board and the state siting board will finally come to. Our ability to predict the way that complex of decisionmakers will act is really not very good. We think we can compute what a cost-minimizing behavior will be, but predicting the way in which regulatory and enviromental constraints will act to inhibit cost-minimizing behavior defies the ability of the current state of the modeling art, and may even defy man's ability to understand.

Now, what is the role of other types of analysis? In the first place, I suspect that if you don't have any theory and you don't have any data, no other type of analysis, including modeling, is going to do you any good either. It may be interesting to write essays, and philosophers have done that for a long time, and that may be of some guidance. But I would argue that there is no such thing as analysis that proceeds without the use of a model. The only question is, how explicit is the model? Is it all written down, does it take mathematical form, is it incorporated as a computer program, or is it a mental model, a worldview of the guy doing the analysis, which may or may not be explicit, may or may not be all written down. But analysis, I argue, cannot be done without a model. The only question is, how specific, how detailed?

We have a certain tendency to try to build upon the accumulated intellectual capital of the past. If an analysis is done by use of a model which is sufficiently formal to admit of a mathematical representation and then translation into a computer program, at least we have a chance to verify whether the arithmetic gets done right; there are other things in the model that are harder to verify. There is a tendency to want to use that piece of intellectual capital, rather than invent it all over again. Now, that tendency can sometimes be perverted to the point of recasting the question which was asked in terms that can be answered with the available stock of modeling apparatus. And that's a trap we would like to try to avoid dropping into.

Let me close by coming back to the question of mismatch of expectations, which was mentioned earlier. I suggest that there's another aspect of expectational mismatch—we're sometimes victimized by the notion of uncertainty, and who has got to take the heat. The future is always uncertain, no getting around it, and the effects of policy choices are always to some degree uncertain.

The policy maker would like to avoid the very difficult situation of having to make decisions while not knowing precisely what's going to happen. So he asks some analyst to tell him what will happen. That's a very desirable, very understandable point of view. The policymaker, the Congressman who has got to vote, would like his staff to be able to tell him, if I vote this way, what will happen to unemployment in my district? He'd really like to know that answer, and is understandably very disappointed when the answer comes back, "Well, we can't tell—maybe it will go up by 2½ percent, or drop by 6 percent, or maybe go up by 10 percent and that's the range of uncertainty; we really don't know."

I would suggest that one distinction between staff analysts on the one hand and decisionmakers on the other is that the decisionmaker's job

description calls for him to be the uncertainty absorber in this situation—not the staff analyst. The staff analyst can try to define what the range of uncertainty is—what's known, what's not known, what you might plausibly deduce, and what you are never going to know. And that's as far as his responsibility goes. Sooner or later the guy who wears the hat as the decisionmaker, whether it's the Secretary of Energy, or the President, or the Congressman who votes, is just going to have to say. "Okay, I don't know, there is this uncertainty, and my job calls for me to make the best decision I can under the circumstances?" It's a very uncomfortable situation to be in.

So, part of the dilemma that EIA is in is that we are occasionally asked by decisionmakers to be the uncertainty absorbers in the game, to impute more precision to our numbers than is warranted, thereby giving the person that has to make up his mind how to vote a greater feeling of warmth than he is really justified in having under these circumstances.

Ben Cooper, Professional Staff Member, Senate Committee on Energy and Natural Resources

I'd like to bore you for about two or three minutes with a story that comes out of my own background, but which I think has some analogies for data collection. I started out in life to be a physicist, and when I went to graduate school, they had this wondeful thing that was called a computer. I think it was probably fairly new in terms of the ability for the average graduate student to access it in the early '60s. And one of the things a computer enabled you to do was to try out a lot of possibilities that you couldn't otherwise do because it took too long to do all the arithmetic.

This led to the rise in theoretical physics of a whole branch of physics called phenomenology. With a computer, you could try lots of possibilities, and see which one worked better.

But after this went on for several years, it was noticed that when people were involved in this area, they didn't end up understanding very much about what was going on, although they could fit curves very well. And it was a time at which some people raised the question of what the whole game was really about.

I'd like to jump from that to some of the expectations which I think we had in the early part of the career of the Energy Information Administration and, really, its predecessors in the Federal Energy Administration. I think we had a hope when we started out with the legislation—you can read some of these grandiose hopes and the impossible tasks set for the Energy Information Administration in their statutes—that here was a situation in which we had a number of relatively complex phenomena. There was a hope that by gathering lots of data and trying to manipulate it so as to fit certain kinds of curves or fit certain kinds of predictions, that we would come to understand more about how energy was used in the society and more about what to do to help the country get through a very bad, deteriorating situation in which we were going from cheap, plentiful energy to much more expensive energy. The thought was, well, the way to get at this is to

get some numbers and try to make the numbers explain to you what is happening. So we have set up a big effort at doing this in a quantitative sense. And I think we've been through the period of phenomenology now, where we have built relatively large and complex models—which we have used; I think the President by and large walked into a tremendous, wrenching, very painful experience with the National Energy Act, largely because he believed the result of some of these models. I think it's time now that we look back and try to see if we haven't gone as far as we can towards complexity and move back towards simplicity and try and figure out what these models are really trying to tell us and what we learn from them.

Lincoln Moses, in a speech about a week or two weeks ago gives four to five pieces of advice about energy modeling and how you think about them, which I would like to kind of share with you here. I think these things tell us about some of the directions we ought to be going in.

First of all, one of the things he points out, and I think this is very true, is that it's much easier to believe the information that is told to me from two different forecasts, if you're only asking me to look at the difference between something they predict, and not asking me to believe the absolute value of either forecast. That way you lose a lot of assumptions and errors. And I think in many regards we ought to focus more on how some key output variable changes between two different ways of looking at the system, rather than trying to build a large descriptive system that will tell us how the universe works.

I think we're beginning to realize that there is a law of diminishing returns in making models, and I think even people in Congress realize that it's fruitless to get changes in the third decimal of the four-digit SIC in a Congressional district or something like that. So that maybe going to another level of disaggregation in our way of trying to describe the world is really not going to buy us much more knowledge and is going to create an immense amount of effort.

One of the questions that I would raise about the way we look at models, and the way we look at analysis of energy policy in a quantitative sense, is that it seems to me that a lot of this is built upon the theory that most people try and optimize their behavior in an economic sense. I really wonder whether any analysis which is really based on that is much use. I think people probably optimize with respect to a lot of things, and once you get through the list of those things, you wonder whether it makes any sense to try and deal with them quantitatively. I'm sure that the people who determine how much oil is produced in Saudi Arabia are concerned with their revenues, and they are concerned with how much of the market they have, and where their oil goes, whether it goes to the European market or the American market. But they also optimize with respect to their expectations about the PLO and Russia and the United States and optimize with respect to a lot of feelings that I don't understand. Any mathematical model I write about these people, I think, is going to leave most of that out, and I don't think it's going to tell me very much.

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I think we ought to try and look at what are the key variables, and make the output of the models a direct function of the uncertainty of the key variables, and quite often we don't do that.

So I guess what I'm saying here, is that one of the things that we are in danger of losing sight of that the aim of this game is to understand in relatively simplistic terms, if we can, how things change when you change basic parameters of energy supply and demand. And so we ought to be going towards a lot more simple and elegant explanation for things. That's very hard to do. It's much easier to get a more complicated curve-fitting mechanism and run that, because that is easy to do. It's not easy in the sense it is a lot of grind work, but it's straightforward. And really, I think, that's not getting us anywhere. We need to go back to the simpler things.

I think a lot of the problems that we have to face in energy are really foreign policy problems now, and they are more involved in some of the things which are fundamentally unquantifiable, which are not going to be much clarified by the traditional kind of parameteric modeling. The best that energy information. I think, can do for us is to help us dimly perceive how some of these uncontrollable external events are going to affect us. That means we need accurate data and we probably need a lot of it and we're probably going to be short on ways of making it all fit together in a neat theory. I don't think we should worry about that. We'll have to find people—there'll be some smart people come along just like there are physics and chemistry who will show us the connection between these data, and they probably won't use a computer to do it.

So I guess what I have to say is that I'm looking for fewer numbers and more simplicity.

David O. Wood, Associate Director, Energy Laboratory, Massachusetts Institute of Technology

I agree with most of the points made by Roger Glassey, and will emphasize only two concerns which I think are especially important to keep in mind—the essential role of formal modeling for EIA, and the problems of establishing and maintaining the credibility of these models.

First, I agree with Roger that there is no alternative to formal modeling if EIA is to make its analyses transparent and accessible to others. A formal model is nothing less than the organization and documentation of data, analytical procedures, and assumptions linked together in a manner permitting replication by an independent analyst. A model may be a great deal more than this when it provides insights and understanding of complex issues not easily assimilated and manipulated without a formal structure, but its essential feature is that it provides for replication.

Second, while EIA's need for formal models is clear, the factors determining the credibility of these models are complex. I believe that most often the discussion about the use of formal models in policy and analysis, some of which we have been hearing in this workshop, is best

understood in terms of how models and model applications are made credible. There are several points to consider here, including:

The state of our scientific understanding concerning the behavior of consumers and producers of energy, of the relation between consumption production decisions, other market factors, and macroeconomic activity;

Our ability to synthesize and extend scientific understanding in analysis of particular policy issues;

Our confidence in the process by which the modeling and policy research takes place, and in the credentials, objectivity, and competence of the people doing this work.

Of the many ways to view these questions, I find it most useful to focus upon the relation between data and research modeling, the synthesis of data and research results with information, assumptions, and concepts arising from, or suggested by the policy issues, and the process by which modeling and analysis is communicated to scientific peers, policy analysts, constituencies concerned with the policy issues at hand, and, of course, decision makers. First, the data must be credible in the sense that the process by which it is collected, combined into accounting structures, and so on, represents good statistical practice and is well presented and documented. Credibility begins with this, and certainly the attention devoted to new energy data systems by EIA, many of which are mandated by their legislation, testifies to the importance attached to data systems.

Source data determine the extent of applied research including hypothesis testing, predictive experiments and so on. The research process feeds back upon the measurement system, creating needs for new data. How successful has the process been in increasing an understanding of the energy system? As Roger noted, many of the questions we have had about the performance of the energy system—for example, the relation between the availability and price of energy and macroeconomic activity, the supplies of primary energy forms such as naturally occurring petroleum and gas, the development of new technologies, and their pace of assimilation into commercial use—remain with us today, even though the past 7 to 8 years have seen a great deal of research and analysis. While we certainly have learned a great deal, in particular about the nature of the questions we were asking, the pace of new knowledge has probably not been so very great. This is due at least in part to the slow pace in developing new formal data systems, well-grounded in such accounting structures as the national economic accounts and inter-industry accounts. Many of the problems with data systems which were responsive to our national research needs in a pre-expensive energy period are only now being addressed by the EIA. For example the residential, industrial and commercial sector energy consumption surveys, and the petroleum reserves and resources surveys will provide the basis for important new research in the next few years which will increase our fundamental understanding of energy consumption and production, and its relation to economic activity and national productivity.

But although new research results based on improved data and research modeling will improve our understanding, there is no reason

to believe them sufficient to significantly improve our capability to employ formal modeling in the study of the important policy issues. More is required. First, by their nature, policy issues involve value conflicts which, in a social democracy, are resolved by the political process. Organizing and synthesizing scientific knowledge and data to meet the needs of the policy process requires an understanding of the issues. The information needs to aid understanding and decisionmaking concerning the values likely to be in conflict. For policy issues, which derive their importance from the fact that value conflicts and "high stakes" exist, formal modeling may only have a relatively modest role to play, that being to "map out" the implications of alternative resolutions of factual and analytical issues at conflict, regardless of the maturity of the scientific results and data. This modest role is, of course, not to understate its importance, but only to caution against undue claims or expectations.

Even when the scope for formal modeling is understood by the modelers, the credibility of the model results as information for policymaking will depend upon the process by which the models are developed and applied, and perceptions of the objectivity and competence of this process. Credibility of the process is a nebulous kind of thing, depending upon peer review and comment, transparency of the modeling and model application process, perceived objectivity of the effort in terms of reputation of the modelers, and so on. What we mean, then, by the credibility of EIA models and model applications is very complicated, depending upon many very different factors and considerations, including the relevance of existing data and research results, the ability of modelers and analysts to organize and extend these results to support policy analysis, and the real and perceived quality and objectivity of the model and model applications process.

Finally, on a somewhat different note, I'd like to make one comment regarding data. As Randy Norsworthy noted this morning, one aspect of concern about the relation between energy and the macro-economy is the energy-capital formation-productivity linkage. Research and analysis in this area requires, among other things, data on energy use and conversion and use integrated with similar data for other factors of production—non-energy materials, capital, and labor. While the new EIA energy data collection surveys will be important input to such integrated accounts, EIA should begin to work more closely with other agencies in the federal statistical establishment to integrate these data into interindustry accounts which will support research and analysis of such issues as the link between energy and productivity. I have commented upon this issue elsewhere, and simply state here that I do not believe EIA is doing nearly enough in this critically important area of data development.

David Munro, Senior Staff Economist, Council of Economic Advisers

First of all, let me totally swear off on defining simplicity and complexity.

I come from the vantage point of one of the front-running clearinghouses of the big and the quick problems. And what I have to say is

from that vantage point, and boils down to saying that there are two things that are important. The burden of what I have to say is that we are very concerned about aggregates and about comparabilities.

First of all, having access to aggregate data and also to models built around aggregated concepts simply means that one has to juggle fewer jigsaw pieces. And I really want as few jigsaw puzzle pieces as I can get—as few big ones.

Also, the desire to have comparability between data, between concepts, and between models, is understandable, since comparability really permits analytical checks.

How do I define analytical needs? There is a vast catalog of micro Q's and A's about energy, versus a few macro and aggregate questions and answers. And the two sets really have very different kinds of needs, in terms of the analytical backdrops. And the two are not easily married—far less easily than is frequently pre-supposed.

The impacts on the economy at large from energy are large enough to be seen. They're really a big, tall mountain, and not in the distance, either, but very much up front. Therefore, when you are constructing estimates of impact on the economy, you really want an adaptation of the data you're dealing with, the concepts and the models, that will let you compare those results with other known benchmarks that may be first, second, or third degree cousins of the energy problems. Just to give one simple example, an increase in consumer outlays for energy is in some respects like a tax increase. You can transfer some of what you know about tax increases to an increase in consumer outlays if you know what a given regulatory issue or change in prices of oil is going to cost consumers.

If there is a failure to make comparisons with such other kinds of benchmarks, like tax increases, you really can't check on the reasonability of any research that's intended to steer national policy.

Just to give an example of the kinds of problems one runs into: in dealing with energy and macroeconomics, there is one very well known model which gives a person two options, basically, for how to enter a gasoline tax, which I think still remains an analytically interesting issue. One of the avenues will get the excise tax into prices, but it won't take it out of profits or anything else and it won't put it into Federal revenues. The alternative avenue in that model will get it in Federal revenues but won't take it out of profits and won't get it in prices. Obviously, one needs to do something on their own outside of the model to balance the two ways of getting it in.

If you've got a lot of problems like that, with a highly detailed model, you could spend all day, all night, and all week dealing with that nitty-gritty and never get a chance to do one completely independent analysis that will tell you whether the first one was even in the ballpark or not.

In terms of how to understand energy's impact on the economy, for the very broad questions, one's really interested in what does energy do to growth, to inflation, and to unemployment. If you're trying to get through a whole lot of little questions, you may never ever get to see whether those three answers that were really up front, which are the only things that a policymaker may well consume, are off the map or not. What you'd like to do is to be able to test whether the growth, the inflation, the unemployment effects are remotely reasonable.

In order to do these kinds of things, what one needs is a total scale of the income transfer involved, and that requires an impact on the average cost of the resources involved, and on the volume of the resources involved, in total. The base from which this kind of thing starts to happen, is also of importance. Are you starting off from something that is 5% of the economy or 25% of the economy? And knowing that one answer is frequently far more productive than knowing what 100 half a percent answers are that add up to that one big answer. This is one of the places where having a few big jigsaw pieces instead of all the little ones that make it, is of considerable value.

This also lets you judge, in some proportionate sense how big an impact on explosion you're seeing in this one sector today will have on the whole economy. It may be a big explosion in this sector, but if it's a big explosion in the hatpin industry, it's not going to be big on the economy. But if you make an error of two-fold on how big the energy sector is at the outset, that error is big enough that it is going to lead you into all kinds of problems.

Let me say, then, a little about the limits to modeling. I've heard several comments here about the problem of discomfort over uncertainty about model results. The discipline that's involved in model-making, to the extent that modeling simply is defined by disciplined thinking, rather than by simply pushing numbers into a computer, is very relevant, and I basically second them. But, at least at this point, our instruments in the various models, and the data they rest on, are still sufficiently imperfect that it is better to conduct a research strategy that lets you take three or four independent estimates, at least as independent as possible, and use these as suggestive leads on where the others may really be out of whack. This is far better than trying to work through to the 'nth' detail with just one model.

There's just not a prayer in the world that the theoretical ideal model is within grasp in this area, and I doubt it will be for some time.

SESSION IV: ENERGY ANALYSIS AND THE POLICY PROCESS

Lincoln Moses, Administrator, Energy Information Administration

I'm going to say a few words about timeliness and quality of information, and first I'll talk about quality.

I want to divide this discussion into two parts: past information, which is preferably data, and future information, which is forecasts. And the tradeoff between quality and timeliness is not the same in these two domains of past and future.

The quality of data, past information, involves at least the following: that the data be clearly labeled as to its origins and definitions, meaning that the data are not liable to excessive revision in the future—that's the imputation problem I named before; that an indication of the likely accuracy is given; that the data are available promptly; and that the data are clearly summarized and presented.

On the other hand, the quality features of forecasts, or statements about the future—we must remember, there are no facts about the

future—are somewhat similar, but they're not the same. This time, explicitness about assumptions, data, guesses, chosen policy variables, are the needed items. Another feature of quality is absence of errors: in the code, in the numbers, in the text describing the outcomes. There should be a useful indication of the uncertainty—that's a different conception from accuracy, though it's rather parallel. Again, the analysis should be clearly summarized and presented. Finally, there is something else lurking—there should be an "analytic correctness" attached to it. This involves sufficient thought at the beginning of the analysis, and at the end of the analysis, with sufficient attention to (1) the essential features of the problem, and (2) subordination of inessential detail.

Now, I believe that these two lists of tokens of quality are demonstrably different, though there is some overlap. Now I'd like to talk about how timeliness gets into the picture, and once again it's worthwhile distinguishing between the past and future.

The quality of most past data is not necessarily something you have to trade off against timeliness, because for past data, there's a great opportunity for advance preparation to allow you to be timely and accurate. You can make advance preparation and build in quality by assuring that there are sound definitions, that the data has been collected under clear instructions, using good data collection forms, that it's stored in readily accessed files, and that you have an able interpretation staff. You can prepare for all of that in advance when you're dealing with past data. I'm not saying it's easy to do this, but it's possible in principle to do it. (But we must recognize that *very recent* past data consists necessarily, in large part, of guess and estimation.)

For new data systems, there is a tradeoff between timeliness and quality. Because if you put up a new data system quickly, you've built yourself a long sequence of problems that will emerge as you try to use it.

Now, what about the tradeoff between timeliness and quality of future information, or forecasts? Here the role of preparation is less, but it's important. By being prepared, you can have adequate documentation, well-organized files, current data bases, efficient computing programs, and staff familiarity with all this. (Those factors are an important part of the justification for doing our annual report. We get everything updated, we ge everything kind of clarified, everybody gets used to using it, baseline forecasts are prepared, and future questions that come up in the course of the year will be better treated for that preparatory exercise than they might otherwise be.)

But mainly, there is a very sharp tradeoff between quality and timeliness in this forecast area. There are several ways to be timely with a forecast—but most are adverse. You can skimp on formulating the problem. You can skimp on your uncertainty analysis. You can skimp on thinking about the analysis strategy. You can check the data less thoroughly. You can check the code less, write the report hastily, or you can even use teams—one person writes the conclusions and another writes the introduction, and somebody else writes the analysis. These things save time, but they spell a tradeoff of quality for timeliness.

Finally, in the forecasting area, timeliness can be eased by using the simplest available models that will do the trick, rather than more elaborate ones. It is possible that quality as well may be enhanced by use of simpler models, sometimes.

James Sweeney, Director, Energy Modeling Forum, Stanford University

Since the title of this session is "Energy Analysis and the Policy Process," I'd like to comment on the role of an organization like EIA in the interface between analysis and policy.

There are several analysis functions—and I strictly say analysis, not necessarily modeling, because analysis includes activities that we don't necessarily include in modeling—several analysis functions that could conceivably be performed. Moving from the least to the most controversial: first, EIA could provide an overview of the decision environment—possible world oil prices, possible imports, and so forth.

Second, EIA could help to develop an understanding of the impacts of broad policy motifs. EIA could examine some of the broad policy directions that may be adopted in the future, and could analyze the impacts of various policy options.

Third, such an agency could conduct analyses of the impacts of very specific policy options, or a range of policy options. It could also help the people involved in the policy process ask better questions, by interacting with the policy offices explicitly as they formulate policy options.

And finally, EIA could help to justify and explain the policies that are recommended by the administration.

Each of these functions tends to support each of the other functions, I would contend. The issue for an agency like EIA is where to draw the line. The further down the line you go, the more you are vulnerable to charges that you are "selling snake oil." The less far you go, the more you are vulnerable to charges of being irrelevant.

From my view, it seems that's a fundamental dilemma in EIA. When I was involved in the predecessor agency, the Federal Energy Administration, the analysis function was involved heavily in the first four of those tasks, and to some extent in the justifying and explaining of the recommended policy. However, the latter function was performed only to a limited extent. There was a very explicit, aggressive role chosen in the first four of the tasks, including helping the policy people ask better questions, and constantly interacting with them.

My impression is that EIA seems to have very deliberately shied away from any but the first, and possibly the second of those functions, partly because the legislation has put fairly high walls between EIA and the policy process.

From my view at Stanford, it seems that these high barriers between the EIA and the policy process may help improve credibility of EIA, because there's less question that analyses are being influenced by policy concerns. But it seems that this is happening at what is pos-

sibly an unacceptable cost. It seems to me that EIA is missing the opportunity to perform a valuable public role, and that EIA is probably playing too limited a role in several policy functions.

Perhaps the most important function in policy analysis is not in supporting good ideas, but rather in killing bad ideas. The ability of people to generate bad ideas seems almost unlimited, and good analysts can play a very major role in helping to put those bad ideas to rest. EIA could play a larger role here.

I think EIA tends to play too small a role in helping the policy people ask better questions, better formulate policies, and better understand the critical distinctions between various policy options.

I believe that honest, useful analysis is quite possible in a policy environment. Such things did occur in FEA, where there was a very aggressive policy role for the analysis offices. It could occur to a much greater extent in the EIA, with a number of safeguards which can be or have been employed.

The safeguards you need are, first, a strong EIA administrator, with the final signoff on the analysis. That does exist. You need some publication of annual reports and policy analyses, so people outside can evaluate the quality of the work; that also exists. You need external organizations which help the government analysts maintain their own honesty. My belief is that most analysts in a policy environment would like to be as honest as possible, but admittedly there are a lot of institutional pressures in the opposite direction. One of the levers that those analysts have are outside organizations. The Professional Audit Review Team is such a lever and could help, and I'm sure does help, EIA stay honest. It would be able to help even if EIA got much more fully involved in the policy process than they currently are.

Other outside organizations also help: CBO, Congressional Research Service, OTA, Congressional staff members, M.I.T. Model Assessment Lab, the Energy Modeling Forum, and interest groups that don't like the results of the analyses. All of these can play very significant roles in keeping an information agency honest by providing additional analysis, examining the analytical methods, providing countermodeling, raising questions and challenging conclusions, and, in general, being willing to step in and object when they see analysis being conducted in a way that seems not honest.

In conclusion, I'd like to finish this by saying that I do feel that EIA probably should take a much more active role in the policy process, and, more importantly, I believe that this can be done fully honestly, in a way that will benefit most everyone—except those people who for one reason or another would rather not have major analytical light cast on policy recommendations being made by Congress and the Administration.

Denny Ellerman, Director, Policy Analysis and Evaluation, National Coal Association

I'm very glad that Jim went before me, because my argument would be that EIA's role should be more limited, and you should build higher walls around it, if they're not high enough already.

Let me go back. I'll introduce myself, first of all, as one of those people from P & E.[1] I'm from the policy shop—one of those biased analysts whose analysis is tainted almost by the mere identification of where it came from. In a word, the people that EIA is supposed to keep honest—at least according to some views of what EIA's function should be. And I would argue that I think as long as we subscribe to that myth, as long as we have that view of EIA, we're going to continue to get bad energy analysis.

With that preface, let me go on—I think the answer lies in the division of labor which exists between EIA and policy analysts. And I would argue that P & E—the policy department of the Department of Energy—is just one, but by no means the only, group of policy analysts in town that would be relevant to some decision.

It seems to me that there are three basic ingredients that make for good policy analysis, or let's say good analysis leading up to a policy decision. The three are data—numbers and so forth; various premises that have to be used, oftentimes, in the absence of data; and then a certain logic by which one moves from the data and the premises to the conclusion. And of course everybody wants good policy and everybody is in favor of killing bad ideas, and we want accurate data, valid premises, and identifiable logic.

Now, it strikes me that the reality of the analysis leading to policy decisions is typically one in which, first of all, there is an absence of data: many of the premises are inherently unverifiable, cannot be verified but must be made nevertheless, in order for these decisions to be made; and that the logic is typically incomplete, if not in fact mystifying.

The problem, then, for the policy analyst in the analysis shops, is as often, I would argue, not a question of establishing the data or verifying premises—some of which can be verified, a lot of which can't—but quite often the job of the policy analyst is one of identifying lapses of logic, questionable premises, and so forth, in documents which are presented as analysis leading to policy decisions. And these come because most of these issues involve a high level of value judgments.

The questioner would say, well, what can EIA contribute in terms of improving the data, the premises, or the logic that characterize this process leading to policy decisions? My answer would be that it can do quite a lot with respect to the data. That is something that is very much needed. There is a certain point at which data does become fairly well accepted.

It seems to me they can do something about the premises, because a lot of those premises are essentially about how data interconnects and the world behaves, which can be more or less verified and accepted on the basis of this data. But by no means all the premises that go into any policy decision, in fact, most of the premises, have been verified, if they could be verified. In most cases, they simply can never be verified because they derive more from people's views about just how things are put together.

Consequently I don't see that that EIA has any special role in improving the logic or identifying the incompleteness of logic that may

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[1] Department of Energy's Office of Policy and Evaluation.

be presented in analysis. That is not to say that that it shouldn't be done, but that EIA doesn't have any special role. I would argue that there are others that perhaps have a more appropriate role in it. I would argue that EIA's role in this process leading to good energy analysis that all of us believe in is to narrow the area of speculation, and to concentrate on the data and those premises which can be verified through the various analytical techniques by which we can test hypotheses about how the world behaves. They should concentrate on that area and establish as much of that data and those premises as can be while leaving all the essentially unverifiable premises, all the issues of logic of argument and everything, to other people to deal with. If they try to go over into that area, trying to be the counterweight to keep the policy analysts honest and so forth, we end up never dealing with the data or getting good data, nor do we even have a set of even a few premises about how the world operates that can be considered verifiable.

The role of EIA becomes one, essentially, of focusing on the data, of interpreting that data, and perhaps working on analytical issues.

I would agree with David Wood's point, that the basic issues are always the same. The policy issue hops around, but these basic analytical arguments continue, so I think there's a fair agenda of things that could be done, which are not pegged on the policy-driven event that has to have the response, typically, in 24 hours.

And then, perhaps, EIA has a role in providing a broad framework, as is legislatively mandated, a forecast and projection of what we think the future might look like, according to one model; this isn't definitive, it hopefully has several different variations on it, representing different assumptions that can be made, but by making it explicit we can lay that out.

It seems to me, as far as the role of keeping DOE honest, I don't believe that's as big a problem as some people make out.

My last point would be that EIA is not the same as the CRS, the CBO, or the GAO. It seems to me Congress has a lot of different analytical agencies around, not to mention Congressional staffs, which are able to provide the sort of hip-shooting analysis that is involved on the policy analysis end of it, where analysis has to be timely and relevant; when you don't have time to verify premises and get the data that's needed. You have to make some assumptions about it and move, and the best the analyst can hope to do is get a decent logic hung together and premises which are better than some others. That's what the policy analyst is all about—feeding into the decisionmaker, who has the unenviable task of ultimately making some sort of call on an issue.

I would submit there are lots of other people around town other than EIA who do that, or who can do that, and all of them would like to have as much good data that everybody could agree upon, and as many verifiable hypotheses or premises about which there is general agreement on, as possible. If EIA does not do that, then we will simply never have these, and it will just be one more among the cacophony that already exists of analysts and hipshooters who are out there working on the issues.

Walter Schroeder, Assistant to the Chairman, Federal Energy Regulatory Commission

Actually, the last time I was here was when I was still working on the Hill, and it's out of that experience that a story that Bud Brown used to tell somehow comes to mind when I listen to Jim Sweeney and Denny Ellerman. He used to tell this story about a Congressman with a young intern who had just come to work for him, and the Congressman said, "Why don't you come into my office today and I'll show you how a Congressman operates." And so in came a group of anti-abortion lobbyists, and they went through a long impassioned plea against abortion, and the Congressman said, "You're absolutely right. I'm going to vote against the abortion bill," and ushered them out, and the next group of ladies that came in was a group of National Organization of Women, for abortion, for freedom of choice. They went through their long and impassioned plea. The Congressman sits there and nods his head and says, "You're absolutely right. I'm going to vote for abortion rights." He ushers them out, and as they leave, the intern says to him, "How can you possibly agree with both of them? They have absolutely opposite opinions. They can't both be right." And he turns to the intern and says, "Well, you're absolutely right." (Laughter.) It really depends on what you expect EIA to be, or what EIA's missions ought to be.

EIA started out—before it was EIA, when it was FEA—as more like the institution that Jim Sweeney is talking about, where you had an inter-related data collection and policy analysis function that had both strengths and limitations to it, as far as I'm concerned. It's now by law something that looks more like Denny Ellerman is recommending, with a more pristine data collection and compilation mission, not to be polluted by the temptations of policy.

I'm not sure which is the right choice, but I think there are some pretty serious implications of either choice. It ought to be a conscious choice. I'm not sure we have fully examined the implications of the choice that's been made.

Most notably, what I've seen in EIA over the several years of its former and current incarnation, has been that a lot of the good staff who are sensitive to the needs of the audience that the department plays to—both the Congress and the public—who were sensitive to the policy issues—have left, because they've been told that they're not allowed to do policy. And frankly, if I'd been there I would have left, too. I don't know how many people enjoy just collecting numbers, and publishing numbers, and being told that they're not allowed into the question of the implications of those numbers for current issues, but it strikes me as an almost unreasonable assignment. So I think that the mold that we put EIA in is kind of a Bureau of Labor Statistics mold. And we do need something like that in energy—we need an agency that does give us those kinds of numbers, that has, over time, developed a means of collecting accurate information, knows how to collect information, but is really more of a numbers factory than a policy shop.

The problem that EIA has had—I think the criticisms that have come to EIA most recently come about from EIA trying, or failing to

resist, the temptation to get into policy. They get asked by Congress to get into policy still; they're still asked to do analyses. Congress asks EIA to do an analysis, the analysis comes out somehow not terribly well tuned in to the most current facets of the political issue under debate, and EIA gets banged around as a consequence. Yet I'm not sure what else you would have expected them to give you. We're asking them to do things that they can't do; we're asking them almost to do things that we're on the one hand asking them to do and on the other hand telling them not to do.

I guess if I had to choose, I'd go back to the way it was, in that I don't think you can legislate competent analysis any more than you can legislate ethics, and the Congress has tried to do both. It's a people problem. If you have good people at EIA doing analysis, that's a good thing, because then they'll know the kind of data that's likely to be needed in the future. But if the only way EIA knows what kind of data to collect is by throwing pieces of paper over the brick wall that Denny would have them work around, or over, I'm not sure that we can look forward to an increasingly tuned in mission and response from EIA.

So—you're both right; it's a question of what do we want EIA to be. It's a question that we have to ask. And I would say that in my current role at FERC, I've come to rely on EIA much more for providing the kind of data support that is part of their mission and which, I think, they do much better now than they did two years ago, much to Dr. Moses credit.

But I don't think that's enough, frankly. And I don't think in the long run it's going to be enough for anybody. So I worry a little bit about our having drawn artificial distinctions between policy and analysis that, in the long run, may make both functions be performed less well.

Appendix D

Energy Information: Major Requirements in Law

(Prepared by Susan R. Abbasi, Analyst, Environment and Natural Resources Policy Division)

The Energy Information Administration (EIA) was established in 1977 by the Department of Energy Organization Act (Public Law 95–91). This law spelled out a broad and comprehensive statutory mandate intended to centralize most Federal energy information and data functions in the EIA. Other major energy laws transferred to the Department of Energy, and thus primarily to the EIA, additional statutory requirements for data collecting and reporting and analysis of energy information. This brief summary sets forth the mandate in the DOE Act and in the major laws that provide energy information requirements, which now reside primarily in EIA.

The Department of Energy Organization Act (Public Law 95–91)

Among the overall purposes of the Department enumerated in the Act in sec. 102(7) is: "to continue and improve the effectiveness and objectivity of a central energy data collection and analysis program within the Department."

In order to accomplish this purpose, sec. 205 establishes the Energy Information Administration, to be headed by an Administrator who is to be appointed by the President with the consent of the Senate, and who is to be a "person who, by reason of professional background and experience, is specially qualified to manage an energy information system." Subsection (b) directs that the Secretary shall delegate to the Administrator (not necessarily exclusively) "the functions vested in him by law relating to gathering, analysis and dissemination of energy information . . ."

The responsibilities of the EIA Administrator are spelled out as follows:

> Carrying out a central, comprehensive and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy resource reserves, energy production, demand, and technology, and related economic and statistical information, or which is relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs. (Sec. 205(a)(2).)

In subsection (f), the Administrator is directed to provide, upon request, to any other administration, commission, or office within the Department any information or analysis in his possession when that entity determines that such information would relate to its functions.

Subsection (h) provides in considerable detail for the development of an energy industry profile which would provide "a statistically ac-

curate profile of each line of commerce in the energy industry in the United States." This section requires a detailed financial reporting system by the companies designated to be covered by this requirement.

In sec. 657 of the Act, an annual report is required of the Secretary, large portions of which are prepared by the EIA because of the nature of the information required. Included in the required report are:

> Projected energy needs of the United States, with a comprehensive summary of data pertaining to all fuel and energy needs of residents by urban and non-urban status;
>
> Estimates of domestic and foreign energy supplies, and the quantities of energy expected from each different source;
>
> Current and foreseeable trends in price, quality, management and utilization of energy resources, and their effects on the environment, the economy, and society.

The subsections mentioned here are provided in full in Attachment 1.

The Federal Energy Administration Act of 1974 (Public Law 93–275)

The FEA was one of the main predecessor agencies of the DOE, and its authorities were transferred to the new department. Among the responsibilities assigned to the FEA Administrator were: To "assess the adequacy of energy resources to meet demands in the immediate and longer range future for all sectors of the economy and for the general public" (Sec. 5(b)(2)), and "collect, evaluate, assemble, and analyze energy information on reserves, production, demand, and related economic data" (Sec. 5(b)(9)).

In sec. 13, the Administrator is directed to:

> Collect, assemble, evaluate, and analyze energy information by categorical groupings, established by the Administrator, of sufficient comprehensiveness and particularity to permit fully informed monitoring and policy guidance with respect to the exercise of his functions under this Act.

This section goes on to grant powers of investigation for verification purposes, power to require reporting by companies, subpoena power, and authority to collect information from other agencies.

An annual report is required in sec. 15 which mandates various analyses and projections. This was later encompassed in the DOE annual report.

Economic analysis of proposed actions is required in sec. 18 of the FEA Act.

Sec. 25 requires the establishment and maintenance of a file with information on exports of fossil energy resources.

The full text of these sections is provided in Attachment 2.

Energy Conservation and Production Act (Public Law 94–385)

This Act extended and amended the FEA Act in 1976. Sec. 142 of this Act added secs. 51 through 59 to the FEA Act and specified in considerable detail additional requirements for energy information collection.

Sec. 51 established an Office of Energy Information and Analysis, with a Director to be appointed by the President. This director was to receive delegated authority from the Administrator to carry out the legal powers granted by sec. 11 of the Energy Supply and Environmental Coordination Act (see below).

Among the requirements of the subsequent sections of this amendment, the Office of Energy Information and Analysis was directed to establish a National Energy Information System which is "required to provide a description of and facilitate analysis of energy supply and consumption within and affecting the United States," as might be needed by FEA, the Congress or other officers of the United States Government with energy policy responsibilities.

Sec. 54 specified that scientific, engineering, statistical, or other technical capability be established by the Office to verify accuracy of information. Analytic capabilities specified were economics, finance and accounting, development of alternative forecasting models, and "such other capabilities as the Director deems necessary to achieve the purposes of this Act."

Access to energy information in the hands of other agencies is provided for, unless prohibited by law, as is congressional access to any information held by the Office.

The full text of these amendments is provided in Attachment 3.

Energy Supply and Environmental Coordination Act of 1974 (Public Law 93–319)

This Act provided in sec. 11 basic authorities to FEA, and subsequently to DOE, for obtaining information and for entering premises to verify information provided to it. The section begins by stating:

> For the purpose of assuring that the Federal Energy Administration, the Congress, the States, and the public have access to and are able to obtain reliable energy information, the Federal Energy Administrator shall request, acquire, and collect such energy information as he determines to be necessary to assist in the formulation of energy policy or to carry out the purposes of this Act . . .

Reporting requirements for companies were spelled out, subpoena power was provided, and the power to administer oaths was given to the Administrator.

Specific requirements for energy information included the development and publishing of quarterly reports containing:

Imports of crude oil, residual fuel oil, refined petroleum products, natural gas, and coal, with country of origin specified;

Domestic reserves and production of crude oil, natural gas, and coal;

Refinery activities, including amounts run by each refinery, amounts allocated to each, percentage of capacity utilized, and amounts of products refined.

Reports of inventories, on a national, regional and State-by-State basis.

The full text of this section of ESECA is provided in Attachment 4.

Federal Nonnuclear Energy Research and Development Act of 1974 (Public Law 93–577)

This Act directed in sec. 17 that the Administrator of the Energy Research and Development Administration (ERDA), which was subsequently added into the DOE, "shall promptly establish, develop, acquire, and maintain a central source of information on all energy resources and technology in furtherance of the Administrator's research, development and demonstration mission . . ."

The full text of this section is found in Attachment 5.

Energy Reorganization Act of 1974 (Public Law 93–438)

This Act created the Energy Research and Development Administration and the Nuclear Regulatory Commission. Among the responsibilities of the Administrator set forth in sec. 103 are declarations with respect to energy information:

> Developing, collecting, distributing, and making available for distribution, scientific and technical information concerning the manufacture or development of energy and its efficient extraction, conversion, transmission, and utilization;
>
> Creating and encouraging the development of general information to the public on all energy conservation technologies and energy sources as they become available for general use, and the Administrator . . . shall to the extent practicable, disseminate such information through the use of mass communication.

Energy Policy and Conservation Act (EPCA) (Public Law 94-163)

This law provided for exchanges of information among members of the international energy program, provided authority and responsibility to the Comptroller General for verification of energy information, and amended sec. 11 of the Energy Supply and Environmental Coordination Act to provide that persons engaged in production of oil or natural gas must keep energy information in accord with accounting practices outlined in this Act, and submit reports with respect to such energy information to Congress and the President.

See Attachment 6 for these sections of EPCA.

The Federal Power Act (16 U.S.C. 792 et seq.)

The Federal Power Act is the basic authority for the Federal Power Commission, which was transferred to the Department of Energy, to require the keeping of data and information and the collection of such data by the Commission, with respect to electric utilities and water power facilities. Among these authorities, relevant sections of which are shown in Attachment 7, is a wide-ranging authority in sec. 311 for the Commission to:

> Conduct investigations regarding the generation, transmission, distribution, and sale of electric energy, however produced, throughout the United States and its possessions, whether or not otherwise subject to the jurisdiction of the Commission, including the generation, transmission, distribution, and sale of electric energy by any agency . . . It shall, so far as possible, secure and keep current information regarding the ownership, operation, management, and control of all facilities for such generation, transmission, distribution and sale; the capacity and output thereof and the relationship between the two; the cost of generation, transmission, and distribution; the rates, charges, and contracts in respect of the sale of energy and its service to . . . purchasers by private and public agencies . . .

EIA has inherited most of these information gathering authorities.

The Natural Gas Act (15 U.S.C. 717 et seq.)

Another major basic authority for the gathering of data and information by the Federal Power Commission is the Natural Gas Act. Among these requirements, relevant sections of which appear in Attachment 8, is sec. 10, which requires from every natural gas company "such annual and other periodic or special reports as the Commission may by rules and regulations or order prescribe as necessary or appropriate to assist the Commission in the proper administration of this Act."

Emergency Energy Conservation Act of 1979 (Public Law 96–102)

A study of commercial and industrial storage of fuel is required by sec. 241 of this law, which directs that the report must indicate to

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what extent storage activities have increased since November 1978, and provide estimated amounts of gasoline and middle distillates in storage. The Act also requires in sec. 242 that the Secretary of Energy is to establish and maintain a data collection program for monitoring supply and demand levels of middle distillates in each State at refining, wholesale, and retail levels.

These provisions are reprinted in Attachment 9.

Attachment 1

In this attachment, and those following, only those sections of each law that pertain to energy information specifically are shown.

Department of Energy Organization Act (Public Law 95–91)

Sec. 102. The Congress therefore declares that the establishment of a Department of Energy is in the public interest and will promote the general welfare by assuring coordinated and effective administration of Federal energy policy and programs. It is the purpose of this Act—

* * * * * * *

(7) to continue and improve the effectiveness and objectivity of a central energy data collection and analysis program within the Department;

* * * * * * *

ENERGY INFORMATION ADMINISTRATION

Sec. 205. (a) (1) There shall be within the Department an Energy Information Administration to be headed by an Administrator who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for in level IV of the Executive Schedule under section 5315 of title 5, United States Code. The Administrator shall be a person who, by reason of professional background and experience, is specially qualified to manage an energy information system.

(2) The Administrator shall be responsible for carrying out a central, comprehensive, and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy resource reserves, energy production, demand, and technology, and related economic and statistical information, or which is relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs.

(b) The Secretary shall delegate to the Administrator (which delegation may be on a nonexclusive basis as the Secretary may determine may be necessary to assure the faithful execution of his authorities and responsibilities under law) the functions vested in him by law relating to gathering, analysis, and dissemination of energy information (as defined in section 11 of the Energy Supply and Environmental Coordination Act of 1974) and the Administrator may act in the name of the Secretary for the purpose of obtaining enforcement of such delegated functions.

(c) in addition to, and not in limitation of the functions delegated to the Administrator pursuant to other subsections of this section, there shall be vested in the Administrator, and he shall perform, the functions assigned to the Director of the Office of Energy Information and Analysis under part B of the Federal Energy Administration

Act of 1974, and the provisions of sections 53(d) and 59 thereof shall be applicable to the Administrator in the performance of any function under this Act.

(d) The Administrator shall not be required to obtain the approval of any other officer or employee of the Department in connection with the collection or analysis of any information; nor shall the Administrator be required, prior to publication, to obtain the approval of any other officer or employee of the United States with respect to the substance of any statistical or forecasting technical reports which he has prepared in accordance with law.

(e) The Energy Information Administration shall be subject to an annual professional audit review of performance as described in section 55 of part B of the Federal Energy Administration Act of 1974.

(f) The Administrator shall, upon request, promptly provide any information or analysis in his possession pursuant to this section to any other administration, commission, or office within the Department which such administration, commission, or office determines relates to the functions of such administration, commission, or office.

(g) Information collected by the Energy Information Administration shall be cataloged and, upon request, any such information shall be promptly made available to the public in a form and manner easily adaptable for public use, except that this subsection shall not require disclosure of matters exempted from mandatory disclosure by section 552(b) of title 5, United States Code. The provisions of section 11(d) of the Energy Supply and Environmental Coordination Act of 1974, and section 17 of the Federal Nonnuclear Energy Research and Development Act of 1974, shall continue to apply to any information obtained by the Administrator under such provisions.

(h)(1)(A) In addition to the acquisition, collection, analysis, and dissemination of energy information pursuant to this section, the Administrator shall identify and designate "major energy-producing companies" which alone or with their affiliates are involved in one or more lines of commerce in the energy industry so that the energy information collected from such major energy-producing companies shall provide a statistically accurate profile of each line of commerce in the energy industry in the United States.

(B) In fulfilling the requirements of this subsection the Administrator shall—

(i) utilize, to the maximum extent practicable, consistent with the faithful execution of his responsibilities under this Act, reliable statistical sampling techniques; and

(ii) otherwise give priority to the minimization of the reporting of energy information by small business.

(2) The Administrator shall develop and make effective for use during the second full calendar year following the date of enactment of this Act the format for an energy-producing company financial report. Such report shall be designed to allow comparison on a uniform and standardized basis among energy-producing companies and shall permit for the energy-related activities of such companies—

(A) an evaluation of company revenues, profits, cash flow, and investments in total, for the energy-related lines of commerce in

which such company is engaged and for all significant energy-related functions within such company;

(B) an analysis of the competitive structure of sectors and functional groupings within the energy industry;

(C) the segregation of energy information, including financial information, describing company operations by energy source and geographic area;

(D) the determination of costs associated with exploration, development, production, processing, transportation, and marketing and other significant energy-related functions within such company; and

(E) such other analyses or evaluations as the Administrator finds is necessary to achieve the purposes of this Act.

(3) The Administrator shall consult with the Chairman of the Securities and Exchange Commission with respect to the development of accounting practices required by the Energy Policy and Conservation Act to be followed by persons engaged in whole or in part in the production of crude oil and natural gas and shall endeavor to assure that the energy-producing company financial report described in paragraph (2) of this subsection, to the extent practicable and consistent with the purposes and provisions of this Act, is consistent with such accounting practices where applicable.

(4) The Administrator shall require each major energy-producing company to file with the Administrator an energy-producing company financial report on at least an annual basis and may request energy information described in such report on a quarterly basis if he determines that such quarterly report of information will substantially assist in achieving the purposes of this Act.

(5) A summary of information gathered pursuant to this section, accompanied by such analysis as the Administrator deems appropriate, shall be included in the annual report of the Department required by subsection (a) of section 657 of this Act.

(6) As used in this subsection the term—

(A) "energy-producing company" means a person engaged in:

(i) ownership or control of mineral fuel resources or nonmineral energy resources;

(ii) exploration for, or development of, mineral fuel resources;

(iii) extraction of mineral fuel or nonmineral energy resources;

(iv) refining, milling, or otherwise processing mineral fuels or nonmineral energy resources;

(v) storage of mineral fuels or nonmineral energy resources;

(vi) the generation, transmission, or storage of electrical energy;

(vii) transportation of mineral fuels or nonmineral energy resources by any means whatever; or

(viii) wholesale or retail distribution of mineral fuels, nonmineral energy resources or electrical energy;

(B) "energy industry" means all energy-producing companies; and

(C) "person" has the meaning as set forth in section 11 of the Energy Supply and Environmental Coordination Act of 1974.

(7) The provisions of section 1905 of title 18, United States Code, shall apply in accordance with its terms to any information obtained by the Administration pursuant to this subsection.

* * * * * * *

ANNUAL REPORT

SEC. 657. The Secretary shall, as soon as practicable after the end of each fiscal year, commencing with the first complete fiscal year following the effective date of this Act, make a report to the President for submission to the Congress on the activities of the Department during the preceding fiscal year. Such report shall include a statement of the Secretary's goals, priorities, and plans for the Department, together with an assessment of the progress made toward the attainment of those goals, the effective and efficient management of the Department, and progress made in coordination of its functions with other departments and agencies of the Federal Government. In addition, such report shall include the information required by section 15 of the Federal Energy Administration Act of 1974, section 307 of the Energy Reorganization Act of 1974, and section 15 of the Federal Nonnuclear Energy Research and Development Act of 1974, and shall include:

(1) projected energy needs of the United States to meet the requirements of the general welfare of the people of the United States and the commercial and industrial life of the Nation, including a comprehensive summary of data pertaining to all fuel and energy needs of residents of the United States residing in—

(A) areas outside standard metropolitan statistical areas; and

(B) areas within such areas which are unincorporated or are specified by the Bureau of the Census, Department of Commerce, as rural areas;

(2) an estimate of (A) the domestic and foreign energy supply on which the United States will be expected to rely to meet such needs in an economic manner with due regard for the protection of the environment, the conservation of natural resources, and the implementation of foreign policy objectives, and (B) the quantities of energy expected to be provided by different sources (including petroleum, natural and synthetic gases, coal, uranium, hydroelectric, solar, and other means) and the expected means of obtaining such quantities;

(3) current and foreseeable trends in the price, quality, management, and utilization of energy resources and the effects of these trends on the social, environmental, economic, and other requirements of the Nation;

(4) a summary of research and development efforts funded by the Federal Government to develop new technologies, to forestall energy shortages, to reduce waste, to foster recycling, to encourage conservation practices, and to increase efficiency; and further such summary shall include a description of the activities the

Department is performing in support of environmental, social, economic and institutional, biomedical, physical and safety research, development, demonstration, and monitoring activities necessary to guarantee that technological programs, funded by the Department, are undertaken in a manner consistent with and capable of maintaining or improving the quality of the environment and of mitigating any undesirable environmental and safety impacts;

(5) a review and appraisal of the adequacy and appropriateness of technologies, procedures, and practices (including competitive and regulatory practices) employed by Federal/State, and local governments and nongovernmental entities to achieve the purposes of this Act;

(6) a summary of cooperative and voluntary efforts that have been mobilized to promote conservation and recycling, together with plans for such efforts in the succeeding fiscal year, and recommendations for changes in laws and regulations needed to encourage more conservation and recycling by all segments of the Nation's populace;

(7) a summary of substantive measures taken by the Department to stimulate and encourage the development of new manpower resources through the Nation's colleges and universities and to involve these institutions in the execution of the Department's research and development programs; and

(8) to the extent practicable, a summary of activities in the United States by companies or persons which are foreign owned or controlled and which own or control United States energy sources and supplies, including the magnitude of annual foreign direct investment in the energy sector in the United States and exports of energy resources from the United States by foreign owned or controlled business entities or persons, and such other related matters as the Secretary may deem appropriate.

Attachment 2

Federal Energy Administration Act of 1974 (Public Law 93–275)

Sec. 5. (b) To the extent authorized by subsection (a) of this section, the Administrator shall—

(1) advise the President and the Congress with respect to the establishment of a comprehensive national energy policy in relation to the energy matters for which the Administration has responsibility, and, in coordination with the Secretary of State, the integration of domestic and foreign policies relating to energy resource management;

(2) assess the adequacy of energy resources to meet demands in the immediate and longer range future for all sectors of the economy and for the general public;

(9) collect, evaluate, assemble, and analyze energy information on reserves, production, demand, and related economic data;

* * * * * * *

ACCESS TO INFORMATION BY THE COMPTROLLER GENERAL

Sec. 12. (a) For the duration of this Act, the Comptroller General of the United States shall monitor and evaluate the operations of the Administration, including its reporting activities. The Comptroller General shall (1) conduct studies of existing statutes and regulations governing the Administration's programs; (2) review the policies and practices of the Administration; (3) review and evaluate the procedures followed by the Administrator in gathering, analyzing, and interpreting energy statistics, data, and information related to the management and conservation of energy, including but not limited to data related to energy costs, supply, demand, industry structure, and environmental impacts; and (4) evaluate particular projects or programs. The Comptroller General shall have access to such data within the possession or control of the Administration from any public or private source whatever, notwithstanding the provisions of any other law, as are necessary to carry out his responsibilities under this Act and shall report to the Congress at such times as he deems appropriate with respect to the Administration's programs, including his recommendations for modifications in existing laws, regulations, procedures, and practices.

(b) The Comptroller General or any of his authorized representatives in carrying out his responsibilities under this section may request access to any books, documents, papers, statistics, data, records, and information of any person owning or operating facilities or business premises who is engaged in any phase of energy supply or major

energy consumption, where such material relates to the purposes of this Act, including but not limited to energy costs, demand, and supply, industry structure, and environmental impacts. The Comptroller General may request such person to submit in writing such energy information as the Comptroller General may prescribe.

(c) The Comptroller General of the United States, or any of his duly authorized representatives, shall have access to and the right to examine any books, documents, papers, records, or other recorded information of any recipients of Federal funds or assistance under contracts, leases, cooperative agreements, or other transactions entered into pursuant to subsection (d) or (g) of section 7 of this Act which in the opinion of the Comptroller General may be related or pertinent to such contracts, leases, cooperative agreements, or similar transactions.

(d) To assist in carrying out his responsibilities under this section, the Comptroller General may, with the concurrence of a duly established committee of Congress having legislative or investigative jurisdiction over the subject matter and upon the adoption of a resolution by such a committee which sets forth specifically the scope and necessity therefor, and the specific identity of those persons from whom information is sought, sign and issue subpenas requiring the production of the books, documents, papers, statistics, data, records, and information referred to in subsection (b) of this section.

(e) In case of disobedience to a subpena issued under subsection (d) of this section, the Comptroller General may invoke the aid of any district court of the United States in requiring the production of the books, documents, papers, statistics, data, records, and information referred to in subsection (b) of this section. Any district court of the United States within the jurisdiction where such person is found or transacts business may, in case of contumacy or refusal to obey a subpena issued by the Comptroller General, issue an order requiring such person to produce the books, documents, papers, statistics, data, records, or information; and any failure to obey such order of the court shall be punished by the court as contempt thereof.

(f) Reports submitted by the Comptroller General to the Congress pursuant to this section shall be available to the public at reasonable cost and upon identifiable request. The Comptroller General may not disclose to the public any information which concerns or relates to a trade secret or other matter referred to in section 1905 of title 18, United States Code, except that such information shall be disclosed by the Comptroller General or the Administrator, in a manner designed to preserve its confidentiality—

(1) to other Federal Government departments, agencies, and officials for official use upon request;

(2) to committee of Congress upon request; and

(3) to a court in any judicial proceeding under court order.

INFORMATION-GATHERING POWER

SEC. 13. (a) The Administration shall collect, assemble, evaluate, and analyze energy information by categorical groupings, established by the Administrator, of sufficient comprehensiveness and particularity

to permit fully informed monitoring and policy guidance with respect to the exercise of his functions under this Act.

(b) All persons owning or operating facilities or business premises who are engaged in any phase of energy supply or major energy consumption shall make available to the Administrator such information and periodic reports, records, documents, and other data, relating to the purposes of this Act, including full identification of all data and projections as to source, time, and methodology of development, as the Administrator may prescribe by regulation or order as necessary or appropriate for the proper exercise of functions under this Act.

(c) The Administrator may require, by general or special orders, any person engaged in any phase of energy supply or major energy consumption to file with the Administrator in such form as he may prescribe, reports or answers in writing to such specific questions, surveys, or questionnaires as may be necessary to enable the Administrator to carry out his functions under this Act. Such reports and answers shall be made under oath, or otherwise, as the Administrator may prescribe, and shall be filed with the Administrator within such reasonable period as he may prescribe.

(d) The Administrator, to verify the accuracy of information he has received or otherwise to obtain information necessary to perform his functions under this Act, is authorized to conduct investigations, and in connection therewith, to conduct, at reasonable times and in a reasonable manner, physical inspections at energy facilities and business premises, to inventory and sample any stock of fuels or energy sources therein, to inspect and copy records, reports, and documents from which energy information has been or is being compiled, and to question such persons as he may deem necessary.

(e)(1) The Administrator, or any of his duly authorized agents, shall have the power to require by subpena the attendance and testimony of witnesses, and the production of all information, documents, reports, answers, records, accounts, papers, and other data and documentary evidence which the Administrator is authorized to obtain pursuant to this section.

(2) Any appropriate United States district court may, in case of contumacy or refusal to obey a subpena issued pursuant to this section, issue an order requiring the party to whom such subpena is directed to appear before the Administration and to give testimony touching on the matters in question, or to produce any matter described in paragraph (1) of this subsection, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(f) The Administrator shall collect from departments, agencies and instrumentalities of the executive branch of the Government (including independent agencies), and each such department, agency, and instrumentality is authorized and directed to furnish, upon his request, information concerning energy resources on lands owned by the Government of the United States. Such information shall include, but not be limited to quantities of reserves, current or proposed leasing agreements, environmental considerations, and economic impact analyses.

(g) With respect to any person who is subject to any rule, regulation, or order promulgated by the Administrator or to any provision

of law the administration of which is vested in or transferred or delegated to the Administrator, the Administrator may require, by rule, the keeping of such accounts or records as he determines are necessary or appropriate for determining compliance with such rule, regulation, order, or any applicable provision of law.

(h) In exercising his authority under this Act and any other provision of law relating to the collection of energy information, the Administrator shall take into account the size of businesses required to submit reports with the Administrator so as to avoid, to the greatest extent practicable, overly burdensome reporting requirements on small marketers and distributors of petroleum products and other small business concerns required to submit reports to the Administrator.

(i) Any failure to make information available to the Administrator under subsection (b), any failure to comply with any general or special order under subsection (c), or any failure to allow the Administrator to act under subsection (d) shall be subject to the same penalties as any violation of section 11 of the Energy Supply and Environmental Coordination Act of 1974 or any rule, regulation, or order issued under such section.

PUBLIC DISCLOSURE OF INFORMATION

SEC. 14. (a) The Administrator shall make public, on a continuing basis, any statistical and economic analyses, data, information, and whatever reports and summaries are necessary to keep the public fully and currently informed as to the nature, extent, and projected duration of shortages of energy supplies, the impact of such shortages, and the steps being taken to minimize such impacts.

(b) Subject to the provisions of this Act, section 552 of title 5, United States Code, shall apply to public disclosure of information by the Administrator: *Provided*, That notwithstanding said section, the provisions of section 1905 of title 18, United States Code, or any other provision of law, (1) all matters reported to, or otherwise obtained by, any person exercising authority under this Act containing trade secrets or other matter referred to in section 1905 of title 18, United States Code, may be disclosed to other persons authorized to perform functions under this Act solely to carry out the purposes of the Act, or when relevant in any proceeding under this Act; and (2) the Administrator shall disclose to the public, at a reasonable cost, and upon a request which reasonably describes the matter sought, any matter of the type which could not be excluded from public annual reports to the Securities and Exchange Commission pursuant to section 13 or 15(d) of the Securities Exchange Act of 1934 by a business enterprise exclusively engaged in the manufacture or sale of a single product, unless such matter concerns or relates to the trade secrets, processes, operations, style of work, or apparatus of a business enterprise.

(c) To protect and assure privacy of individuals and confidentiality of personal information, the Administrator is directed to establish guidelines and procedures for handling any information which the Administration obtains pertaining to individuals. He shall provide, to the extent practicable, in such guidelines and procedures a method for allowing any such individual to gain access to such information pertaining to himself.

REPORTS AND RECOMMENDATIONS

SEC. 15. (a) Not later than one year after the effective date of this Act, the Administrator shall submit a report to the President and Congress which will provide a complete and independent analysis of actual oil and gas reserves and resources in the United States and its Outer Continental Shelf, as well as of the existing productive capacity and the extent to which such capacity could be increased for crude oil and each major petroleum product each year for the next ten years through full utilization of available technology and capacity. The report shall also contain the Administration's recommendations for improving the utilization and effectiveness of Federal energy data and its manner of collection. The data collection and analysis portion of this report shall be prepared by the Federal Trade Commission for the Administration. Unless specifically prohibited by law, all Federal agencies shall make available estimates, statistics, data and other information in their files which, in the judgment of the Commission or Administration, are necessary for the purposes of this subsection.

(b) The Administrator shall prepare and submit directly to the Congress and the President every year after the date of enactment of this Act a report which shall include—

(1) a review and analysis of the major actions taken by the Administrator;

(2) an analysis of the impact these actions have had on the Nation's civilian requirements for energy supplies for materials and commodities;

(3) a projection of the energy supply for the midterm and long term for each of the major types of fuel and the potential size and impact of any anticipated shortages, including recommendations for measures to—

(A) minimize deficiencies of energy supplies in relation to needs;

(B) maintain the health and safety of citizens;

(C) maintain production and employment at the highest feasible level;

(D) equitably share the burden of shortages among individuals and business firms; and

(E) minimize any distortion of voluntary choices of individuals and firms;

(4) a summary listing of all recipients of funds and the amount thereof within the preceding period;

(5) a summary listing of information-gathering activities conducted under section 13 of this Act; and

(6) an analysis of the energy needs of the United States and the methods by which such needs can be met, including both tax and nontax proposals and energy conservation strategies.

In the first annual report submitted after the date of enactment of the Energy Conservation and Production Act, the Administrator shall include in such report with respect to the analysts referred to in paragraph (6) a specific discussion of the utility and relative benefits of employing a Btu tax as a means for obtaining national energy goals.

(c) Not later than thirty days after the effective date of this Act, the Administrator shall issue preliminary summer guidelines for citizen fuel use.

(d) The Administrator shall provide interim reports to the Congress from time to time and when requested by committees of Congress.

(e) The analysis referred to in subsection (b) (6) shall include, for each of the next five fiscal years following the year in which the annual report is submitted and for the tenth fiscal year following such year—

(1) the effect of various conservation programs on such energy needs;

(2) the alternate methods of meeting the energy needs identified in such annual report and of—

(A) the relative capital and other economic costs of each such method;

(B) the relative environmental, national security, and balance-of-trade risks of each such method;

(C) the other relevant advantages and disadvantages of each such method; and

(3) recommendations for the best method or methods of meeting the energy needs identified in such annual report and for legislation needed to meet those needs.

Notwithstanding the termination of this Act, the President shall designate an appropriate Federal agency to conduct the analysis specified in subsection (b) (6).

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ECONOMIC ANALYSIS OF PROPOSED ACTIONS

SEC. 18. (a) In carrying out the provisions of this Act, the Administrator shall, to the greatest extent practicable, insure that the potential economic impacts of proposed regulatory and other actions are evaluated and considered, including but not limited to an analysis of the effect of such actions on—

(1) the fiscal integrity of State and local governments;

(2) vital industrial sectors of the economy;

(3) employment, by industrial and trade sectors, as well as on a national, regional, State, and local basis;

(4) the economic vitality of regional, State, and local areas;

(5) the availability and price of consumer goods and services;

(6) the gross national product;

(7) low and middle income families as defined by the Bureau of Labor Statistics;

(8) competition in all sectors of industry; and

(9) small business.

(b) The Administrator shall develop analyses of the economic impact of various conservation measures on States or significant sectors thereof, considering the impact on both energy for fuel and energy as feed stock for industry.

(c) Such analyses shall, wherever possible, be made explicit, and to the extent possible, other Federal agencies and agencies of State and local governments which have special knowledge and expertise relevant to the impact of proposed regulatory or other actions shall

be consulted in making the analyses, and all Federal agencies are authorized and directed to cooperate with the Administrator in preparing such analyses: *Provided*, That the Administrator's actions pursuant to this section shall not create any right of review or cause of action except as would otherwise exist under other provisions of law.

(d) The Administrator, together with the Secretaries of Labor and Commerce, shall monitor the economic impact of any energy actions taken by the Administrator, and shall provide the Congress with an annual report on the impact of the energy shortage and the Administrator's actions on employment and the economy. Such report shall contain recommendations as to whether additional Federal programs of employment and economic assistance should be put into effect to minimize the impact of the energy shortage and any actions taken.

(e) The Administrator shall formulate and implement regulatory and other actions in a manner (1) which does not unduly discriminate against any industry or any region of the United States; and (2) designed to insure that, to the greatest extent possible, the costs and burdens of meeting energy shortages shall be borne equally by every sector and segment of the country and of the economy.

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INFORMATION CONCERNING TRANSACTION, SALE, EXCHANGE OR SHIPMENT INVOLVING THE EXPORT FROM THE UNITED STATES TO A FOREIGN NATION OF COAL AND ANY REFINED PETROLEUM PRODUCT

SEC. 25. (a) The Administrator is authorized and directed to establish and maintain a file which shall contain information concerning every transaction, sale, exchange or shipment involving the export from the United States to a foreign nation of coal, crude oil, residual oil or any refined petroleum product. Information to be included in the file shall be current and shall include, but shall not be limited to, the name of the exporter (including the name or names of the holders of any beneficial interests), the volume and type of product involved in the export transaction, the manner of shipment and identification of the vessel or carrier, the destination, the name of the purchaser if a sale, exchange or other transaction is involved, and a statement of reasons justifying the export.

(b) Upon request of any committee of Congress or the head of any Federal agency, the Administrator shall promptly provide any information maintained in the file and a report thereon to such committee, or agency head, except where the President finds such disclosure to be detrimental to national security.

(c) Notwithstanding any other provision of law, any Federal agency which collects or has information relevant to the functions required by this section shall make such information available to the Administrator.

(d) The Administrator shall not be required to collect independently information described in subsection (a) if he can secure the information described in subsection (a) from other Federal agencies and the information secured from such agencies is available to the Congress pursuant to a request under subsection (b).

FOREIGN OWNERSHIP

SEC. 26. The Administrator shall conduct a comprehensive review of foreign ownership of, influence on, and control of domestic energy sources and supplies. Such review shall draw upon existing information, where available, and any independent investigation necessary by the Administration. The Administrator shall, on or before the expiration of the one hundred and eighty day period following the effective date of this Act, report to the Congress in sufficient detail so as to apprise the Congress as to the extent and forms of such foreign ownership of, influence on, and control of domestic energy sources and supplies, and shall thereafter continue to monitor such ownership, influence and control.

Attachment 3

Energy Conservation and Production Act
(Public Law 94–385)

The following sections were added by amendments to the FEA Act in the *Energy Conservation and Production Act* (*Public Law 94–385*) :

ESTABLISHMENT OF OFFICE OF ENERGY INFORMATION AND ANALYSIS

Sec. 51. (a)(1) There is established within the Federal Energy Administration an Office of Energy Information and Analysis (hereinafter in this Act referred to as the "Office") which shall be headed by a Director who shall be appointed by the President, by and with the advice and consent of the Senate.

(2) The Director shall be a person who, by reason of professional background and experience, is specially qualified to manage an energy information system.

(b) The Administrator shall delegate (which delegation may be on a nonexclusive basis as the Administrator may determine may be necessary to assure the faithful execution of his authorities and responsibilities under law) the authority vested in him under section 11 of the Energy Supply and Environmental Coordination Act of 1974 and section 13 of this Act and the Director may act in the name of the Administrator under section 12 of the Energy Supply and Environmental Coordination Act of 1974 and section 13 of this Act for the purpose of obtaining enforcement of the authorities delegated to him.

(c) As used in this Act the term "energy information" shall have the meaning described in section 11 of the Energy Supply and Environmental Coordination Act of 1974.

NATIONAL ENERGY INFORMATION SYSTEM

Sec. 52. (a) It shall be the duty of the Director to establish a National Energy Information System (hereinafter referred to in this Act as the "System"), which shall be operated and maintained by the Office. The System shall contain such information as is required to provide a description of and facilitate analysis of energy supply and consumption within and affecting the United States on the basis of such geographic areas and economic sectors as may be appropriate to meet adequately the needs of—

(1) the Federal Energy Administration in carrying out its lawful functions;

(2) the Congress; and

(3) other officers and employees of the United States in whom have been vested, or to whom have been delegated, energy-related policy decisionmaking responsibilities.

(b) At a minimum, the System shall contain such energy information as is necessary to carry out the Administration's statistical and forecasting activities, and shall include, at the earliest date and to the maximum extent practical subject to the resources available and the Director's ordering of those resources to meet the responsibilities of his Office, such energy information as is required to define and permit analysis of—

(1) the institutional structure of the energy supply system including patterns of ownership and control of mineral fuel and nonmineral energy resources and the production, distribution, and marketing of mineral fuels and electricity;

(2) the consumption of mineral fuels, nonmineral energy resources, and electricity by such classes, sectors, and regions as may be appropriate for the purposes of this Act;

(3) the sensitivity of energy resource reserves, exploration, development, production, transportation, and consumption to economic factors, environmental constraints, technological improvements, and substitutability of alternate energy sources;

(4) the comparability of energy information and statistics that are supplied by different sources;

(5) industrial, labor, and regional impacts of changes in patterns of energy supply and consumption;

(6) international aspects, economic and otherwise, of the evolving energy situation; and

(7) long-term relationships between energy supply and consumption in the United States and world communities.

ADMINISTRATIVE PROVISIONS

SEC. 53. (a) The Director of the Office shall receive compensation at the rate now or hereafter prescribed for offices and positions at level IV of the Executive Schedule as specified in section 5315 of title 5, United States Code.

(b) To carry out the functions of the Office, the Director, on behalf of the Administrator, is authorized to appoint and fixed the compensation of such professionally qualified employees as he deems necessary, including up to ten of the employees in grade GS–16, GS–17, or GS–18 authorized by section 7 of this Act.

(c) The functions and powers of the Office shall be vested in or delegated to the Director, who may from time to time, and to the extent permitted by law, consistent with the purposes of this Act, delegate such of his functions as he deems appropriate. Such delegation may be made, upon request, to any officer or agency of the Federal Government.

(d)(1) The Director shall be available to the Congress to provide testimony on such subjects under his authority and responsibility as the Congress may request, including but not limited to energy information and analyses thereof.

(2) Any request for appropriations for the Federal Energy Administration submitted to the Congress shall identify the portion of such request intended for the support of the Office, and a statement of the differences, if any, between the amounts requested and the Director's assessment of the budgetary needs of the Office.

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ANALYTICAL CAPABILITY

SEC. 54. (a) The Director shall establish and maintain the scientific, engineering, statistical, or other technical capability to perform analysis of energy information to—

(1) verify the accuracy of items of energy information submitted to the Director; and

(2) insure the coordination and comparability of the energy information in possession of the Office and other Federal agencies.

(b) The Director shall establish and maintain the professional and analytic capability to evaluate independently the adequacy and comprehensiveness of the energy information in possession of the Office and other agencies of the Federal Government in relation to the purposes of this Act and for the performance of the analyses described in section 52 of this Act. Such analytic capability shall include—

(1) expertise in economics, finance, and accounting;

(2) the capability to evaluate estimates of reserves of mineral fuels and nonmineral energy resources utilizing alternative methodologies;

(3) the development and evaluation of energy flow and accounting models describing the production, distribution, and consumption of energy by the various sectors of the economy and lines of commerce in the energy industry;

(4) the development and evaluation of alternative forecasting models describing the short- and long-term relationships between energy supply and consumption and appropriate variables; and

(5) such other capabilities as the Director deems necessary to achieve the purposes of this Act.

PROFESSIONAL AUDIT REVIEW OF PERFORMANCE OF OFFICE

SEC. 55. (a) The procedures and methodology of the Office shall be subject to a thorough annual performance audit review. Such review shall be conducted by a Professional Audit Review Team which shall prepare a report describing its investigation and reporting its findings to the President and to the Congress.

(b) The Professional Audit Review Team shall consist of at least seven professionally qualified persons who shall be officers or employees of the United States and of whom at least—

one shall be designated by the Chairman of the Council of Economic Advisers;

one shall be designated by the Commissioner of Labor Statistics;

one shall be designated by the Administrator of Social and Economic Statistics;

one shall be designated by the Chairman of the Securities and Exchange Commission;

one shall be designated by the Chairman of the Federal Trade Commission;

one shall be designated by the Chairman of the Federal Power Commission; and

one, who shall be the Chairman of the Professional Audit Review Team, shall be designated by the Comptroller General.

(c) The Director and the Administrator shall cooperate fully with the Professional Audit Review Team and notwithstanding any other provisions of law shall make available to the Team such data, information, documents, and services as the Team determines are necessary for successful completion of its performance audit review.

(d) Except as authorized by law, any person who—

(1) obtains, in the course of exercising the functions of the Professional Audit Review Team, information which constitutes a trade secret or confident commercial information, the disclosure of which could result in significant competitive injury to the person to which such information relates; and

(2) willfully discloses such information;

shall be fined not more than $40,000, or imprisoned not more than one year, or both.

COORDINATION OF ENERGY INFORMATION ACTIVITIES

SEC. 56. (a) In carrying out the purposes of this Act the Director shall, as he deems appropriate, review the energy information gathering activities of Federal agencies with a view toward avoiding duplication of effort and minimizing the compliance burden on business enterprises and other persons.

(b) In exercising his responsibilities under subsection (a) of this section, the Director shall recommend policies which, to the greatest extent practicable—

(1) provide adequately for the energy information needs of the various departments and agencies of the Federal Government, the Congress, and the public;

(2) minimize the burden of reporting energy information on businesses, other persons, and especially small businesses;

(3) reduce the cost to Government of obtaining information; and

(4) utilize files of information and existing facilities of established Federal agencies.

(c)(1) At the earliest practicable date after the date of enactment of this section, each Federal agency which is engaged in the gathering of energy information as a part of an established program, function, or other activity shall promptly provide the Administrator with a report on energy information which—

(A) identifies the statutory authority upon which the energy information collection activities of such agency is based;

(B) lists and describes the energy information needs and requirements of such agency; and

(C) lists and describes the categories, definitions, levels of detail, and frequency of collection of the energy information collected by such agency.

Such agencies shall cooperate with the Administrator and provide such other descriptive information with respect to energy information activities as the Administrator may request. The Administrator shall prepare a report of his activities under this subsection, which report shall include recommendations with respect to the coordination of energy information activities of the Federal Government. Such report

shall be available to the Congress and shall be transmitted to the President and to the Energy Resources Council for use in preparation of the plan required under subsection (c) of section 108 of the Energy Reorganization Act of 1974.

REPORTS

SEC. 57. (a) The Director shall make periodic reports and may make special reports to the Congress and the public, including but not limited to—

(1) such reports as the Director determines are necessary to provide a comprehensive picture of the quarterly, monthly, and, as appropriate, weekly supply and consumption of the various nonmineral energy resources, mineral fuels, and electricity in the United States; the information reported may be organized by company, by States, by regions, or by such other producing and consuming sectors, or combinations thereof, and shall be accompanied by an appropriate discussion of the evolution of the energy supply and consumption situation and such national and international trends and their effects as the Director may find to be significant; and

(2) an annual report which includes, but is not limited to, a description of the activities of the Office and the National Energy Information System during the preceding year; a summary of all special reports published during the preceding year; a summary of statistical information collected during the preceding year; short-, medium-, and long-term energy consumption and supply trends and forecasts under various assumptions; and, to the maximum extent practicable, a summary or schedule of the amounts of mineral fuel resources, nonmineral energy resources, and mineral fuels that can be brought to market at various prices and technologies and their relationship to forecasted demands.

(b) (1) The Director, on behalf of the Administrator, shall insure that adequate documentation for all statistical and forecast reports prepared by the Director is made available to the public at the time of publication of such reports. The Director shall periodically audit and validate analytical methodologies employed in the preparation of periodic statistical and forecast reports.

(2) The Director shall, on a regular basis, make available to the public information which contains validation and audits of periodic statistical and forecast reports.

(c) Prior to publication, the Director may not be required to obtain the approval of any other officer or employee of the United States with respect to the substance of any statistical or forecasting technical reports which he has prepared in accordance with the law.

ENERGY INFORMATION IN POSSESSION OF OTHER FEDERAL AGENCIES

SEC. 58. (a) In furtherance and not in limitation of any other authority, the Director, on behalf of the Administrator, shall have access to energy information in the possession of any Federal agency except information—

(1) the disclosure of which to another Federal agency is expressly prohibited by law; or

(2) the disclosure of which the agency so requested determines would significantly impair the discharge of authorities and responsibilities which have been delegated to, or vested by law, in such agency.

(b) In the event that energy information in the possession of another Federal agency which is required to achieve the purpose of this Act is denied the Director or the Administrator pursuant to paragraph (1) or paragraph (2) of subsection (a) of this section, the Administrator, or the Director, on behalf of the Administrator, shall take appropriate action, pursuant to authority granted by law, to obtain said information from the original sources or a suitable alternate source. Such source shall be notified of the reason for this request for information.

CONGRESSIONAL ACCESS TO INFORMATION IN POSSESSION OF THE OFFICE

SEC. 59. The Director shall promptly provide upon request any energy information in the possession of the Office to any duly established committee of the Congress. Such information shall be deemed the property of such committee and may not be disclosed except in accordance with the rules of such committee and the Rules of the House of Representatives or the Senate and as permitted by law.

ATTACHMENT 4

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT OF 1974
(PUBLIC LAW 93–319)

SEC. 11. REPORTING OF ENERGY INFORMATION

(a) For the purpose of assuring that the Federal Energy Administrator, the Congress, the States, and the public have access to and are able to obtain reliable energy information, the Federal Energy Administrator shall request, acquire, and collect such energy information as he determines to be necesary to assist in the formulation of energy policy or to carry out the purposes of this Act or the Emergency Petroleum Allocation Act of 1973. The Federal Energy Administrator shall promptly promulgate rules pursuant to subsection (b)(1)(A) of this section requiring reports of such information to be submitted to the Federal Energy Administrator at least every ninety calendar days.

(b)(1) In order to obtain energy information for the purpose of carrying out the provisions of subsection (a), the Federal Energy Administrator is authorized—

(A) to require, by rule, any person who is engaged in the production, processing, refining, transporation by pipeline, or distribution (at other than the retail level) of energy resources to submit reports;

(B) to sign and issue subpenas for the attendance and testimony of witnesses and the production of books, records, papers, and other documents;

(C) to require any person, by general or special order, to submit answers in writing to interrogatories, requests for reports or for other information; and such answers or other submissions shall be made within such reasonable period, and under oath or otherwise, as the Federal Energy Administrator may determine; and

(D) to administer oaths.

(2) For the purpose of verifying the accuracy of any energy information requested, acquired, or collected by the Federal Energy Administrator, the Federal Energy Administrator, or any officer or employer duly designated by him, upon presenting appropriate credentials and a written notice from the Federal Energy Administrator to the owner, operator, or agent in charge, may—

(A) enter, at reasonable times, any business premise or facility; and

(B) inspect, at reasonable times and in a reasonable manner, any such premise or facility, inventory and sample any stock of energy resources therein, and examine and copy books, records, papers, or other documents, relating to any such energy information.

(3) Any United States district court within the jurisdiction of which any inquiry is carried on may, upon petition by the Attorney General at the request of the Federal Energy Administrator, in the case of refusal to obey a subpena or order of the Federal Energy Administrator issued under this section, issue an order requiring compliance therewith; and any failure to obey the order of the court may be punished by the court as a contempt thereof.

(c)(1) The Federal Energy Administrator shall exercise the authorities granted to him under subsection (b)(1)(A) to develop, within thirty days after the date of enactment of this Act, as full and accurate a measure as is reasonably practicable of—

(A) domestic reserves and production;

(B) imports; and

(C) inventories;

of crude oil, residual fuel oil, refined petroleum products, natural gas, and coal.

(2) For each calendar quarter beginning with the first complete calendar quarter following the date of enactment of this Act, the Federal Energy Administrator shall develop and publish a report containing the following energy information:

(A) Imports of crude oil, residual fuel oil, refined petroleum products (by product), natural gas, and coal, identifying (with respect to each such oil product, gas, or coal) country of origin, arrival point, quantity received, and the geographic distribution within the United States.

(B) Domestic reserves and production of crude oil, natural gas, and coal.

(C) Refinery activities, showing for each refinery within the United States (i) the amounts of crude oil run by such refinery, (ii) amounts of crude oil allocated to such refinery pursuant to regulations and orders of the Federal Energy Administrator, his delegate pursuant to the Emergency Petroleum Allocation Act of 1973, or any other person authorized by law to issue regulations and orders with respect to the allocation of crude oil, (iii) percentage of refinery capacity utilized, and (iv) amounts of products refined from such crude oil.

(D) Report of inventories, on a national, regional, and State-by-State basis—

(i) of various refined petroleum products, relating refiners, refineries, suppliers to refiners, share of market, and allocation fractions;

(ii) of various refined petroleum products, previous quarter deliveries and anticipated three-month available supplies:

(iii) of anticipated monthly supply of refined petroleum products, amount of set-aside for assignment by the State, anticipated State requirements, excess or shortfall of supply, and allocation fraction of base year; and

(iv) of LPG by State and owner: quantities stored, and existing capacities, and previous priorities on types, inventories of suppliers, and changes in supplier inventories.

(3) In order to carry out his responsibilities under subsection (a) of this section, the Federal Energy Administrator shall require, pur-

suant to subsection (b)(1)(A) of this section, that persons engaged, in whole or in part, in the production of crude oil or natural gas—

(A) keep energy information in accordance with the accounting practices developed pursuant to section 503 of the Energy Policy and Conservation Act, and

(B) submit reports with respect to energy information kept in accordance with such practices.

The Administrator shall file quarterly reports with the President and the Congress compiled from accounts kept in accordance with such section 503 and submitted to the Administrator in accordance with this paragraph. Such reports shall present energy information in the categories specified in subsection (c) of such section 503 to the extent that such information may be compiled from such accounts. Such energy information shall be collected and such quarterly reports made for each calendar quarter which begins 6 months after the date on which the accounting practices developed pursuant to such section 503 are made effective.

(d) Upon a showing satisfactory to the Federal Energy Administrator by any person that any energy information obtained under this section from such person would, if made public, divulge methods or processes entitled to protection as trade secrets or other proprietary information of such person, such information, or portion thereof, shall be confidential in accordance with the provisions of section 1905 of title 18, United States Code; except that such information, or part thereof, shall not be deemed confidential for purposes of disclosure, upon request, to (1) any delegate of the Federal Energy Administrator for the purpose of carrying out this Act and the Emergency Petroleum Allocation Act of 1973, (2) the Attorney General, the Secretary of the Interior, the Federal Trade Commission, the Federal Power Commission, or the General Accounting Office, when necessary to carry out those agencies' duties and responsibilities, under this and other statutes, and (3) the Congress, or any committee of Congress upon request of the Chairman.

(e) As used in this section:

(1) The term "energy information" includes (A) all information in whatever form on (i) fuel reserves, exploration, extraction, and energy resources (including petrochemical feedstocks) wherever located; (ii) production, distribution, and consumption of energy and fuels wherever carried on; and (B) matters relating to energy and fuels, such as corporate structure and proprietary relationships, costs, prices, capital investment, and assets, and other matters directly related thereto, wherever they exist.

(2) The term "person" means any natural person, corporation, partnership, association, consortium, or any entity organized for a common business purpose, wherever situated, domiciled, or doing business, who directly or through other persons subject to their control does business in any part of the United States.

(3) The term "United States" when used in the geographical sense means the States, the District of Columbia, Puerto Rico, and the territories and possessions of the United States.

(f) Information obtained by the Administration under authority of this Act shall be available to the public in accordance with the provisions of section 552 of title 5, United States Code.

(g)(1) The authority contained in this section is in addition to, independent of, not limited by, and not in limitation of, any other authority of the Federal Energy Administrator.

(2) The provisions of this section expire at midnight, December 31, 1979, but such expiration shall not affect any administrative or judicial proceeding which relates to any act or failure to act if such act or failure to act was not in compliance with the requirements and authorities of this section and occurred prior to midnight, December 31, 1979.

SEC. 12. ENFORCEMENT.

(a) It shall be unwaful for any person to violate any provision of section 2 (relating to coal conversion and allocation) or section 11 (relating to energy information) or to violate any rule, regulation, or order issued pursuant to any such provision.

(b)(1) Whoever violates any provision of subsection (a) shall be subject to a civil penalty of not more than $2,500 for each violation.

(2) Whoever willfully violates any provision of subsection (a) shall be fined not more than $5,000 for each violation.

(3) It shall be unlawful for any person to offer for sale or distribute in commerce any coal in violation of an order or regulation issued pursuant to section 2(d). Any person who knowingly and willfully violates this paragraph after having been subjected to a civil penalty for a prior violation of the same provision of any order or regulation issued pursuant to section 2(d) shall be fined not more than $50,000 or imprisoned not more than six months, or both.

(4) Whenever it appears to the Federal Energy Administrator or any person authorized by the Federal Energy Administrator to exercise authority under this section 2 or section 11 of this Act that any individual or organization has engaged, is engaged, or is about to engage in acts or practices constituting a violation of subsection (a) the Federal Energy Administrator or such person may request the Attorney General to bring a civil action to enjoin such arts or practices, and upon a proper showing, a temporary restraining order or a preliminary or permanent injunction shall be granted without bond. In such action, the court may also issue mandatory injunctions commanding any person to comply with any provision, the violation of which is prohibited by subsection (a).

(5) Any person suffering legal wrong because of any act or practice arising out of any violation of subsection (a) may bring a civil action for appropriate relief, including an action for a declaratory judgment or writ of injunction. United States district courts shall have jurisdiction of actions under this paragraph without regard to the amount in controversy. Nothing in this paragraph shall authorize any person to recover damages.

ATTACHMENT 5

FEDERAL NONNUCLEAR ENERGY RESEARCH AND DEVELOPMENT ACT OF 1974 (PUBLIC LAW 93–577)

CENTRAL SOURCE OF NONNUCLEAR ENERGY INFORMATION

SEC. 17. The Administrator shall promptly establish, develop, acquire, and maintain a central source of information on all energy resources and technology in furtherance of the Administrator's research, development, and demonstration mission carried out directly or indirectly under this Act. When the Administrator determines that such information is needed to carry out the purposes of this Act, he may acquire proprietary and other information (a) by purchase through negotiation or by donation from any person, or (b) from another Federal agency. The information maintained by the Administrator shall be made available to the public, subject to the provisions of section 552 of title 5, United States Code, and section 1905 of title 18, United States Code, and to other Government agencies in a manner that will facilitate its dissemination: *Provided*, That upon a showing satisfactory to the Administrator by any person that any information, or portion thereof, obtained under this section by the Administrator directly or indirectly from such person, would, if made public, divulge (1) trade secrets or (2) other proprietary information of such person, the Administrator shall not disclose such information and disclosure thereof shall be punishable under section 1905 of title 18, United States Code: *Provided further*, That the Administrator shall, upon request, provide such information to (A) any delegate of the Administrator for the purpose of carrying out this Act, and (B) the Attorney General, the Secretary of Agriculture, the Secretary of the Interior, the Federal Trade Commission, the Federal Energy Administration, the Environmental Protection Agency, the Federal Power Commission, the General Accounting Office, other Federal agencies, when necessary to carry out their duties and responsibilities under this and other statutes, but such agencies and agency heads shall not release such information to the public. This section is not authority to withhold information from Congress or any committee of Congress upon request of the chairman.

ENERGY INFORMATION

SEC. 18. The Administrator is, upon request, authorized to obtain energy information under section 11(d) of the Energy Supply and Environmental Coordination Act of 1974, as amended (15 U.S.C. 796 (d)).

Attachment 6

Energy Policy and Conservation Act (Public Law 94–163)

EXCHANGE OF INFORMATION

SEC. 254. (a)(1) Except as provided in subsection (b) and (c), the Administrator, after consultation with the Attorney General, may provide to the Secretary of State, and the Secretary of State may transmit to the International Energy Agency established by the international energy program, the information and data related to the energy industry certified by the Secretary of State as required to be submitted under the international energy program.

(2)(A) Except as provided in subparagraph (B) of this paragraph, any such information or data which is geological or geophysical information or a trade secret or commercial or financial information to which section 552(b)(9) or (b)(4) of title 5, United States Code, applies shall, prior to such transmittal, be aggregated, accumulated, or otherwise reported in such manner as to avoid, to the fullest extent feasible, identification of any person from whom the United States obtained such information or data, and in the case of geological or geophysical information, a competitive disadvantage to such person.

(B)(i) Notwithstanding subparagraph (A) of this paragraph, during an international energy supply emergency, any such information or data with respect to the international allocation of petroleum products may be made available to the International Energy Agency if otherwise authorized to be made available to such Agency by paragraph (1) of this subsection.

(ii) Subparagraph (A) shall not apply to information described in subparagraph (A) (other than geological or geophysical information) if the President certifies, after opportunity for presentation of views by interested persons that the International Energy Agency has adopted and is implementing security measures which assure that such information will not be disclosed by such Agency or its employees to any person or foreign country without having been aggregated, accumulated, or otherwise reported in such manner as to avoid identification of any person from whom the United States obtained such information or data.

(3)(A) Within 90 days after the date of enactment of this Act, and periodically thereafter, the President shall review the operation of this section and shall determine whether other signatory nations to the international energy program are transmitting information and data to the International Energy Agency in substantial compliance with such program. If the President determines that other nations are not so complying, paragraph (2)(B)(ii) shall not apply until he determines other nations are so complying.

(B) Any person who believes he has been or will be damaged by the transmittal of information or data pursuant to this section shall have the right to petition the President and to request changes in procedures which will protect such person from any competitive damage.

(b) If the President determines that the transmittal of data or information pursuant to the authority of this section would prejudice competition, violate the antitrust laws, or be inconsistent with United States national security interests, he may require that such data or information not be transmitted.

(c) Information and data the confidentiality of which is protected by statute shall not be provided by the Administrator to the Secretary of State under subsection (a) of this section for transmittal to the International Energy Agency, unless the Administrator has obtained the specific concurrence of the head of any department or agency which has the primary statutory authority for the collection, gathering, or obtaining of such information and data. In making a determination to concur in providing such information and data, the head of any department or agency which has the primary statutory authority for the collection, gathering, or obtaining of such information and data shall consider the purposes for which such information and data were collected, gathered, and obtained, the confidentiality provisions of such statutory authority, and the international obligations of the United States under the international energy program with respect to the transmittal of such information and data to an international organization or foreign country.

(d) For the purposes of carrying out the obligations of the United States under the international energy program, the authority to collect data granted by sections 11 and 13 of the Energy Supply and Environmental Coordination Act and the Federal Energy Administration Act of 1974, respectively, shall continue in full force and effect without regard to the provisions of such Acts relating to their expiration.

(e) The authority under this section to transmit information shall be subject to any limitations on disclosure contained in other laws, except that such authority may be exercised without regard to—

(1) section 11(d) of the Energy Supply and Environmental Coordination Act of 1974;

(2) section 14(b) of the Federal Energy Administration Act of 1974;

(3) section 7 of the Export Administration Act of 1969;

(4) section 9 of title 13, United States Code;

(5) section 1 of the Act of January 27, 1938 (15 U.S.C. 176(a)); and

(6) section 1905 of title 18, United States Code.

* * * * * * *

AUTHORITY TO OBTAIN INFORMATION

SEC. 329. (a) For purposes of carrying out this part, the Commission and the Administrator may each sign and issue subpenas for the attendance and testimony of witnesses and the production of relevant books, records, papers, and other documents, and may each administer oaths. Witnesses summoned under the provisions of this section shall

be paid the same fees and mileage as are paid to witnesses in the courts of the United States. In case of contumacy by, or refusal to obey a subpena served, upon any persons subject to this part, the Commission and the Administrator may each seek an order from the district court of the United States for any district in which such person is found or resides or transacts business requiring such person to appear and give testimony, or to appear and produce documents. Failure to obey any such order is punishable by such court as a contempt thereof.

(b) Any information submitted by any person to the Administrator or the Commission under this part shall not be considered energy information as defined by section 11(e)(1) of the Energy Supply and Environmental Coordination Act of 1974 for purposes of any verification examination authorized to be conducted by the Comptroller General under section 501 of this Act.

* * * * * * *

PART A—ENERGY DATA BASE AND ENERGY INFORMATION

VERIFICATION EXAMINATION

SEC. 501. (a) The Comptroller General may conduct verification examinations with respect to the books, records, papers, or other documents of—

(1) any person who is required to submit energy information to the Federal Energy Administration, the Department of the Interior, or the Federal Power Commission pursuant to any rule, regulation, order, or other legal procses of such Administration, Department or Commission;

(2) any person who is engaged in the production, processing, refining, transportation by pipeline, or distribution (at other than the retail level) of energy resources—

(A) if such person has furnished, directly or indirectly, energy information (without regard to whether such information was furnished pursuant to legal requirements) to any Federal agency (other than the Internal Revenue Service), and

(B) if the Comptroller General of the United States determines that such information has been or is being used or taken into consideration, in whole or in part, by a Federal agency in carrying out responsibilities committed to such agency; or

(3) any vertically integrated petroleum company with respect to financial information of such company related to energy resource exploration, development, and production and the transportation, refining and marketing of energy resources and energy products.

(b) The Comptroller General shall conduct verification examinations of any person or company described in subsection (a), if requested to do so by any duly established committee of the Congress having legislative or oversight responsibilties under the rules of the House of Representatives or of the Senate, with respect to energy matters or any of the laws administered by the Department of the

Interior (or the Secretary thereof), the Federal Power Commission, or the Federal Energy Administration (or the Administator).

(c) For the purposes of this title—

(1) The term "verification examination" means an examination of such books, records, papers, or other documents of a person or company as the Comptroller General determines necessary and appropriate to assess the accuracy, reliability, and adequacy of the energy information, or financial information, referred to in subsection (a).

(2) The term "energy information" has the same meaning as such term has in section 11(e)(1) of the Energy Supply and Environmental Coordination Act of 1974.

(3) The term "person" has the same meaning as such term has in section 11(c)(2) of the Energy Supply and Environmental Coordination Act of 1974.

(4) The term "vertically integrated petroleum company" means any person which itself, or through a person which is controlled by, controls, or is under common control with such person, is engaged in the production, refining, and marketing of petroleum products.

POWERS OF THE COMPTROLLER GENERAL AND REPORTS

SEC. 502. (a) For the purpose of carrying out his authority under section 501—

(1) the Comptroller General may—

(A) sign and issue subpenas for the attendance and testimony of witnesses and the production of books, records, papers, and other documents;

(B) require any person, by general or special order, to submit answers in writing to interrogatories, to submit books, records, papers, or other documents, or to submit any other information or reports, and such answers or other submissions shall be made within such reasonable period, and under oath or otherwise, as the Comptroller General may determine; and

(C) administer oaths.

(2) the Comptroller General, or any officer or employee duly designated by the Comptroller General, upon presenting appropriate credentials and a written notice from the Comptroller General to the owner, operator, or agent in charge, may—

(A) enter, at reasonable times, any business premise or facility; and

(B) inspect, at reasonable times and in a reasonable manner, any such premise or facility, inventory and sample any stock of energy resources therein, and examine and copy books, records, papers, or other documents, relating to any energy information, or any financial information in the case of a vertically integrated petroleum company.

(b) The Comptroller General shall have access to any energy information within the possession of any Federal agency (other than the Internal Revenue Service) as is necessary to carry out his authority under this section.

(c) (1) Except as provided in subsections (d) and (e), the Comptroller General shall transmit a copy of the results of any verification examination conducted under section 501 to the Federal agency to which energy information which was subject to such examination was furnished.

(2) Any report made pursuant to paragraph (1) shall include the Comptroller General's findings with respect to the accuracy, reliability, and adequacy of the energy information which was the subject of such examination.

(d) If the verification examination was conducted at the request of any committee of the Congress, the Comptroller General shall report his findings as to the accuracy, reliability, or adequacy of the energy information which was the subject of such examination, or financial information in the case of a vertically integrated petroleum company, directly to such committee of the Congress and any such information obtained and such report shall be deemed the property of such committee and may not be disclosed except in accordance with the rules of the committee and the rules of the House of Representatives or the Senate and as permitted by law.

(e) (1) Any information obtained by the Comptroller General or any officer or employee of the General Accounting Office pursuant to the exercise of responsibilities or authorities under this section which relates to geological or geophysical information, or any estimate or interpretation thereof, the disclosure of which would result in significant competitive disadvantage or significant loss to the owner thereof shall not be disclosed except to a committee of Congress. Any such information so furnished to a committee of the Congress shall be deemed the property of such committee and may not be disclosed except in accordance with the rules of the committee and the rules of the House of Representatives or the Senate and as permitted by law.

(2) Any person who knowingly discloses information in violation of paragraph (1) shall be subject to the penalties specified in section 5(a) (3) (B) and (4) of the Emergency Petroleum Allocation Act of 1973, as amended by section 452 of this Act.

(f) The Comptroller General shall prepare and submit to the Congress an annual report with respect to the exercise of its authorities under this part, which report shall specifically identify any deficiencies in energy information or financial information reviewed by the Comptroller General and include a discussion of action taken by the person or company so examined, if any, to correct any such deficiencies.

ACCOUNTING PRACTICES

SEC. 503. (a) For purposes of developing a reliable energy data base related to the production of crude oil and natural gas, the Securities and Exchange Commission shall take such steps as may be necessary to assure the development and observance of accounting practices to be followed in the preparation of accounts by persons engaged, in whole or in part, in the production of crude oil or natural gas in the United States. Such practices shall be developed not later than 24 months after the date of enactment of this Act and shall take effect with respect to the fiscal year of each such person which begins 3 months

after the date on which such practices are prescribed or made effective under authority of subsection (b) (2).

(b) In carrying out its responsibilities under subsection (a), the Securities and Exchange Commission shall—

(1) consult with the Federal Energy Administration, the General accounting Office, and the Federal Power Commssion with respect to accounting practices to be developed under subsection (a), and

(2) have authority to prescribe rules applicable to persons engaged in the production of crude oil or natural gas, or make effective by recognition, or by other appropriate means indicating a determination to rely on, accounting practices developed by the Financial Accounting Standards Board, if the Securities and Exchange Commission is assured that such practice will be observed by persons engaged in the production of crude oil or natural gas to the same extent as would result if the Securities and Exchange Commission had prescribed such practices by rule.

The Securities and Exchange Commission shall afford interested persons an opportunity to submit written comment with respect to whether it should exercise its discretion to recognize or otherwise rely on such accounting practice in lieu of prescribing such practices by rule and may extend the 24-month period referred to in subsection (a) as it determines may be necessary to allow for a meaningful comment period with respect to such determination.

(c) The Securities and Exchange Commission shall assure that accounting practices developed pursuant to this section, to the greatest extent practicable, permit the compilation, treating domestic and foreign operations as separate categories, of an energy data base consisting of:

(1) The separate calculation of capital, revenue, and operating cost information pertaining to—

(A) prospecting,
(B) acquisition,
(C) exploration,
(D) development, and
(E) production,

including geological and geophysical costs, carrying costs, unsuccessful exploratory drilling costs, intangible drilling and development costs on productive wells, the cost of unsuccessful development wells, and the cost of acquiring oil and gas reserves by means other than development. Any such calculation shall take into account disposition capitalized costs, contractual arrangements involving special conveyance of rights and joint operations, differences between book and tax income, and prices used in the transfer of products or other assets from one person to any other person, including a person controlled by controlling or under common control with such person.

(2) The full presentation of the financial information of persons engaged in the production of crude oil or natural gas, including—

(A) disclosure of reserves and operating activities, both domestic and foreign, to facilitate evaluation of financial effort and result; and

(B) classification of financial information by function to facilitate correlation with reserve and operating statistics, both domestic and foreign.

(3) Such other information, projections, and relationships of collected data as shall be necessary to facilitate the compilation of such data base.

ENFORCEMENT

SEC. 504. (a) Any person who violates any general or special order of the Comptroller General issued under section 502(a)(1)(B) of this Act may be assessed a civil penalty not to exceed $10,000 for each violation. Each day of failure to comply with such an order shall be deemed a separate violation. Such penalty shall be assessed by the Comptroller General and collected in a civil action brought by the Comptroller General through any attorney employed by the General Accounting Office or any other attorney designated by the Comptroller General, or, upon request of the Comptroller General, the Attorney General. A person shall not be liable with respect to any period during which the effectiveness of the order with respect to such person was stayed.

(b) Any action to enjoin or set aside an order issued under section 502(a)(1)(B) may be brought only before the United States Court of Appeals for the District of Columbia. Any action to collect a civil penalty for violation of any general or special order may be brought only in the United States District Court for the District of Columbia. In any action brought under subsection (a) to collect a civil penalty, process may be served in any judicial district of the United States.

(c) Upon petition by the Comptroller General through any attorney employed by the General Accounting Office or designated by the Comptroller General, or, upon request of the Comptroller General, the Attorney General, any United States district court within the jurisdiction of which any inquiry under this part is carried or may, in the case of refusal to obey a subpena of the Comptroller General issued under this part, issue an order requiring compliance therewith; and any failure to obey the order of the court may be treated the court as a contempt thereof.

AMENDMENT TO ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT OF 1974

SEC. 505. (a) Section 11(c) of The Energy Supply and Environmental Coordination Act of 1974 is amended by adding at the end thereof the following:

"(3) In order to carry out his responsibilities under subsection (a) of this section, the Federal Energy Administrator shall require, pursuant to subsection (b)(1)(A) of this section, that persons engaged, in whole or in part, in the production of crude oil or natural gas—

"(A) keep energy information in accordance with the accounting practices developed pursuant to section 503 of the Energy Policy and Conservation Act, and

"(B) submit reports with respect to energy information kept in accordance with such practices.

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The Administrator shall file quarterly reports with the President and the Congress compiled from accounts kept in accordance with such section 503 and submitted to the Administrator in accordance with this paragraph. Such reports shall present energy information in the categories specified in subsection (c) of such section 503 to the extent that such information may be compiled from such accounts. Such energy information shall be collected and such quarterly reports made for each calendar quarter which begins 6 months after the date on which the accounting practices developed pursuant to such section 503 are made effective.".

(b) The amendment made by subsection (a) to section 11(c) of the Energy Supply and Environmental Coordination Act of 1974 shall take effect on the first day of the first accounting quarter to which such practices apply.

EXTENSION OF ENERGY INFORMATION GATHERING AUTHORITY

SEC. 506. Section 11(g)(2) of the Energy Supply and Environmental Coordination Act of 1974 is amended by striking out "June 30, 1975" wherever it appears and inserting in lieu thereof "December 31, 1979".

Attachment 7

The Federal Power Act

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled . . . That a commission is hereby created and established, to be known as the Federal Power Commission (hereinafter referred to as the "commission") which shall be composed of five commissioners who shall be appointed by the President, by and with the advice and consent of the Senate, one of whom shall be designated by the President as chairman and shall be the principal executive officer of the commission:

* * * * * * *

Sec. 4. [*As amended August 26, 1935.*] The Commission is hereby authorized and empowered—

(a) To make investigations and to collect and record data concerning the utilization of the water resources of any region to be developed, the water-power industry and its relation to other industries and to interstate or foreign commerce, and concerning the location, capacity, development costs, and relation to markets of power sites, and whether the power from Government dams can, be advantageously used by the United States for its public purposes, and what is a fair value of such power, to the extent the Commission may deem necessary or useful for the purposes of this Act. [41 Stat. 1065; 49 Stat. 839; 16 U.S.C. 797(a)]

(b) To determine the actual legitimate original cost of and the net investment in a licensed project, and to aid the Commission in such determinations, each licensee shall, upon oath, within a reasonable period of time to be fixed by the Commission, after the construction of the original project or any addition thereto or betterment thereof, file with the Commission in such detail as the Commission may require, a statement in duplicate showing the actual legitimate original cost of construction of such project, addition, or betterment, and of the price paid for water rights, rights-of-way, lands, or interest in lands. The licensee shall grant to the Commission or to its duly authorized agent or agents, at all reasonable times, free access to such project, addition, or betterment, and to all maps, profiles, contracts, reports of engineers, accounts, books, records, and all other papers and documents relating thereto. The statement of actual legitimate original cost of said project, and revisions thereof as determined by the Commission, shall be filed with the Secretary of the Treasury. [41 Stat. 1065; 49 Stat. 839–840; 16 U.S.C. 797(b)]

(c) To cooperate with the executive departments and other agencies of State or National Governments in such investigations; and for such purpose the several departments and agencies of the National Government are authorized and directed upon the request of the Commission

to furnish such records, papers, and information in their possession as may be requested by the Commission, and temporarily to detail to the Commission such officers or experts as may be necessary in such investigations. [41 Stat. 1065; 49 Stat. 840; 16 U.S.C. 797(c)]

(d) To make public from time to time the information secured hereunder and to provide for the publication of its reports and investigations in such form and manner as may be best adapted for public information and use.

* * * * * * *

ACCOUNTS, RECORDS, AND MEMORANDA

SECTION 301. (a) Every licensee and public utility shall make, keep and preserve for such periods, such accounts, records of cost-accounting procedures, correspondence, memoranda, papers, books, and other records as the Commission may by rules and regulations prescribe as necessary or appropriate for purposes of the administration of this Act, including accounts, records, and memoranda of the generation, transmission, distribution, delivery, or sale of electric energy, the furnishing of services or facilities in connection therewith, and receipts and expenditures with respect to any of the foregoing: *Provided, however*, That nothing in this Act shall relieve any public utility from keeping any accounts, memoranda, or records which such public utility may be required to keep by or under authority of the laws of any State. The Commission may prescribe a system of accounts to be kept by licensees and public utilities and may classify such licensees and public utilities and prescribe a system of accounts for each class. The Commission, after notice and opportunity for hearing, may determine by order the accounts in which particular outlays and receipts shall be entered, charged, or credited. The burden of proof to justify every accounting entry questioned by the Commission shall be on the person making, authorizing, or requiring such entry, and the Commission may suspend a charge or credit pending submission of satisfactory proof in support thereof. [49 Stat. 854; 16 U.S.C. 825(a)]

(b) The Commission shall at all times have access to and the right to inspect and examine all accounts, records, and memoranda of licensees and public utilities, and it shall be the duty of such licensees and public utilities to furnish to the Commission, within such reasonable time as the Commission may order, any information with respect thereto which the Commission may by order require, including copies of maps, contracts, reports of engineers, and other data, records, and papers, and to grant to all agents of the Commission free access to its property and its accounts, records, and memoranda when requested so to do. No member, officer, or employee of the Commission shall divulge any fact or information which may come to his knowledge during the course of examination of books or other accounts, as hereinbefore provided, except insofar as he may be directed by the Commission or by a court. [49 Stat. 854; 16 U.S.C. 825(b)]

(c) The books, accounts, memoranda, and records of any person who controls, directly or indirectly, a licensee or public utility subject to the jurisdiction of the Commission, and of any other company controlled by such person, insofar as they relate to transactions with or

the business of such licensee or public utility, shall be subject to examination on the order of the Commission. [49 Stat. 854; 16 U.S.C. 825(c)]

* * * * * * *

INVESTIGATION RELATING TO ELECTRIC ENERGY

SEC. 311. In order to secure information necessary or appropriate as a basis for recommending legislation, the Commission is authorized and directed to conduct investigations regarding the generation, transmission, distribution, and sale of electric energy, however produced, throughout the United States and its possessions, whether or not otherwise subject to the jurisdiction of the Commission, including the generation, transmission, distribution, and sale of electric energy by any agency, authority, or instrumentality of the United States, or of any State or municipality or other political subdivision of a State. It shall, so far as practicable, secure and keep current information regarding the ownership, operation, management, and control of all facilities for such generation, transmission, distribution, and sale; the capacity and output thereof and the relationship between the two; the cost of generation, transmission, and distribution; the rates, charges, and contracts in respect of the sale of electric energy and its service to residential, rural, commercial, and industrial consumers and other purchasers by private and public agencies; and the relation of any or all such facts to the development of navigation, industry, commerce, and the national defense. The Commission shall report to Congress the results of investigations made under authority of this section. [49 Stat. 859; 16 U.S.C. 825j]

* * * * * * *

ENFORCEMENT OF ACT, REGULATIONS AND ORDERS

SEC. 314. (a) Whenever it shall appear to the Commission that any person is engaged or about to engage in any acts or practices which constitute or will constitute a violation of the provisions of this Act, or of any rule, regulation, or order thereunder, it may in its discretion bring an action in the proper District Court of the United States, the Supreme Court of the District of Columbia, or the United States courts of any Territory or other place subject to the jurisdiction of the United States, to enjoin such acts or practices and to enforce compliance with this Act or any rule, regulation, or order thereunder, and upon a proper showing a permanent or temporary injunction or decree or restraining order shall be granted without bond. The Commission may transmit such evidence as may be available concerning such acts or practices to the Attorney General, who, in his discretion, may institute the necessary criminal proceedings under this Act. [49 State. 861; 16 U.S.C. 825m(a)]

Attachment 8

Natural Gas Act (Public Law 75–688)

NECESSARY FOR REGULATION OF NATURAL-GAS COMPANIES

Section 1. (a) As disclosed in reports of the Federal Trade Commission made pursuant to Senate Resolution 83 (Seventieth Congress, first session) and other reports made pursuant to the authority of Congress, it is hereby declared that the business of transporting and selling natural gas for ultimate distribution to the public is affected with a public interest, and that Federal regulation in matters relating to the transportation of natural gas and the sale thereof in interstate and foreign commerce is necessary in the public interest. [52 Stat. 821 (1938); 15 U.S.C. § 717(a)]

(b) The provisions of this act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural-gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas. [52 Stat. 821 (1938); 15 U.S.C. § 717 (b)]

Sec. 5. (b) The Commission upon its own motion, or upon the request of any State commission, whenever it can do so without prejudice to the efficient and proper conduct of its affairs, may investigate and determine the cost of the production or transportation of natural gas by a natural-gas company in cases where the Commission has no authority to establish a rate governing the transportation or sale of such natural gas. [52 Stat. 823 (1938); 15 U.S.C. § 717d]

* * * * * * *

ASCERTAINMENT OF COST OF PROPERTY

Sec. 6. (a) The Commission may investigate and ascertain the actual legitimate cost of the property of every natural-gas company, the depreciation therein, and, when found necessary for rate-making purposes, other facts which bear on the determination of such cost or depreciation and the fair value of such property.

(b) Every natural-gas company upon request shall file with the Commission an inventory of all or any part of its property and a statement of the original cost thereof, and shall keep the Commission informed regarding the cost of all additions, betterments, extensions, and new construction. [52 Stat. 824 (1938); 15 U.S.C. § 717e]

ACCOUNTS, RECORDS, AND MEMORANDA

SEC. 8. (a) Every natural-gas company shall make, keep, and preserve for such periods, such accounts, records of cost-accounting procedures, correspondence, memoranda, papers, books, and other records as the Commission may by rules and regulations prescribe as necessary or appropriate for purposes of the administration of this act: *Provided, however*, That nothing in this act shall relieve any such natural-gas company from keeping any accounts, memoranda, or records which such natural-gas company may be required to keep by or under authority of the laws of any State. The Commission may prescribe a system of accounts to be kept by such natural-gas companies, and may classify such natural-gas companies and prescribe a system of accounts for each class. The Commission, after notice and opportunity for hearing, may determine by order the accounts in which particular outlays or receipts shall be entered, charged, or credited. The burden of proof to justify every accounting entry questioned by the Commission shall be on the person making, authorizing, or requiring such entry, and the Commission may suspend a charge or credit pending submission of satisfactory proof in support thereof.

(b) The Commission shall at all times have access to and the right to inspect and examine all accounts, records, and memoranda of natural-gas companies; and it shall be the duty of such natural-gas companies to furnish to the Commission, within such reasonable time as the Commission may order, any information with respect thereto which the Commission may by order require, including copies of maps, contracts, reports of engineers, and other data, records, and papers, and to grant to all agents of the Commission free access to its property and its accounts, records, and memoranda when requested so to do. No member, officer, or employee of the Commission shall divulge any fact or information which may come to his knowledge during the course of examination of books, records, data, or accounts, except insofar as he may be directed by the Commission or by a court.

(c) The books, accounts, memoranda, and records of any person who controls directly or indirectly a natural-gas company subject to the jurisdiction of the Commission and of any other company controlled by such person, insofar as they relate to transactions with or the business of such natural-gas company, shall be subject to examination on the order of the Commission. [52 Stat. 825 (1938); 15 U.S.C. § 717g]

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PERIODIC AND SPECIAL REPORTS

SEC. 10. (a) Every natural-gas company shall file with the Commission such annual and other periodic or special reports as the Commission may by rules and regulations or order prescribe as necessary or appropriate to assist the Commission in the proper administration of this act. The Commission may prescribe the manner and form in which such reports shall be made, and require from such natural-gas companies specific answers to all questions upon which the Commission may need information. The Commission may require that such reports shall include, among other things, full information as to assets and liabilities, capitalization, investment and reduction thereof, gross

receipts, interest due and paid, depreciation, amortization, and other reserves, cost of facilities, cost of maintenance and operation of facilities for the production, transportation, or sale of natural gas, cost of renewal and replacement of such facilities, transportation, delivery, use, and sale of natural gas. The Commission may require any such natural-gas company to make adequate provision for currently determining such costs and other facts. Such reports shall be made under oath unless the Commission otherwise specifies.

(b) It shall be unlawful for any natural-gas company willfully to hinder, delay, or obstruct the making, filing, or keeping of any information, document, report, memorandum, record, or account required to be made, filed, or kept under this act or any rule, regulation, or order thereunder. [52 Stat. 826 (1938); 15 U.S.C. § 717i]

STATE COMPACTS; REPORTS ON

SEC. 11. (a) In case two or more States propose to the Congress compacts dealing with the conservation, production, transportation, or distribution of natural gas it shall be the duty of the Commission to assemble pertinent information relative to the matters covered in any such proposed compact, to make public and to report to the Congress information so obtained, together with such recommendations for further legislation as may appear to be appropriate or necessary to carry out the purposes of such proposed compact and to aid in the conservation of natural-gas resources within the United States and the orderly, equitable, and economic production, transportation, and distribution of natural gas.

(b) It shall be the duty of the Commission to assemble and keep current pertinent information relative to the effect and operation of any compact between two or more States heretofore or hereafter approved by the Congress, to make such information public, and to report to the Congress, from time to time, the information so obtained together with such recommendations as may appear to be appropriate or necessary to promote the purposes of such compact.

(c) In carrying out the purposes of this act, the Commission shall, so far as practicable, avail itself of the services, records, reports, and information of the executive departments and other agencies of the Government, and the President may, from time to time, direct that such services and facilities be made available to the Commission. [52 Stat. 827 (1938); 15 U.S.C. § 717j]

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INVESTIGATIONS BY COMMISSION; ATTENDANCE OF WITNESSES; DEPOSITIONS

SEC. 14. (a) The Commission may investigate any facts, conditions, practices, or matters which it may find necessary or proper in order to determine whether any person has violated or is about to violate any provision of this act or any rule, regulation, or order thereunder, or to aid in the enforcement of the provisions of this act or in prescribing rules or regulations thereunder, or in obtaining information to serve as a basis for recommending further legislation to the Congress. The Commission may permit any person to file with it a statement in writing, under oath or otherwise, as it shall determine, as to any or

all facts and circumstances concerning a matter which may be the subject of investigation. The Commission, in its discretion, may publish in the manner authorized by section 312 of the Federal Power Act, and make available to State commissions and municipalities, information concerning any such matter.

(b) The Commission may, after hearing, determine the adequacy or inadequacy of the gas reserves held or controlled by any natural-gas company, or by anyone on its behalf, including its owned or leased properties or royalty contracts; and may also, after hearing, determine the propriety and reasonableness of the inclusion in operating expenses, capital, or surplus of all delay rentals or other forms of rental or compensation for unoperated lands and leases. For the purpose of such determinations, the Commission may require any natural-gas company to file with the Commission true copies of all its lease and royalty agreements with respect to such gas reserves.

(c) For the purpose of any investigation or any other proceeding under this act, any member of the Commission, or any officer designated by it, is empowered to administer oaths and affirmations, subpena witnesses, compel their attendance, take evidence, and require the production of any books, papers, correspondence, memoranda, contracts, agreements, or other records which the Commission finds relevant or material to the inquiry. Such attendance of witnesses and the production of any such records may be required from any place in the United States or at any designated place of hearing. Witnesses summoned by the Commission to appear before it shall be paid the same fees and mileage that are paid witnesses in the courts of the United States.

(d) In case of contumacy by, or refusal to obey a subpena issued to, any person, the Commission may invoke the aid of any court of the United States within the jurisdiction of which such investigation or proceeding is carried on, or where such person resides or carries on business in requiring the attendance and testimony of witnesses and the production of books, papers, correspondence, memoranda, contracts, agreements, and other records. Such court may issue an order requiring such person to appear before the Commission or member or officer designated by the Commission, there to produce records, if so ordered, or to give testimony touching the matter under investigation or in question; and any failure to obey such order of the court may be punished by such court as a contempt thereof. All process in any such case may be served in the judicial district whereof such person is an inhabitant or wherever he may be found or may be doing business. Any person who willfully shall fail or refuse to attend and testify or to answer any lawful inquiry or to produce books, papers, correspondence, memoranda, contracts, agreements, or other records, if in his or its power so to do, in obedience to the subpena of the Commission, shall be guilty of a misdemeanor and upon conviction shall be subject to a fine or not more than $1,000 or to imprisonment for a term of not more than one year, or both.

(e) The testimony of any witness may be taken at the instance of a party, in any proceeding or investigation pending before the Commission, by deposition at any time after the proceeding is at issue. The Commission may also order testimony to be taken by deposition in any

proceeding or investigation pending before it at any stage of such proceeding or investigation. Such depositions may be taken before any person authorized to administer oaths not being of counsel or attorney to either of the parties, nor interested in the proceeding or investigation. Reasonable notice must first be given in writing by the party or his attorney proposing to take such deposition to the opposite party or his attorney of record, as either may be nearest, which notice shall state the name of the witness and the time and place of the taking of his deposition. Any person may be compelled to appear and depose, and to produce documentary evidence, in the same manner as witnesses may be compelled to appear and testify and produce documentary evidence before the Commission, as hereinbefore provided. Such testimony shall be reduced to writing by the person taking deposition, or under his direction, and shall, after it has been reduced to writing, be subscribed by the deponent.

(f) If a witness whose testimony may be desired to be taken by deposition be in a foreign country, the deposition may be taken before an officer or person designated by the Commission, or agreed upon by the parties by stipulation in writing to be filed with the Commission. All depositions must be promptly filed with the Commission.

(g) Witnesses whose depositions are taken as authorized in this act, and the person of officer taking the same, shall be entitled to the same fees as are paid for like services in the courts of the United States.

Attachment 9

Emergency Energy Conservation Act of 1979 (Public Law 96–102)

SEC. 241. STUDIES

(a) Study of Commercial and Industrial Storage of Fuel.—Not later than 180 days after the date of the enactment of this part, the Secretary shall conduct a study and report to the Congress regarding the commercial and industrial storage of gasoline and middle distillates (other than storage in facilities which have capacities of less than 500 gallons or storage used exclusively and directly for agricultural, residential, petroleum refining, or pipeline transportation purposes).

(b) Contents of Report.—Such report shall—

(1) indicate to what extent storage activities have increased since November 1, 1978, and what business establishments (including utilities) have been involved;

(2) the estimated amount of gasoline and middle distillates (in the aggregate and by type and region) which are in storage within the United States at the time of the study, the amounts which were in storage at the same time during the calendar year preceding the study, and the purposes for which such storage is maintained; and

(3) contain such findings and recommendations for legislation and administrative action as the Secretary considers appropriate, including recommendations for improving the availability and quality of data concerning such storage.

SEC. 242. MIDDLE DISTILLATE MONITORING PROGRAM

(a) Monitoring Program.—(1) Not later than 60 days after the date of the enactment of this Act, the Secretary shall establish and maintain a data collection program for monitoring, at the refining, wholesale, and retail levels, the supply and demand levels of middle distillates on a periodic basis in each State.

(2) The program to be established under paragraph (1) shall provide for—

(A) the prompt collection of relevant demand and supply data under the authority available to the Secretary under other law; and

(B) the submission to Congress of periodic reports each containing a concise narrative analysis of the most recent data which the Secretary determines are accurate, and a discussion on a State-by-State basis of trends in such data which the Secretary determines are significant.

(3) All data and information collected under this program shall be available to the Congress and committees of the Congress, and, in accordance with otherwise applicable law, to appropriate State and Federal agencies and the public.

(4) Nothing in this subsection authorizes the direct or indirect regulation of the price of any middle distillate.

(5) For purposes of this section, the term "middle distillate" has the same meaning as given that term in section 211.51 of title 10, Code of Federal Regulations, as in effect on the date of the enactment of this section.

(b) REPORT.—Before December 31, 1979, the President shall submit a report to Congress in which the President shall examine the middle distillate situation, summarizing the data, information, and analyses described in subsection (a) and discussing in detail matters required to be addressed in findings made pursuant to section 12(d)(1) of the Emergency Petroleum Allocation Act of 1973 (15 U.S.C. 760(d)(1)).

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SEC. 251. ADMINISTRATION

(a) INFORMATION.—(1) The Secretary shall use the authority provided under section 11 of the Energy Supply and Environmental Coordination Act of 1974 for the collection of such information as may be necessary for the enforcement of the provisions of parts A and B of this title.

(2) In carrying out his responsibilities under this title, the Secretary shall insure that timely and adequate information concerning the supplies, pricing, and distribution of motor fuels (and other energy sources which are the subject of targets in effect under section 211) is obtained, analyzed, and made available to the public. Any Federal agency having responsibility for collection of such information under any other authority shall cooperate fully in facilitating the collection of such information.

(b) EFFECT ON OTHER LAWS.—No State law or State program in effect on the date of the enactment of this title, or which may become effective thereafter, shall be superseded by any provision of this title, or any rule, regulation, or order thereunder, except insofar as such State law or State program is in conflict with any such provision of section 213 or 221 (or any rule, regulation, or order under this part relating thereto) in any case in which measures have been implemented in that State under the authority of section 213 or 221 (as the case may be).

(c) TERMINATION.—(1) The provisions of parts A, B, D, and E of this title, including any actions taken thereunder, shall cease to have effect on July 1, 1983.

(2) Such expiration shall not affect any action or pending proceeding, administrative or civil, not finally determined on such date, nor any administrative or civil action or proceeding, whether or not pending, based upon any act committed or liability incurred prior to such expiration date.

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