TRENDS IN STATE REGULATORY COMMISSION DEVELOPMENT AND FUNCTIONING

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FOREWORD

This report was prepared by The National Regulatory Research Institute (NRRI) under Contract No. EC-77-C-01-8683 with the U. S. Department of Energy (DOE), Economic Regulatory Administration, Division of Regulatory Assistance. The opinions expressed herein are solely those of the authors and do not reflect the opinions nor the policies of either the NRRI or the DOE.

The NRRI is making this report available to those concerned with state utility regulatory issues since the subject matter presented here is believed to be of timely interest to regulatory agencies and to others concerned with utility regulation.

Douglas N. Jones
Director

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INTRODUCTION

Approach

The field of public utility regulation is larger than any of the academic disciplines associated with the field. The engineering, accounting, public administration, economics, law, political science, and banking disciplines are but a few of those in the field of public utility regulation.

Beyond the academic disciplines, other important sectors of society are also directly involved and affected by public utility regulation. Bankers, stockholders, ratepayers, environmentalists, consumer representatives, state and federal courts, engineers, governors and other elected state officials, the President and other federal elected and appointed officials, as well as utility companies, fuel suppliers and transportation companies, and labor unions are all part of public utility regulation.

It would be beyond the capabilities of any single report to attempt to assess all of the possible trends in the field of public utility regulation. This report on regulatory trends has as its objective, the assessment of trends affecting the entities involved in the state public utility commission regulation of gas and electric utilities in a limited number of issue areas. The issue areas covered include home weatherization, natural gas curtailment, plant siting,

(the prohibition of) automatic fuel adjustment clauses, lifeline rates and rate case processing.

Even this limited objective, however, covers a fairly large area; one capable of examination from a number of perspectives and academic disciplines. The perspective or method of approach chosen in this report is one of breaking the objective down into its constituent parts, each of which is then separately examined. A synthesis of the separate parts is contained in the following section and covers the following:

- Participation in the State Regulatory Process
- Historical Trends in State Regulation
- Concepts in State Regulation
- State Legislative Trends
- Federal Legislative Trends

This approach is particularly useful because it allows the issue of trends in state commission development and functioning to be addressed in an appropriately broad framework.

Participation in the State Regulatory Process

In Part I participation in the state regulatory process is examined. It has often been asserted that participation in the regulatory process has grown considerably in the last several years. In order to examine the participation before state regulatory commissions of intervenors and other parties, information was obtained by the staff of The National Regulatory Research Institute (NRRI) during its visits to state commissions in the fall of 1978.

More than eighty percent of all states report that they are experiencing intervenor participation in their regulatory proceedings, primarily from private organizations (labor unions, business associations etc.), consumer groups, utilities and other private firms.

Some of these intervenors, notably consumer groups have not traditionally participated in the regulatory process.

Legislative activity has also grown significantly, with almost three-fourths of the states reporting that they have passed new laws or amended existing laws regarding regulatory issues since 1975. Legislation expanding commission authority was reported by 79% of the states visited and most often included increases in commission size and the addition of new regulatory functions. State commissions also report having become involved in a broader variety of issues, partly in response to increased external pressure, including fuel adjustment clauses, natural gas curtailment, plant siting and lifeline rates.

Further analysis of the state visit information indicates that the initiation of new programs has become an important activity within the regulatory process in recent years. Rate design appears to have attracted the largest number and greatest variety of participants. Other issues such as lifeline rates and home weatherization have become associated with specific groups. For example, lifeline rates are often viewed as a welfare issue and are associated most often with legislative initiatives. When all new program areas are considered, our data indicates that regulatory commissioners and their staffs along with state legislators, are the most frequently mentioned program initiators.

State commission staff report that the involvement of the federal government as an initiator of new state programs has been limited, except in the areas of rate design and home weatherization. This may change as provisions of the National Energy Act are implemented.

Assessment here about regulatory trends would seem to indicate that while a wide range of participants exists, and seems likely to increase, state regulatory commissions appear (1) to be the most

frequent initiators of new regulatory programs and, (2) to have had an expansion of their resources, duties or authority in the regulatory field.

Historical Trends in State Regulation

Part II of this report examines the evolution of state commission regulation in the United States. The examination focuses upon the significant stages through which state commission regulation has passed and briefly identifies the social, political and technological factors affecting each stage. Several important trends are evident from this examination.

First at any specific point in time, state regulation has as its intent the furthering of certain objectives. Fair prices along with safe and reliable services were until recently the primary objectives of state commission regulation. Energy conservation and environmental protection are two recent legislatively mandated objectives which state commission must now address. It seems reasonable to conclude that (1) the complexity of state commission regulation will increase as additional regulatory objectives are mandated, and (2) regulatory objectives will continue to change in the future.

Second, the use of and need for technical expertise has been an integral component of state commission regulation over time. The modern state and federal commissions evolved out of the inability of their predecessor organizations to provide the technical expertise required for the responsible regulation of gas and electric utilities. Future commission staffing and organizational structures should continue to reflect the need for and use of technical expertise by state regulatory commissions.

Third, the geographical basis for regulation has consistently expanded. Cities, then states, and now federal agencies have found the interjurisdictional growth of gas and electric utilities a difficult

problem to address. Whether this will lead to a non-geographical based, form of regulation is open for speculation. Recently both federal and state agencies have undertaken tentative first steps in addressing interjurisdictional issues affecting regulation.

Fourth, state commission regulation appears to have functioned most often in an adjudicatory and reactive mode, responding to changes in the political and social climate and technological advances, rather than fashioning early responses to these changes. The small size of most state commission research divisions and the virtual lack of formal planning divisions, suggests this trend will continue, at least for the forseeable future.

Fifth, because most state commissions have a reasonably similar structure and authority, changes in the regulatory environment will affect most of them at approximately the same time. This has led to the appearance of apparent cycles and stages in regulatory history. It suggests also "bellwether" and possibly even "lead" commissions may exist. These commissions could be studied to assess, respectively, what the "typical" and "innovative" commissions needs are with respect to their changing environment.

Adaptive response to technological growth and changes in the social and political climate has been the most consistent feature of utility regulation to date. This trend would seem likely to continue with commissions evolving suitable responses to a changing environment.

Concepts in State Regulation

State regulatory commissions, when viewed from an organizational perspective, have features which have been extensively examined by public administrators. These features, such as the concept of a "life cycle," may have important consequences for both the regulatory process as well as for the type of regulatory outcome. Examination

of these features may provide a useful framework against which trends in state commission operation may be either projected or measured.

In Part III of this report several theories concerning the evolution of public utilities are examined.

A sampling of propositions derived from public administration literature and contained in Part III of this report is listed below. Each is based upon observations of organizational behavior in other situations and is useful in assessing trends in state commission development and functioning. Organizational theorists propositions found in Part III include the following:

1. In order to avoid charges of unfairness that may be substantiated during judicial review, a regulatory commission will allow private parties easy challenge to its actions and will spend most of its time in adjudication.

2. Over time, professionalism will grow and this will encourage an emphasis upon precedent. As a result, a commission will develop a large backlog of cases.

3. Organizations will seek to expand because an organization that is rapidly expanding can
   A. attract better personnel and more easily keep the best personnel;
   B. reward leadership personnel with increased power, income and prestige;
   C. reduce internal conflicts over scarce resources; and
   D. improve the quality of its performance.

4. All organizations tend to become more conservative as they get older, unless they experience periods of very active growth or internal turnover.

5. In order to ensure survival, new organizations will seek additional functions and seek to extend the number of clients.

Focusing upon proposition number five, for example, it would be possible to expect and predict that recently established state energy offices may seek to increase the number of their assigned activities and that one area of expansion might be in some aspect of public

utility regulation. Given the growing number of state energy offices, consumers counsels and even the expansion of duties assigned many state commissions, these propositions may provide a useful basis for predicting and explaining future behavior and regulatory outcomes.

Part III concludes with an analytical framework designed to assist regulators in anticipating change and to assess the impact of alternate regulatory instruments. The overall framework presented consists of a set of typological frameworks linked by the logic of systems analysis. This approach generally includes the following: an identification of the problem area, specification of the objective function, and consideration of alternative strategies. Final decisions are made by evaluating the impacts of alternative strategies on the basis of explicitly stated choice criteria. This systematic approach to regulatory analysis and design is facilitative and suggestive, although not in itself able to define the best course of action. There are limitations to this approach for policy-making, but, it can be useful for identifying, classifying and tracing trends in regulation.

State Legislative Trends

In Part IV, the participation of state legislatures in the state regulatory process is examined through a survey of recently passed state legislation. State legislatures play a unique role in state commission regulation in that they establish the duties and authority of commissions through enacted legislation. An assessment of trends in state commission development and functioning is incomplete without an examination of the trends revealed by recent state legislation.

It should be noted, however, that the lack of a newly enacted law does not imply a lack of interest in a given topic by a state commission or the legislature. Whereas one state legislature might enact a very detailed fuel adjustment clause bill, another state might not because it is felt that the basic enabling legislation for the commission provided sufficient rulemaking authority.

In addition to describing the specific bills enacted, the legislation is also classified according to geographical region, state population and the state's net energy production status. Legislation examined covered a fairly broad area, and includes such topics as energy conservation, energy management, organizational design and resource utilization. Analysis of laws enacted in each of these areas permits us to examine the duties and authority assigned to all state energy agencies by legislatures.

Some of the results reported in Part IV indicate:

1. A quantum jump in enacted energy legislation from 30 laws in 1973 to 379 in 1977.

2. The Western states appear to be the most active in the passage of energy legislation; followed by the Mid-west and Mid-Atlantic states.

3. The New England states, although they exhibited less overall legislative activity, ranked high in rate design, solar tax relief, establishment of consumers counsels, power pooling and demand forecasting.

4. The legislative enactments of Alaska were similar in emphasis to the other net energy exporting states, while legislation passed in Hawaii (a net energy importing state) closely resembled that passed by the New England states.

5. Net energy exporting states averaged 16.5 pieces of enacted legislation, while net energy importers averaged 18.1 laws.

6. Clear legislative patterns are not apparent when states are classified according to population, with the possible exception of the large number of rate design laws passed by the more populous states.

7. State legislatures have acted to increase the duties of state regulatory commissions as well as state energy offices, consumer counsels and governors offices.

Two broad conclusions can be drawn from the information provided in Part IV. First, state legislatures appear to enact bills to complement their comparative advantage or comparative "disadvantage." Net

energy exporting states pass more resource development bills: plant siting, gas and oil, and solar energy. Net energy importing states, on the other hand, passed more energy conservation, energy management, and organizational development legislation.

Second, legislatures have acted to create a fairly large number of state energy offices and advisory bodies, and to increase the power of the governor to act in an energy emergency.

Federal Legislative Trends

Both federal and state commissions regulate public utilities, and both have recently experienced changes in duties and authority. Issues once thought to be the domain of either state or federal agencies have now become important to both. In Part V, legislative and legal trends affecting the scope, nature and substance of federal and, to a lesser extent, state regulation of electric and gas utilities are described and examined.

State regulatory commissions predate federal regulatory commissions and served as a model for the federal commissions. Viewed from a limited perspective federal and state commissions have somewhat distinct and different duties, and yet the trend in recent federal legislation appears to call for some form of federal state partnership. Impetus for this partnership stems in part from a recognition that (1) state regulatory commissions under state law have a significant impact on national policy, and (2) federal interstate regulation has a substantial impact upon state commission policy.

Prior to 1973, state and federal regulatory commissions did not appear to devote much attention to the relationship between rate structure and energy consumption. The post-oil embargo realization that energy consumption and energy conservation were important regulatory objectives was most responsible for the increased attention paid to

the affect of rate structure upon energy consumption. The National Energy Act explicitly recognizes this linkage and mandates certain types of rate structure reviews be performed by state regulatory commissions.

One purpose of this report is to examine the historical development of federal legislation before the passage of the NEA and its implication for federal/state relations. In addition, three major provisions of the NEA itself will be discussed in detail, focusing on the impact of these provisions and their implications for intergovernmental relations.

At this stage the partnership appears to be one of mutual deference, where state regulatory agencies consider regulatory issues having potential national impact in the context of their applicable state laws, administrative rulings and court decisions. The National Energy Act speaks more to the processes and standards to be considered than to stipulated regulatory outcomes to be achieved by this partnership. Achievement of national energy goals, with some important exceptions, is dependent upon the separate activities of 51 commissions.

It is too early to predict the future course of federal and state regulatory policy, other than to observe that it will undergo modifications and incremental adjustments. State commissions must respond to specific regulatory issues on an evidentiary basis and may allow important exemptions in areas where federal policy makers would value consistency or adherence to specific standards. Herein lies the crux of the matter. To the extent that reasonable federal/state congruence evolves on specific regulatory issues, the present framework of state regulation and intergovernmental relationships, many of which are described in the National Energy Act, will continue. If, however, significant federal/state disagreement arises over substantive and regulatory process issues, it would not be unreasonable to expect new federal legislation designed to resolve these differences in favor of the federal stance.

Conclusion

Perhaps the most fundamental conclusion that can be drawn from our assessment of regulatory trends is one regarding the nature of the changes observed. The regulatory trends observed unmistakably point to the fact that the arena of regulation is expanding. State regulatory commissions have not had their duties and authority eroded in the favor of newly created agencies. Rather it seems that the regulatory arena has expanded and that it is difficult to assess with any precision the exact strengths of the numerous federal, state and non-governmental agencies involved.

Regulatory textbooks have, until quite recently, described (1) fairly clear roles and duties for federal and state regulatory agencies, (2) a well circumscribed set of regulatory issues - usually rate making and reliability of service, (3) the evidentiary or quasi-judicial basis of regulation, and (4) a small number of parties who formally appear before a commission in a hearing. All four of these have changed considerably.

State and federal regulatory agencies interact with increasing regularity, sometimes in partnership and sometimes as adversaries. Regulatory issues once considered routinely have greatly expanded with the most important being the relationship between cost-of-service, and rate structure; energy consumption and energy conservation. While the evidentiary hearing is still the primary vehicle for regulation, recent state and federal legislation have delineated standards and issues that must be considered in the course of a hearing. State regulatory commissions have acted along with state and federal legislatures to permit and encourage formal intervention or participation of consumers, consumer groups, state energy offices, state attorneys general, and federal agencies in regulatory hearings.

Our assessment of regulatory trends has been undertaken largely from an organizational or administrative perspective. Using this

perspective our assessment indicates a continued growth of duties, authority and funding for state regulatory agencies. Likewise, the federal, state and non-governmental agencies appear also likely to experience continued growth regardless of which political party is in power and in spite of the widespread criticism of governmental intervention in general and the regulatory role in particular.

PART I

PARTICIPATION IN THE STATE REGULATORY PROCESS[1]

[1]Prepared by Mary Stupnik, Research Associate, The National Regulatory Research Institute.

Part I: Table of Contents

INTRODUCTION

In recent years a variety of organizational entities have appeared to emerge as important factors in the field of state utility regulation. State energy offices, power siting commissions, attorneys general, and consumer advocate groups now appear with frequency before state regulatory commissions. State legislatures also have become more involved in the regulatory process through enacted legislation.

Historically, it has appeared that the primary participants in the regulatory process have been the state commissions and the regulated utilities. The introduction of state legislative bodies, intervenors and federal agencies into the process has had and will continue to have an important impact on state regulation. Assessment of the impact of these relatively recent participants is, however, difficult as little systematic evidence exists to document the extent and impact of their participation in the regulatory process.

The purpose of this report is to identify how pervasive the activity of these new entities has been throughout the states and the District of Columbia and to determine what specific areas of regulatory activity are receiving the greatest attention.

The primary source of data regarding participation in the regulatory process is from information obtained by the staff of The National Regulatory Research Institute during their visits to state regulatory

commissions in Fall 1978. State commission staff were asked to provide lists of intervenors appearing before the commission in recent rate cases. Also, staff were asked about the involvement of other participants in topics such as home weatherization, natural gas curtailment, plant siting, fuel adjustment clauses, lifeline rates and rate case processing. The intent here was to determine not only who the participants were, but also the actual extent and impact of their activity. Finally, information was also obtained regarding recent legislation affecting the structure or duties of the commission and administrative or court decisions affecting the commission.

Unfortunately the information gathered does not permit an exhaustive assessment of the impact of these groups upon the regulatory process. It does, nonetheless, permit an accurate description of the activities and attention paid to important regulatory issues by these groups.

Participation in the regulatory process can occur in a number of ways. Three methods of participation are examined here. They include participation as an intervenor; participation through legislative action; and participation through the initiation of new commission programs. Following a brief examination of participation in each of these issues, the overall participation by the different types of participants is examined and conclusions drawn.

PARTICIPATION

The role of intervenors is of concern because the introduction of new entities into the regulatory process often changes the scope of discussion and can require the consideration of a broader range of issues before a final decision can be reached. The impact of new legislation is also significant because it often changes the role played by the commission in the regulatory process. If new areas of responsibility are assigned or existing responsibilities modified, this has an impact on the entire regulatory process and may, in some cases, change its overall direction. Additionally, court rulings and administrative

interpretation, although often not as widely publicized as legislation, may have an impact on the daily operations of a commission as well as on its response to specific issues. Finally, the process of regulation can be influenced by initiation of new programs, such as weatherization or management audits.

Intervenors

Forty-two of the 50 states and the District of Columbia provided NRRI staff with information concerning intervenors in decided rate cases. Thirty-four of these forty-two states (81%) indicated that intervenors have participated in the rate setting process in their states. The remaining eight states visited did not provide any information concerning intervenor participation, which does not necessarily imply the absence or presence of intervenors.

The states were also asked to identify the specific intervenors involved in decided rate cases: nine classifications were developed to identify individuals appearing on their own behalf as well as those representing a variety of interests ranging from industrial groups to consumer groups and federal agencies. The classes of intervenors mentioned most often by the states as appearing in decided rate cases are residential and industrial consumer groups, private organizations[1] and private firms (both utilities and others). Occurring with less frequency have been individuals and units of state and local government. Intervenors mentioned least often were attorneys general's offices and federal agencies. Table 1 summarizes the number of and proportion of states reporting intervenor involvement from various sources.

From these data it can be concluded that most states are experiencing intervenor participation from nontraditional intervenors as well as from traditional sources, particularly private organizations and

[1]Private organizations include labor unions and organizations such as merchants associations.

Table 1: Intervenor Participation in Decided Rate Cases

	Intervenor Participation		Classification of Intervenors								
	Yes	N/A[a]	U	OPF	C	AG	CG	PO	S&LG	I	FA
Number of States (b)	34	8	22	21	13	9	22	26	18	13	7
Proportion of Responding States	81%	19%	52%	50%	31%	21%	52%	62%	43%	31%	17%

n=42 state commissions

[a] Eight states did not provide information concerning intervenor participation.

[b] Information obtained from 42 states.

Key:

U = Utilities
OPF = Other Private Firms
C = Commission Staff
AG = Attorney General
CG = Consumer Group
PO = Private Organization
S&LG = State & Local Government
I = Individual
FA = Federal Agency

Source: NRRI Fall 1978 State Visits

residential consumer groups. Whether this represents an emerging trend over time for all states or a particular state is not determinable from these data; however, many state commissions did comment on the relative newness of this development. What is apparent, is the wide range of organizations actively participating as intervenors.

Legislation and Administrative Rulings

Commission structure and function can be changed through the passage of a bill by a legislative body or through administrative interpretations and court rulings. The responding states indicated that a significant amount of both types of activity has gone on since 1975.

Over three-fourths of those states providing NRRI staff with information reported legislation or significantly amended laws governing the functions of their utility commissions. The content of the new legislation was very diverse, but it can generally be classified according to whether it expands commission authority, reassigns commission duties to other agencies, states legislative policy intentions or has a neutral or as yet unknown impact on the commission.

Table 2 shows the number of states which have passed this kind of legislation, and the perceived impact of this legislation on commission authority.

Legislation expanding commission authority was reported by 79% of the states and most often included increases in commission size and the addition of more comprehensive regulatory functions. Legislation reassigning duties usually involved the creation of a new agency, often energy or transportation oriented, which would take over some of the duties previously handled by the public service commission.

Legislative policy statements often do not have a direct impact on the definition or scope of commission authority, however they do limit a commission's discretionary authority. Policy statements include

Table 2: Legislation Since 1975

	Legislation Passed[a]		Impact of Legislation on Commission Authority[b]			
	Yes	No	Expand Duties	Reassign Duties	Policy Statements	Neutral
Number of States	32	10	19	5	9	5
Proportion of States[c]	76%	24%	79%	21%	36%	21%

(a) States and District of Columbia

(b) Of the 32 states having passed legislation, 24 provided documentation concerning content. Some states passed legislation falling into more than one of the impact categories.

(c) Based on information obtained in 42 states.

Source: NRRI Fall 1978 State Visits

legislation limiting the time commissions have to process rate cases, limiting the conditions under which utilities may discontinue gas and electric supplies to consumers, or changing the conditions under which rate increases may take effect. Policy statements in the regulatory field appear to be increasing in importance. While only 36% of the states reported legislative policy statements, those that did often passed several pieces of this type of legislation since 1975. This does not include those states which might have considered this type of legislation, but did not pass it, or those which included policy provisions in other types of legislation.

Neutral legislation consists of laws passed concerning regulatory commissions, but which did not have a direct impact on their authority or structure. Examples of this include allowing the creation of municipally-owned and operated electric utilities which do not fall under the commission, and laws requiring commission staff to divest themselves of utility company stock holdings.

It appears that state legislatures are active participants in the regulatory process and are having an impact on the scope of authority as well as policy orientation of state commissions. Incomplete data and the short time period covered by our study make it difficult to determine whether this represents a long-run trend toward increasing involvement by legislatures in the regulatory process.

Only twelve states of the forty-two responding indicated that significant changes in the role of their utility commission have come about due to administrative rulings or court decision. All of these states also indicated that significant legislation regarding the issues involved had been passed in the same time period. This implies that administrative rulemaking and legislative activity may be supplemental activities that serve as rough indicators of the level of attention paid to a regulatory issue in a state.

Table 3 summarizes the number of states reporting administrative rulemaking activities and court decisions since 1975.

Table 3: Administrative Rulemaking and Court Rulings Since 1975

	Administrative Rulemaking		Court Decisions
	Yes	No	DK/NA
Number of States[a]	12	25	5
Proportion of States	29%	60%	11%

(a) Based on information obtained in 42 states.

Source: NRRI Fall 1978 State Visits

Program Initiation

A variety of issues of interest to state regulatory commissions have arisen in recent years. Frequently noted issues include: home weatherization, natural gas curtailment, plant siting, fuel adjustment clauses, lifeline rates and rate case processing time limitations.

The state commission staffs were asked to identify in which of the areas listed above they have initiated new activities in the last five years. Of the six areas, fuel adjustment clauses received the largest share of states' attention. Lifeline rates, natural gas curtailment and plant siting were also frequently addressed issues. Home weatherization was addressed by slightly less than half the states, while only about one-third of the states reported activity concerning rate case processing time limits. Table 4 summarizes these results.

Table 4: Fields of Commission Interest

	HW	NGC	PS	FAC	LR	RCPTL
Number of States[a]	18	25	25	30	26	15
Proportion of States	43%	60%	60%	71%	62%	36%

(a) Based on information obtained in 42 states.

HW = Home Weatherization
NGC = Natural Gas Curtailment
PS = Plant Siting
FAC = Fuel Adjustment Clause
LR = Lifeline Rates
RCPTL = Rate Case Processing Time Limit

Source: NRRI Fall 1978 Visits

A Note on Rate Design

Rate design has been one of the major activities undertaken by regulatory commissions over time, although even this function is now being undertaken in a different climate. It is widely reported that the role of intervenors in this area has grown rapidly. Rate design often appears to attract more attention than any of the other issues facing state commissions. Commissions, commission staffs, consumer groups and consumer advocates are the most frequent participants in rate design. Attorneys general and legislatures are also frequently mentioned participants. (See Table 5.)

The degree of federal involvement in rate design recently has been substantial. The Department of Energy (DOE) has been particularly active, appearing as an intervenor before 13 commissions of the 42 commissions providing NRRI with information in the area of rate design. Other agencies, particularly the General Services Administration (GSA), served as intervenors in six other states. Private energy-producer organizations such as the East Central Area Reliability Council (ECARC), have also played active roles as intervenors in rate design proceedings.

The major forms of DOE involvement reported are funding, participation in generic hearings, data collection and rate case participation. On-site visits and trips to Washington are less frequently used forms of federal involvement. GSA seems to be the most active participant in state commission rate design proceedings besides the Department of Energy.

Plant Siting

Plant siting concerns decisions about the location of new power plants within a state. Of the 42 states responding, 25 commissions indicated they have dealt with this issue recently, 15 indicated they have not, and two anticipated that it would arise in the near future. This area does not seem to involve as broad a range of participants as

rate design, although the nucleus is the same: commissioners, commission staffs, the legislature, attorneys general and consumer groups. Utility companies are understandably heavily involved in several states.

The participation of legislatures and attorneys general is greatest in cases involving nuclear power plant siting. This may be a response to lobbying efforts in that regard.

Federal agencies do not appear to be heavily involved in plant siting decisions. DOE was reported to have assisted two states and the Environmental Protection Agency (EPA) and Nuclear Regulatory Commissions (NRC) were reportedly involved in three states.

Rate Case Processing Time Limits

Fifteen states of the 42 responding have recently established time limits for rate case processing. Legislatures were primarily involved in initiating these programs and the only other reported participants are commissioners and commission staffs.

Lifeline Rates

Twenty-six states of the 42 responding have considered the adoption of lifeline rates, although only eight have succeeded in doing so and another five are either involved in experimental programs or awaiting final decisions. The major participant and initiator of lifeline rates reported has been the legislature. Other participants in the program have been commissioners, commission staffs and governors' offices. Consumer groups have generally shown little interest in this area from the commissions' perspective, although this could mean that they are directing their activities toward the legislatures, rather than the utility commissions.

The only federal involvement ascertained from the commissions in the establishment of lifeline rates has been where federal funding was obtained to study cost-based rates in connection with a specific rate case.

Fuel Adjustment Clauses

Thirty states indicated they have considered fuel adjustment clauses. Legislatures, commission staffs and commissions have been the primary participants in the establishment of fuel adjustment clauses. Consumer groups and consumer advocates have reportedly been involved in very few of these state programs.

Federal participation in this area has also been limited. DOE has not been involved in any states' programs, although FERC has assisted two states.

Natural Gas Curtailment

Half of the states contacted have established a natural gas curtailment program. Chief participants in these programs have been the commissioners and commission staffs. State energy offices have been more active here than in other areas. Not all the states which have actively considered natural gas curtailment plans have adopted them.

DOE involvement in this area has been limited to assisting one state through data collection, mail and phone contact and Washington visits. FERC has been involved with nine states in the form of case processing generic hearings and practice guidance.

Home Weatherization

Eighteen states have instituted home weatherization programs with two other states planning to begin programs in the near future. Commissioners, commission staffs and utilities have been the main

participants in the establishment of weatherization programs and utilities appear to be more involved in this program than any of the others which were investigated.

DOE's involvement in this program has been significant in four states through funding, data collection, phone or mail contact, as well as through on-site and Washington visits. In one state, a federal agency has assisted in determining eligibility of residents for interest-free loans.

PROGRAM INITIATOR CLASSIFICATION

As indicated previously, a number of different organizations have been involved in initiating programs concerning various regulatory issues. Of course, they have not all been involved in each of the programs to the same extent. This section describes the frequency of initiation activity on the part of several organizations, both at the state and federal levels as reported by state commission staff.

State Involvement

A large number of organizations ranging from the governor and legislature to consumer groups and state energy offices, may participate in regulatory proceedings along with commissions and their staffs. The number and type of participants may vary depending upon the issue under consideration.

Table 5 shows the ranking of all major participants as program initiators by issue. This table is based on information gathered from each state concerning the participants in its own regulatory process. These data were then aggregated to identify any apparent national trends.

The group most often cited as initiators of regulatory programs are commission staffs and commissioners. These two participants never ranked below third in any of the areas considered. This could be

Table 5: Ranking of Initiators Within Issue Area

Initiator[a]	Issue Areas: Rate Design	Plant Siting	Rate Case Processing	Lifeline Rates	Fuel Adjustment Clause	Natural Gas Curtailment	Home Weather-ization	Average Score	Average Rank
Governor	11	9	5	4	6.5	8.5	4	6.9	6.5
Legislature	8	4	1	1.5	1	6	5.5	3.9	3
Commissioners	2	1.5	2	1.5	3	2	2	2	2
Commission Staff	1	1.5	3	3	2	1	1	1.8	1
Attorney General	7	4	5	8	8.5	8.5	8.5	6.9	6.5
Consumer Advocate	3.5	10	7.5	8	4.5	6	7	6.6	4.5
Consumer Group	3.5	4	7.5	6	6.5	10	8.5	6.6	4.5
State Energy Office	9.5	7.5	10	8	10.5	4	5.5	7.9	8
Federal Agency	9.5	11	10	10	10.5	11	8.5	10.7	10
Other	5.5	7.5	10	11	8.5	6	8.5	8.1	9
DK	5.5	6	5	5	4.5	3	3		

(a) Based on information obtained in 42 states.

Source: NRRI Fall 1978 State Visits

explained by the fact that since they are in closest contact with these matters on a daily basis, many new ideas will be generated through their efforts. It is equally likely, however, that since they are so close to the process, they may tend to overstate their roles in initiating new programs. The involvement of the commission and its staff will most likely be required in all issues at some point, and it is often difficult for staff members to recall whether they, or an outside organization initiated the activity.

State legislatures were cited as the third most active participant in the regulatory process. State legislatures were especially active in the areas of rate case processing, lifeline rates and fuel adjustment clauses. State consumer advocates and consumer groups were reported as the next most active groups.

Although the results could seem to indicate a low rate of participation on the part of several groups often associated with the regulatory issues discussed above, this is not necessarily the case. The purpose of these data is to show who the initiators of these programs were. This does not imply that other actors were insignificant in the development, establishment or implementation of the resulting programs. For example, consumer groups are often involved in many of the policy areas discussed here, but may not have adequate resources to consistently initiate action. Their activities can be reactive, rather than proactive. In other cases, for example, the governor's suggestions and policy positions may be communicated informally to those who have ongoing responsibilities in the regulatory field. As a result, commissioners and commission staffs may be reacting to outside stimuli, but still consider themselves to be program initiators because they placed an issue on the formal agenda.

Federal Involvement

Federal involvement in state regulatory issues has been low in the specific topics examined here, with the exception of rate design and home weatherization. The Department of Energy has provided assistance

to states in the areas of rate design and home weatherization. State commissions reported that this has been done primarily through funding support, data collection and on-site visits. DOE's involvement in generic hearings concerning rate design has been reported as significant.

The involvement of other federal agencies has been concentrated on natural gas curtailment and rate design. The major agency participating in regulatory activities at the state level was the GSA.

CONCLUSIONS

Participation in the regulatory process has appeared to grow significantly in the last several years. Legislatures, intervenors and federal agencies have taken more active roles in regulation than they had previously held.

More than 80 percent of all the states report intervenor participation in regulation, while the others provided no information concerning intervention. The most active categories of intervenors appear to be private organizations (labor unions, business associations, etc.), consumer groups, utilities and other private firms.

There has also been a significant increase in legislative activity evidenced by the fact that almost three-fourths of the states responding have passed legislation or amended existing laws regarding regulatory issues since 1975. Seventy-nine percent of these states have expanded commission duties, while 36 percent have passed policy-oriented legislation. Legislation in the area of policy statements is becoming increasingly important and often limits the discretionary authority of commissions. It appears that while commissions are being given increasing statutory authority in new areas, their discretionary authority is being more carefully delineated to ensure that legislative intentions are carried out.

Of the regulatory areas considered in this study, fuel adjustment clauses, natural gas curtailment, plant siting and lifeline rates have

received the greatest amount of commission attention. Lagging behind in the number of commissions which have addressed the issue are home weatherization and rate case processing time limits.

Program initiation has also become an important activity within the regulatory process in recent years. Newly recognized issues and new aspects of existing issues have drawn attention and led to the initiation of new programs designed to address these issues. The areas which have attracted the largest number and greatest variety of actors in the initiation process is rate design. Many of the other issues, such as fuel adjustment clauses, natural gas curtailment and power plant siting, have attracted a smaller range of new programs. Other issues, such as lifeline rates and home weatherization, have come to be associated with a specific group. For example, lifeline rates are often associated with welfare issues with state legislatures playing a key role in its initiation. Similarly, utility companies have often taken a lead in home weatherization programs.

The most active program initiators appear to be the commissioners and commission staffs, followed by state legislatures. Other programs may participate extensively in the process, but do not initiate action for a variety of reasons. First, many potential program initiators make their interests known to commissioners and/or their staffs informally, allowing them to undertake the formalization of the process because of their statutory role. Commissioners and their staffs may also be able to anticipate the actions of other agencies before they occur due to information communication networks and issue sensitivity, which allows them to take whatever initiatives are required first. Finally, many of the issues addressed here are technical in nature, and other prospective initiators may not have the financial or expert resources to initiate activity, although they may later become involved.

Federal involvement in state program initiation has been limited, particularly outside of the areas of rate design and home weatherization. In cases where federal agencies did make a contribution to

program initiation, it frequently occurred in the area of funding. Information obtained concerning possible federal involvement was obtained prior to any increase in federal involvement anticipated under the National Energy Act.

In sum, the majority of states report intervenors participating in decided rate cases, with a nontraditional intervenor--consumer groups--reported as the second most active type of intervenors. Three-fourths of the state commissions reported recent legislation expanding state commission authority, although this was sometimes accompanied by legislation prescribing commission policies in a given issue area. Last, commissioners, commission staffs and state legislatures were reported as the three most active regulatory program initiators.

Participation of "outside" entities in the state regulatory process appears to be quite extensive. It is apparent, however, that state commissions are reportedly the most active initiators of new programs and that most commissions report that recent legislation has expanded their duties as well as their authority.

PART II

HISTORICAL TRENDS IN STATE REGULATION[1]

[1] Prepared by Mary Stupnik, Research Associate, The National Regulatory Research Institute.

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INTRODUCTION

Present day state commission regulation is the result of a complex interaction of legal, economic and administrative factors, which have evolved in the United States over the past 100 years. The range of industries being regulated, the extent of this regulation and the methods by which it is accomplished have changed over time. The process has proven to be dynamic, adjusting to changes in technology, new forms of business organization, political development and changing social goals.

In a time when the regulatory arena is the focus of public attention and change is occurring rapidly, a look at the history of the regulatory process in the United States is useful. It can provide a perspective on the evolution of this process, identify trends, and possibly indicate in what direction(s) it will take in the future. The history outlined below is not detailed nor definitive. Instead, it seeks to highlight the dynamics of regulation and the changes that have occurred in the structure and form of state commission regulation.

EARLY ATTITUDES TOWARD REGULATION IN THE UNITED STATES

In the colonial United States, controls similar to those practiced in England prevailed, i.e., the notion of "common calling" demanded one charge a reasonable price and provide the good or service to all. After

the War of 1812, many of the legal restrictions were repealed. Government regulation was opposed. The thrust, instead, was toward competition as the best form of control. The only public industries requiring franchises at this time were carriers, toll roads, and waterways.

The industrial revolution had a major impact on attitudes toward regulation. The United States economy shifted from an agricultural to an industrial basis and as it did so the importance of public provision of goods and services increased. The post Civil War growth of corporations and development of interstate commerce changed the prevailing forms of economic organization and served to change American attitudes toward the effectiveness of competition as a regulatory force.

EARLY METHODS OF PUBLIC UTILITIES REGULATION

The commission method of utility regulation represented an important departure from previous efforts at regulation. Prior to the institution of state commissions, regulation was carried out by a variety of other means including: judicial, legislative and contract or franchise. Each of these methods was eventually found to be inadequate to the task of providing ongoing supervision of industries operating in the public interest.

Regulation by judicial decision relied upon the initiative of injured parties to bring an issue before the courts because it violated common law rights to adequate service at reasonable prices. This method quickly proved to be ineffective for several reasons. These reasons include: expense and delay involved in the proceedings; lack of continuity; inability to take preventive measures against potential abuse; and lack of expertise on the part of judges, particularly regarding specific industry problems.

Legislation was the next method tested as a regulatory tool. Many of the first public utilities were incorporated by legislative acts, which specified the rights and obligations of the firm, special

privileges such as easements and tax exemptions, and in some cases, the maximum rates which could be charged for a service. These corporate charters eventually were generalized by the legislature to such an extent that the public utilities merely filed an application for a charter and were subject to only the most general regulations if the charter was granted. This form of regulation was found to be inadequate because charter provisions were often either too general to be applied in specific situations or too rigid to allow for effective regulation as industries grew. Furthermore, legislators often lacked the necessary expertise to write charter provisions that would ensure their intent would be carried out, and violations could only be handled through the judicial system, at best an expensive and time-consuming process. There was no effort made through legislation to control entry into the various industries because competition was still viewed as the primary regulating force in the economy.

The failure of both judicial and legislative regulation led to the development of local government regulation of public utilities through franchises. A franchise is a grant of special privileges by a city to a public utility based upon authority derived from the state. The franchise typically includes provisions giving the utility the right to occupy city streets with its equipment and to supply certain services as a monopoly. The authority to operate as a monopoly is one of the most significant developments arising from the franchise approach to regulation.

The franchise method of regulation was the most widely used approach to this problem between the Civil War and World War I, although it also experienced significant problems. The major problems with franchise regulation were that one could not regulate a dynamic industry through a legal instrument whose terms were often fixed for more than 50 or 100 years at a time when the entire U.S. economy was growing very rapidly. Another disadvantage was the limited jurisdiction of local government, whose authority did not extend past its political boundaries, although

public utilities' service areas rapidly expanded beyond them. Finally, most cities, particularly smaller towns, did not have the experts or the time to keep abreast of utility industry developments, either technological or organizational.

THE DEVELOPMENT AND GROWTH OF STATE COMMISSIONS

The first state commissions, established between 1808 and 1869, were much less powerful than their present-day successors. Only seven states established commissions at this time. The seven include the six New England states: Rhode Island (1839), New Hampshire (1844), Connecticut (1853), Vermont (1855), Maine (1858), and Massachusetts (1808); and one state in the Northwest Territory, Ohio (1867). These commissions had no rate setting authority, little power, and dealt mainly with railroad issues such as safety, eminent domain and property appraisal.

The development of state commissions was given impetus by the Granger movement of the 1870's. The political power of the Granger movement was felt in legislatures throughout the Midwest and commissions were created to either enforce a legislatively mandated ceiling for railroad rates or to determine those ceilings by their own authority. In 1876, the authority of the states to pass laws regarding prices to be charged by a private enterprise affected with the public interest, was challenged in the landmark case of Munn v. Illinois. The Supreme Court, in ruling on the case, cited English common law as a basis for permitting states to regulate those activities generally deemed to be affected with the public interest. The commissions established during this movement were short lived with most of them giving way to commissions having more of an advisory role and much less authority.

The first modern day state commissions were established in New York and Wisconsin in 1907. By this time the number of private enterprises "affected with the public interest" had grown very large due to

technological developments and overall economic growth. Reform-minded governors in these two states recognized the need for continuous regulation based on expert authority having a statewide jurisdiction. The Wisconsin structure, became a model for many of the commissions established later. Rate regulation, as well as authority over safety, uniform accounting practices, examinations, audits, and property valuation were all part of the newly formed commissions' activities. The decade between 1910 and 1920 showed the greatest amount of commission formation activity, with almost half of all existing state commissions being established during that decade. The other period in which a significant amount of commission formation took place were the years 1930 to 1939, when ten commissions were formed.

THE NATURE AND EXTENT OF STATE COMMISSION ACTIVITY

There is some variation in the amount of authority given to state commissions across the country, as well as in the scope of their activities. Recently, commissions have become more active initiators of energy-related programs and the scope of their activities has grown beyond its traditional definition.

The amount of activity undertaken by commissions at any time since the 1870's has varied, largely depending on the political climate of the period, the amount of technological development in the utilities field and existing economic conditions.

Each year, all state commissions are asked to submit an historical account of significant events since their founding to the National Association of Regulatory Utility Commissioners (NARUC) for publication. All data are submitted to NARUC by the appropriate state commissions as a self-assessment of significant historical events. Since neither the form or substance of this information is specifically requested by NARUC, only what the agency believes to be important in its formation (be it date of creation, passage of a specific act, etc.) is included.

In order to establish some sort of indicator of periods of high commission activity, the statements of all the commissions were inventoried for dates that the individual agencies thought were significant, and therefore specifically mentioned in the 1977 NARUC Annual Report. This information was then aggregated on a decennial basis to determine which decades, since 1870 have shown the highest amount of commission activity as perceived by the commissions themselves.

Figure 1 is a graphic presentation of the commissions' responses, and shows that there is some variation in the commissions' level of activities over time. Regulatory activity appears to have grown steadily between 1870 and 1909. In the decade between 1910 and 1919, activity increased significantly, which is to be expected since this is when most state commissions were established. Activity fell off somewhat in the 1920's and increased only slightly in the 1930's. During the 1940's commissions were less active than they had been since the 1890's. There was somewhat more activity in the 1950's and 1960's, but it was not until the 1970's that regulatory activity reached the level experienced in the 1910's.

Presently available information concerning the 1970's only includes the period up to 1976. In order to extrapolate to the end of the decade, the average percentage growth rate for all the decades was used to forecast the 1976 through 1979 activity.

From this information it appears that commission activity is somewhat cyclical in nature. Peak activity periods are often followed by periods of much less activity. The two decades in which most regulatory activity has taken place have been the 1910's and the 1970's (assuming trends occurring in the first part of the 1970's continue). Secondary activity peaks appear to have occurred in the 1930's and 1960's.

The activity occurring in the 1910's included the formation of regulatory commissions and the passage of acts defining their functions

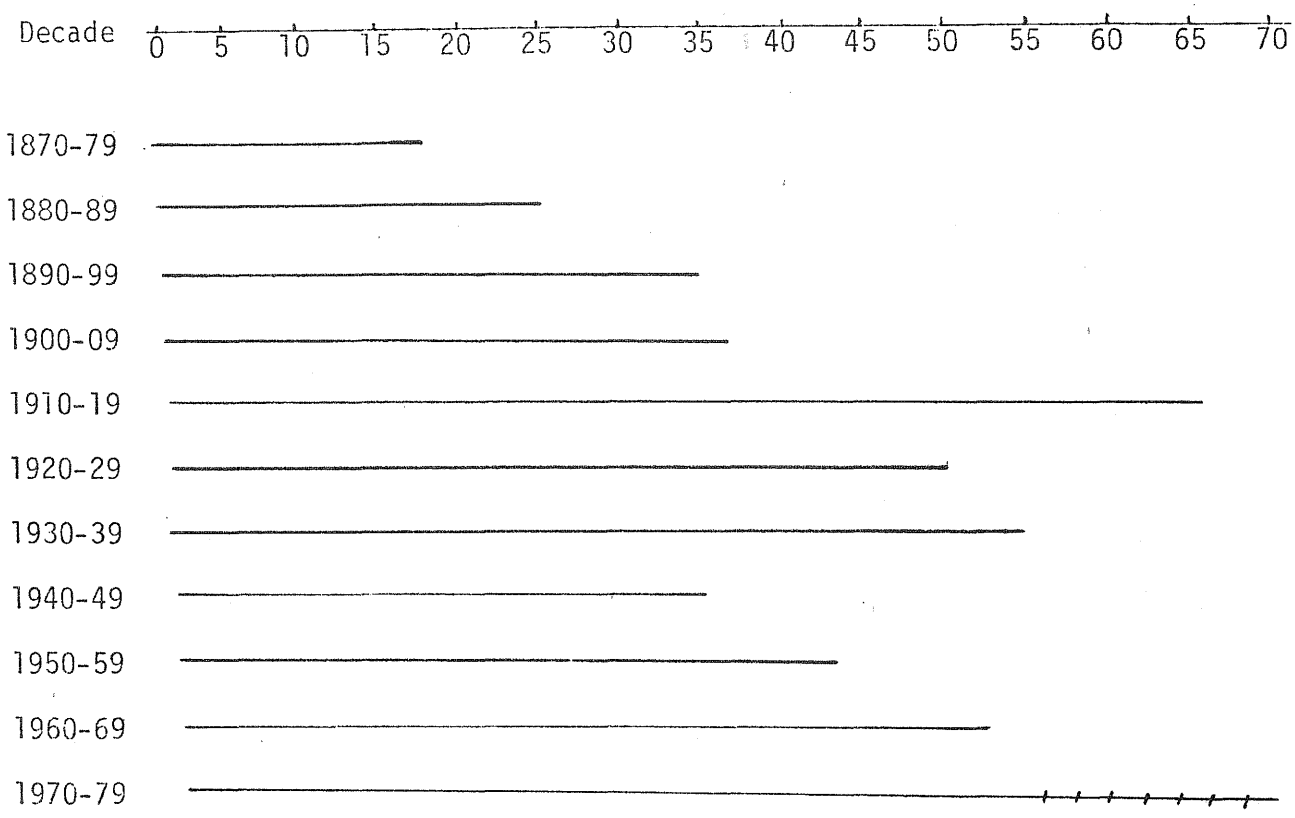

Figure 1: Commission Perceptions of Regulatory Activity

and scope of authority. This period corresponds directly with the onset of widespread use of electric lighting and gas heating in homes. Technological change and economic growth forced the public sector to establish a mechanism that could better respond to existing regulatory needs. The growth in activity being experienced in the 1970's is motivated by somewhat the same causes. Public utilities have been experiencing significant changes, particularly in the availability of raw materials (e.g., oil and natural gas shortages), changes in technology (e.g., nuclear power development as well as exhaustion of

production economies of scale) and accountability to the public. Legislatures, governors and the regulatory agencies themselves are responding to these changes by expanding the scope of their activities to meet these new demands on the regulatory process. To this extent, the regulatory activity of the 1970's is very different from the 1910's, when establishment of the commissions themselves was most important.

The 1930's were also a period of some significance in regulatory activity because this was generally a period of extensive government intervention in the economy. A specific development in the public utilities sector was the introduction of the Rural Electrification Administration in areas of the U.S. where it was not yet economically feasible for the private sector to undertake that activity. This spurred private provision of electricity by investor-owned utilities and led to the creation of several new state commissions in these areas. Regulation in the 1960's also experienced some change and activity because many of the issues that were publicly acknowledged in the 1970's had already begun to take shape in the 1960's. The regulatory community was becoming involved in new activities such as plant siting issues and consumer affairs.

THE DEVELOPMENT OF FEDERAL REGULATION[1]

The primary justification for federal involvement in the regulation of industry has historically been the Interstate Commerce Clause of the U.S. Constitution, which gives Congress the power to regulate commerce among the states. These powers have been interpreted by the courts as giving the federal government significant regulatory authority. The commission method of regulation was adopted at the federal level, although the authority of the several regulatory commissions was based on functional specialties rather than the geographical model of state commissions.

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[1] See Part V for a more detailed examination of federal regulation.

RELATIONS AMONG FEDERAL AND STATE REGULATORY AGENCIES

Historically, the courts have ruled that in the case of a direct conflict between federal and state regulations, federal regulations have precedence. The courts have also ruled that in the absence of federal regulation, the states should not be held back from promulgating their own rules in anticipation that it would have some indirect impact on interstate commerce.

Recently a new area of concern has arisen which may require a greater degree of coordination between state and federal government and/or between adjacent states. Some gas and electric utilities operate in more than one state. With the exception of the interstate sale of bulk power, they are regulated entirely by state commissions which may apply conflicting standards or rate setting criteria to the same corporate entity. Under these circumstances, it is possible for a firm to include certain costs in its rate base in one state, which are not allowable in another state, causing customers to pay different prices for the same service because they live in different regulatory jurisdictions. Further, they may be paying more than their share of the costs if utility firms were able to pass along those costs originally proposed for customers in other states. Conditions such as these may result in a greater need for intergovernmental cooperation both among states and between federal and state regulatory agencies.[1]

IMPLICATIONS FOR FUTURE REGULATORY TRENDS

The history of regulation shows the evolutionary nature of this field and the continuous need for regulatory institutions to innovate as political, economic and technological conditions change. Regulation by adjudication gave way to regulation by legislation, which was later replaced by franchising agreements. Each of these approaches had

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[1] See Part V for a more detailed description of federal/state relations.

serious drawbacks, even in times when the regulatory environment was relatively less complex. With the advent of modern public utilities having the technical capability to provide their services at relatively greater distances, the need for regulatory authority with relatively wide geographic jurisdiction, expertise and continuity was evident. This need has thus far been addressed by the state regulatory commission, whose scope of authority and breadth of activity has expanded greatly since the first modern day commissions were founded in 1907. Further growth in technology allowed bulk interstate sales and led to federal regulation of gas and electric utilities. Future technological advances, such as improved power pooling techniques, may lead to the development of new forms of regulation. The lesson from the history of regulation is clear on this point: regulation follows technology.

Another important trend is in the growth of federal regulation of utilities. The amount of federal regulation has grown over time as more public utilities became involved in interstate commerce and the mandated scope of regulation grew. For the forseeable future there is no reason to doubt a continued growth in federal regulation in direct proportion to the growth in interstate bulk sales and mandated regulatory activities.

PART III

CONCEPTS IN STATE REGULATION

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(continued)

INTRODUCTION: UNDERSTANDING TRENDS AND CHANGE IN REGULATION

In order to aid interpretation of the regulatory trends to be identified, we shall explore some hypothesized patterns in utility and regulatory evolution and some explanations for rigidity and change in regulation.[1] We shall then present a framework for planning regulation, i.e., for identifying, categorizing, and permitting choice among the diverse aspects of the regulatory situation. Such a framework can be used as a type of checklist to plot and anticipate regulatory trends.

Change in the Industry

Change has, indeed, been an outstanding characteristic of the utility industry. Growth in electric power generation has been a "twentieth century phenomenon" (Fainsod and Gordon 1941, p. 298). The development of the steam turbine and transmission technology are but two examples of the technology that made this growth possible. The power utility industry has seen a steady stream of technological innovation since its inception although some forecast that the rate of innovation has leveled off. That the extensiveness of electricity utilization has increased dramatically even within the second half of electric power's roughly 80 year history of growth is illustrated by the following remarks by a leading scholar of regulation of the preceding generation. As late as 1941, Merle Fainsod could write:

> Lighting and minor appliances still account for the bulk of residential consumption. Though major appliances such as refrigerators and washing machines are coming into wider use, more than three-quarters of all American families are still without electric refrigerators and more than two-thirds without electrical washing machines. The use of electricity for cooking, heating, and air conditioning remains largely unexploited. The high cost of appliances, restrictive rate schedules, consumer inertia, and lack of purchasing power all combine to limit domestic utilization of electricity. (Fainsod and Gordon 1941, p. 299).

Thus regulators have faced the unenviable task of specifying workable controls for a changing industry and consumption pattern. The traditional regulatory commission has attempted to regulate this changing environment through the seemingly paradoxical instrument of writing rules and standards. It is true that regulation has sometimes attempted to build in mechanisms to automatically respond to change, e.g., fuel adjustment clauses. But the regulatory process has perhaps more often been one of catch-up responses to utility and societal change with continual, costly, interactional, rule making or standard setting.

With the acceleration of change in the 1970s as long-term growth patterns shifted, and power production technologies both diversified and faced obstacles from fuel and environmental constraints, the need for inventiveness and innovation in regulation itself has perhaps never been so evident. Thus identification of regulatory trends can serve the function of identifying new and promising regulatory instruments for managing this change.

THE EVOLUTION IN THE REGULATION OF PUBLIC UTILITIES

Below are described models of utility and parallel regulatory evolution. These models have not been offered solely in the context of electric or gas utility regulation, and have been created at least partly with the federal commissions in mind. But they clearly do apply to the activities of state public service commissions and utilities

and provide the beginnings of a framework from which future trends may be anticipated.

Glaeser (1957) and Farris and Sampson (1973) have each identified models having a series of stages in the evolution of public utilities. Shepherd (1973, 1974, 1975) and Wilcox and Shepherd (1975) have presented a model of the linked evolution of utilities and regulatory agencies. Each is described below in detail and collectively provide a framework to assess possible trends.

Four Epochs: Glaeser

Martin G. Glaeser (1957) specifies four overlapping epochs in the development of public utilities in the United States. In the first, the "promotional epoch" (colonial times until about the Civil War), public utilities were tools for developing the country and had to be encouraged. Glaeser (1957, p. 15) notes that "it was in most respects a period of beginnings in the establishment of facilities, in the exploration of their techniques, in understanding the economic principles of operation, and in adapting to them an inherited system of social control." Regulatory forms included common law, statutes, and franchises and charters. Franchises encouraged development through exclusive grants of service rights. Examples of utilities in this period include turnpikes, canals, and the early railways.

The second period, the "competitive epoch" (about 1850 to 1900), was characterized by intensive technological development that supplied markets able to support several competitors. Exclusive franchises gave way to general and permissive grants. Examples of utilities developing in this period include railroads, who embarked on a great wave of expansion, and electric power production.

The third era, the "monopolistic epoch" (1880s to Great Depression), came, according to Glaeser (1957, p. 16), "after the competitive urge had done its worst by generating in turn all the evils of cutthroat

competition, such as discrimination and rebating and the corruption of legislative bodies" and saw "a rebirth of regulation." A new regulatory form, the administrative commission, was created to control these abuses. But it soon became evident that, because the public utilities were "natural" monopolies, it might be wiser to change the emphasis from enforcing and controlling competition to one of recognizing and regulating monopolies. The progressive movement led the change, and the railroads were subject to it first. But, as we have seen, electric and gas utilities soon followed with the appearance of state public service commissions after 1907.

The fourth period, that of "national coordination and planning" (Depression to the present), has involved, according to Glaeser, the development of national policies that join or integrate heretofore separate regulated industries (e.g., the bringing together of railroads, trucks, and barges in the Interstate Commerce Commission). Frequently, both public regulation and public ownership are employed to reach the national policy goals. The rise of public power production during the 1930s is an example.

Glaeser's description of the stages of utility development is intuitively appealing in the depiction of a steady progress in industrial development accompanied by regulation established in the public interest. But it can be subject to serious criticism, not the least of which is the question of whether his interpretation of historical events is supportable. Much relatively recent research has argued that regulation was often sought by industries for their own protection, rather than being imposed in some public interest.[2] Although the distinction is not always made clear in this recent literature, it has been argued that regulation which is not directly sought at the outset is often "captured" later on to conform to the industry's major interests (Hilton 1966, Kolko 1965, MacAvoy 1965). And, despite the coordination represented by recent legislation such as the National Energy Act, it does not really appear that a period of "national coordination and planning" in regulation

has occurred. The regulatory literature is full of cases and criticisms of the lack of coordination among the Federal transportation regulatory agencies, for example (Burby 1971).

The model inherent in Glaeser's overlapping epochs permits one to characterize the life cycle of given utilities, as well as historical periods in the development of utilities in general. The railroads may be the easiest example we could take here, advancing as they did from promotion in their early days, to competition in the post-Civil War era, to monopolistic supervision under the ICC by the early twentieth century, and to coordination (at least in pricing and services) with motor carriers and barges by the end of the Depression. Electric utilities have also perhaps passed this route, at least part way. Because the railroad example is so prominent, however, the danger exists that it will be generalized to apply to all utilities. But all utilities are not like railroads. There is no a priori reason to suppose that complex processes like regulation and economic development can be confined into the same very few, simplified categories or stages.

Five Stages: Farris and Sampson

Martin T. Farris and Roy J. Sampson (1973) have developed a related model of utility development. They specify five stages in the evolution of a utility, with some amount of overlapping of stages and with utilities of recent origin possibly skipping an earlier stage. For each stage Farris and Sampson (1973, p. 10) discuss the utility's "public image," the "degree of social control," and the "sophistication of service."

In the first or "promotional" stage, which is similar to Glaeser's, the utilities were viewed favorably and highly sought, given tax advantages and gifts including grants of land, subsidies, and other incentives. They were subjected to little restrictive regulation, a minimum of social control and even in some cases a willingness to

look the other way when abuses occurred. They had crude technology, gave erratic service, and displayed primitive management and rate-setting. Examples include canal facilities during the "Canal Era" and early manufactured gas and communication utilities (Farris and Sampson 1973, pp. 10-11).

The abuses and poor performance of the promotional stage created a negative public image for the utilities in the next period, the "competitive" stage. As a result, social control was increased, with the control taking the form of sponsorship of competing franchises as checks against one another. Evidence is apparent in the development of gas, transit, telephones and electric utilities, for example. Like the promotional era, service and management were poor and although pricing practices improved, firms had not learned the advantages of economies of scale and remained small. The increased competition, in fact, led to economies that hurt service further (Farris and Sampson 1973, pp. 11-12).

In the "monopolistic" stage, the benefits of economies of scale and monopoly were recognized and successfully sought despite initial attempts by government to promote competition. Beginning with transportation, however, society decided reluctantly that the monopolistic form was inevitable in utilities. Since the perceived key to maximizing the economic benefits of a monopoly was effective regulation, many state regulatory commissions were established, for the most part in the early twentieth century, to secure the benefits of monopoly while sparing the public its abuses. Regulation was held to be a substitute for competition. Under regulation, the public image of utilities was good as service improved and prices fell due to regulation and economies of scale. Social control through regulatory commissions was, for a while, relatively effective. Sophistication of technology and management was relatively high; modern pricing methods were developed. Abuses in such areas as speculation and intercorporate dealing developed. As the period ended, public disillusionment, frustration and doubt were apparent (Farris and Sampson 1973, pp. 12-14).

The fourth period, the "regional stage," saw expansion of utilities to cover states and even regions. Sometimes holding companies linked several utilities. The public image was one of exploitation, frustration, fear, and distrust. Social control responded with extensive investigation and publicity, Federal regulation in the form of new commissions (in the 1930s) who could deal better than the state commissions with regional utilities, and the sponsorship of federal competition, including public enterprises in such areas as power production. Utilities grew more efficient, service quality improved, and a new and favorable public image developed (Farris and Sampson 1973, pp. 14-15).

In the fifth stage, "cooperation," which utilities such as power, gas, and telephone have recently entered, utilities have developed several means of cooperating with other utilities in the same field. For example, public and private power producers have developed interconnections and power pools. National power and energy planning have been increasing. One infers from Farris and Sampson's comments about the fourth stage that the public image of the fifth stage is good, though they do not say so explicitly. The restrictive social controls of the previous era are questioned in a period in which the emphasis is on cooperation. And service levels are highly sophisticated, pricing forms highly advanced, and management perceived as very efficient (Farris and Sampson 1973, pp. 15-16).

Farris and Sampson's model is obviously very close to Glaeser's, though they are more explicit about the characteristics that distinguish the levels and permit comparisons (i.e., public image, social control, sophistication of service and management). Farris and Sampson substitute "regional" and "cooperation" periods for Glaeser's "national coordination and planning" period. Increased coordination or cooperation, and planning, does seem to occur in both models, if in possibly different areas and beginning at possibly different times.

But Farris and Sampson may be subject to the same criticisms as Glaeser. They present regulation largely as a public-spirited means of

social control continually directed at and adopted to the abuses of the industry. On the contrary, as noted above, many recent writers have viewed regulation as something which is actually desired and even acquired by the industry for its protection. Such a perspective would view a period designated as "cooperation" or "coordination" as possibly one in which the industry's partiality to the regulation is simply more public, and its ability to consort or even collude with other members of the industry or other utilities or other firms in related industries is simply more blatant. "Cooperation" between public and private, or among private, would then merely be evidence perhaps of "capture." Or cooperation may be merely a facade to legitimize actions of the industry. We do not need to accept these contrary views uncritically. But the support for this and other views suggest at best an oversimplification in the model. Perhaps both public protection, and industry protection, have characterized utility regulation at different times and/or different locations.

Farris and Sampson's praise of the efficiency of the modern utility takes no account of the concerns of recent writers that regulation may lead to distortions from efficiency in the operation of the regulated firm[3] as well as the disagreement over whether or not innovation is sparked or slowed.[4] In addition, it is not at all clear that the management of utilities has been as efficient as Farris and Sampson claim. These are really empirical questions that have only recently begun to receive study, and are likely to see a great deal more in the future.

Note that both the Glaeser and Farris and Sampson models imply a path for the evolution of regulation in their description of how utilities have evolved. These implied models are extracted in Chart 1. Since the original stages focus on the utility rather than the regulation, we of course run the risk that the respective authors would not be satisfied with these stages as adequate descriptions of the regulatory evolutionary pattern. But we present them as part of the task of this project to try to identify and explain trends in regulatory evolution.

Chart 1: Three Models of the Evolution of Utility Regulation

Glaeser (1957)

Promotional Epoch:
- common law
- statutes
- franchises and charters (exclusive grants)

Competitive Epoch:
- exclusive franchises - general and permissive grants (freer entry)

Monopolistic Epoch:
- administrative commission: enforcing competition - recognizing and regulating monopolies

National Coordination and Planning:
- administrative commission with integrated policies toward several related industries
- public ownership

Farris and Sampson (1973)

Promotional Stage:
- positive incentives including tax advantages, grants of land, subsidies

Competitive Stage:
- Competing franchises
  - -established to try to control abuses

Monopolistic Stage:
- state regulatory commissions
  - -tried to control abuses while getting benefits of monopoly
  - -initially successful, but utilities found ways to get around them

Regional Stage:
- investigation and publicity
- federal regulatory commissions
- federally sponsored competition, including public enterprise

Coopération Stage:
- restrictive controls questioned

Shepherd (1973-75)

Stage I:
- patents

Stage II:
- regulation by commission is sought to achieve market control, legitimize the industry, constrain interest groups

Stage III:
- defense: regulatory mechanisms protect firm from new competition, technologies
- regulatory agency has inadequate funds, talent to perform review process

Stage IV:
- new competition and new technology threaten to overwhelm the regulated situation
- results:
  - -reversion to competition
  - -public ownership
  - -extended survival of highly nonoptimal regulation

Four Stages: Shepherd

William G. Shepherd's model (1973, 1974, 1975 and Wilcox and Shepherd 1975) discusses the utility evolutionary pattern as a "life cycle." Regulation in this life cycle is seen as part of a basic social contract: a monopoly is officially granted, in exchange for a degree of public control (Wilcox and Shepherd 1975, p. 348). In Stage I. invention of the system is often accompanied by control through patents, after this brief period, Stage II sees growth of the system, which may replace an existing system, as buses superseded trolleys. The price structure comes to reflect cross-subsidies among system users as well as to distinguish the lucrative and barely profitable markets. The utility actually seeks to become regulated in order to achieve permanence, legitimacy, and market control (Wilcox and Shepherd 1975, p. 349), whereupon the regulators promote the service, making it universally available. Thus regulation begins in harmony with the regulated interest. In fact, "the structure of mutual interests, the profit expectations, and the basic terms of exchange (especially the supplier's rate level and structure)... precede regulation" (Wilcox and Shepherd 1975, pp. 349-350). Regulation then merely legitimizes and smooths interest-group compromises (Shepherd 1973, p. 99).

In Stage III, the utility has saturated its market and developed its technology. It now goes on the defense. It fights competing new technologies or tries to modify the new technologies to fit the utility's own interests. Rate structures do not fit as well, and the utility is confronted with challenges from users in profitable markets who are charged more than they think they ought to pay, and from parties who may be subject to negative externalities produced by the utility. Regulation, meanwhile, suffers from inadequate funds and talent, and cannot perform the review process it has accepted in exchange for granting the monopoly. Since the utility is not sanctioned, responsibility for service quality ends up with the regulators. Since the only penalties are political, such as open criticism, which can hurt

the regulators as much as the utilities, the utility and the regulators develop a shared objective of simply minimizing political repercussions, and avoiding redressing inequities (Shepherd 1975, p. 230; Wilcox and Shepherd 1975, p. 351).

In Stage IV the utility finally yields to the pressures of technology and competition and may revert to a component of a competitive system. Or if externalities or other social effects are particularly important, it may become a public enterprise. But regulation has followed a path of evolution reversed from that of the utility, a path that may shield the regulated firms and freeze their markets. Inefficiencies result and "'better' regulation of rates--by hiring more brilliant commissioners or staffs, giving them bigger budgets, etc.--does not correct the basic structural problems or the inefficiencies" (Shepherd 1975, pp. 232-233). Thus regulation may survive indefinitely, far beyond the point at which it ceases to be socially optimal.[5]

Shepherd explicitly recognizes the life cycle aspects of utility evolution, freeing his model more from the historical period ties that heavily influence the Glaeser and Farris and Sampson approaches. And he tries to integrate more explicitly the parallel (and "reversed") cycle through which the regulation passes. He recognizes inefficiencies in regulation and describes regulation as being essentially industry protective in character, arguing that it is sought by the utility and then used to protect the utility from competitors. Shepherd may, of course, be going too far the other way; there may be utilities that are relatively more efficient and utilities which do not seek or prefer regulation. This is really an empirical question that deserves further study, though there is evidence[6] accumulating that utility regulation does in fact suffer from at least some of the criticisms that theorists have directed at it. Furthermore, it is not at all clear that utilities in all areas follow this pattern. "Natural" monopoly may be necessary in the interest of efficiency for very long periods. This may be the case, for example, in some areas of electric power production.

Shepherd's categories, like those of Glaeser and Farris and Sampson, are really only sketched, not fully described and developed. He acknowledges this, calling his stages "only crude summaries of complex interactions" that "await a complete formal analysis" (Shepherd 1975, p. 227, note 3). In Shepherd's model, the utility really does not go through much of an evolution once it is established; it is the environment which changes (i.e., new competing technologies appear) and which a fairly static utility tries to control through the instrumentality of regulation. But there is a growing literature on aging in organizations and the processes of change which accompany and govern it (e.g., Kaufman 1971 and 1976; Downs 1967, Chapters 2 and 13). Extensions of Shepherd's model could employ it.

The regulatory life cycle inherent in Shepherd's approach is summarized in Chart 1.

THE LIFE CYCLE OF AGENCIES

Bernstein's Life Cycle of Regulatory Commissions

Processes and patterns of change in organizations over time are not well understood in the literature. Though work in those areas is growing, there is especially little about processes of creation and of decline or reduction, and termination. These generalizations apply to regulatory agencies, as well as to utilities and any other organizations involved in the regulatory process. The widely cited and summarized life cycle theory of regulatory agencies presented over twenty years ago by Marver Bernstein (1955, Chapter 3), or any extension or elaboration of it, has still not been subject to extensive empirical test (Meier and Plumlee 1977 and 1978). Similarly, Anthony Downs's (1967, Chapters 2 and 13) explanation for the life cycle of bureaus does not seem to have been accorded much empirical study. These works therefore remain major, if largely untested statements, and warrant some consideration here. They can be suggestive of the ways in which, and perhaps the reasons why, utility regulation changes over time.

Marver H. Bernstein (1955) has argued that although there are "unique elements" in the experience of each agency, "the history of commissions reveals a general pattern of evolution more or less characteristic of all," with "roughly similar periods of growth, maturity, and decline." The length of periods may vary across commissions, and periods may sometimes be skipped, but there is yet a "rhythm of regulation" that suggests a "natural life cycle" (Bernstein 1955, p. 74). Of note is Bernstein's argument that the cycle can repeat in the same agency. Four periods are identified: gestation, youth, maturity, and old age (see Chart 2).

Gestation may require twenty or more years, in which a rising distress leads to the formation or activation of groups who demand legislative remedies to protect their interests. After a struggle, a statute containing "vague language" and reflecting "unsettled national economic policy" is passed. It is a compromise, which largely succeeds in passage only because of crisis or near-crisis conditions. Groups desiring the regulation want immediate relief from abuses of business, and do not consider longer-range goals or policy in the area. The statute will often be out-of-date because of the length of the struggle (Bernstein 1955, pp. 74-79).

During the second phase, Youth, the agency is crusading and aggressive, and operates in a conflictual environment. Lacking administrative experience, possessing vague objectives and untested legal powers, the commission faces well-organized and experienced opposition from the regulated groups. The agency quickly gets into litigation in order to determine the scope of its powers, but the legal proceedings are "highly specialized, technical, and frequently obscure" to the public. The regulated industry tries to determine appointments to the commission and tries to reward and punish regulators who are, respectively, for and against them. Loss of public support and political leadership for the regulation occurs as the groups that backed the regulation tire and retire from the field, believing "they have earned a rest from political turmoil;" as those who supported the legislation assume that administration

Chart 2:
Bernstein's (1955) Life Cycle of Regulatory Commissions

Gestation:

- 20 years or more
- sparked by crisis
- marked by struggle
- regulation is compromise
- regulatory statute out of date when enacted
- regulation emphasizes short-term over long-term considerations

Youth:

- crusading, aggressive in conflictual environment
- agency lacks experience
- agency has vague objectives
- untested legal powers are tested, but legal process is incomprehensible to public
- experienced, well organized opposition from industry
- loss of public support and political leadership as groups who pushed for regulation retire; regulated industry successful in rewarding regulators and affecting attitudes

Maturity:

- passivity/apathy; adjusts to conflict it faces
- agency lacks Congressional and public support
- acts as manager rather than policeman
- relies on precedent and routine
- maintains good relations with industry
- most of time spent in litigation
- parochial professionalism
- backlog of cases develops
- Congress and Budget Office refuse appropriation increases
- "becomes a captive of the regulated groups"

Old Age:

- debility
- procedures sanctified
- "working agreement" with industry to maintain status quo
- "recognized protector of agency"
- Congress and Budget Office refuse funds
- staff declines in quality; poor management
- agency fails to keep up with societal change

But scandal/emergency/crisis can trigger new drive for regulation: cycle repeats

of the statute will take care of itself; as defenses in the courts are technical and remain incomprehensible to the public; as the regulated industry begins to have success in changing public attitudes and in affecting the commissioners' attitudes as well by such ways as holding out the implicit promise of a future lucrative position in the regulated industry; as legislative champions find no advantage in continued advocacy and intra-party differences are smoothed over; and as the "inchoate, relatively unorganized (and frequently disorganized) public" is is no match for cohesive industry groups; leaving the commission in "splendid isolation." The zeal of the commission in its youth itself arises to a large degree from "the general political setting," including the prevailing ideology of the proper role of government. This of course may be different for agencies created at different times (Bernstein 1955, pp. 79-86).

In Maturity, the third phase, the agency undergoes a process of devitalization. Lacking external congressional and public support, the commission adjusts itself to the conflict it faces. It becomes more like a manager than a policeman, and more like the business managements it supposedly regulates in viewpoint. It relies increasingly on precedent and routine; precedent, rather than prospect, guides the commission. Without external pressure, conflicts are avoided; the agency seeks to maintain good relations with the industry and to escape unpleasant interpersonal relations. In order to avoid trouble from charges of unfairness that may be substantiated during judicial review, the agency allows private parties easy challenge to its actions and spends most of its time in adjudication. Professionalism grows in the staff, but is parochial, and tends to encourage the emphasis on precedent. As a result of these factors, the agency develops a large backload of cases. Congress and the budget office will not approve larger appropriations to hire staff to reduce the backlogs because they believe the agency is not well-managed. Thus the commission finally becomes a captive of the regulated groups (Bernstein 1955, pp. 86-91).

Finally, in phase four, Old Age, the passivity and apathy of phase three deepens into debility. The agency's procedures undergo sanctification. It develops a fixed working agreement with the regulated parties that leads to maintenance of the status quo and establishment of the agency as recognized protector of the industry. Congress and the Budget Office notice the debility of the commission and refuse additional aid, fearing that increased adherence to old procedures and policies rather than efficiency would result. The staff declines in quality, and the agency becomes more than ever dependent on regulated industry for staff. The agency is poorly managed and exhibits doubt about the objectives of regulation. The commissioners as a group develop certain understandings among them which act as powerful deterrents to efforts to improve their managerial quality. The agency fails to keep up with changes in technology and economic organization, and is insensitive to its wider political and social setting. Scandal or emergency, i.e., a crisis, can, however, by dramatically highlighting the failures of the regulation, trigger a new drive for regulation. The cycle repeats (Bernstein 1955, pp. 91-95).

Unlike Glaeser, Farris and Sampson, and Shepherd, Bernstein focuses his life cycle arguments mostly on changes in the regulatory agency rather than on the regulated party, other parts of the regulatory environment, or some combination of these. Although Bernstein's model is probably the classic statement of the regulatory life cycle in the literature, it can be subject to a number of criticisms (see, Sabatier 1975, for a discussion of some of these). Bernstein mixes description and explanation, sometimes requiring the reader to interpret reasons for the importance or relevance of a given factor or reconstruct them from considerations of the rest of his argument and the examples.[7] He is literary at the expense of clarity (this is also true of Glaeser to some extent), and tends to use metaphors and dramatic language that brighten the reading but add imprecision to the analysis. To some degree this is a reflection of an older style of writing, but it does seem to interfere with specification of the model.

For example, Bernstein, after referring to the "trial by legal combat" that occurs during initial litigation of the regulatory statute, writes that

> The arena in which the legitimacy of regulation is attacked and defended is highly specialized, technical, and frequently obscure. Few non-lawyers are able to follow the legal proceedings, which appear incredulous or mysterious to the uninitiated (Bernstein 1955, pp. 81-82).

One can infer that the significance of the obscurity of the legal process is that the general public is unable to follow the course of the litigation and offer support in the agency's fight against skilled utility lawyers. But Bernstein does not actually say this. Moreover, he doesn't state who the "uninitiated" are who are important to his model, nor does he specify what courts and/or what parts of the legal process are the subject of his comments. In addition, one can ask if Bernstein means that it is the legal process alone that is technical and obscure, or whether it is the subject of the litigation and the legal issues debated that are of this character? Or is it both? The difference is important to building one aspect of an explanation for the evolution of the agency.

Sometimes the difference between stages is unclear. In both phases three and four, for example, Congress and the Budget Office refuse additional appropriations, in Maturity because they believe the agency is not well-managed, and in Old Age because they fear increased adherence to old procedures and policies rather than efficiency will result (Bernstein 1955, pp. 90-93). It is not immediately apparent that Bernstein has made any real distinction here.

Interestingly, Bernstein's "working agreement" seems somewhat like Shepherd's "social contract." But Bernstein ignores the possibility that the regulation was sought by the regulated party from the outset, for its own protection, an assumption that is central to Shepherd's model. Perhaps what appears with respect to consumer or "public interest" goals as debilitation is really only evidence of effective service and

protection. As a number of writers on regulation have observed, regulation is often explicitly supposed to promote and protect the industry (Sabatier 1975, p. 303).

In the end, any life cycle model requires empirical support. Bernstein offers anecdotal support using the federal agencies, but the generality of his model requires systematic support from the experience of agencies at other levels, as well as more careful and complete analysis of the careers of the federal agencies. Because Bernstein does not specify the length of any period subsequent to "Gestation," however, it is hard to do this (Sabatier 1975, p. 304). Would we really want to argue that an agency that, say, was apparently "vigorous" and "youthful," in Bernstein's language, for fifty years and then passed through Maturity and Old Age in five years, to be reborn in crisis as a youthful agency, followed Bernstein's life cycle? Maybe it would be more accurate to describe such an agency as normally "youthful," and look for reasons other than an inherent life cycle for its occasional periods of debility. Similarly, an agency that seems perpetually in "Maturity" or "Old Age" may not be in a cycle. It may have essentially started out that way.

But Bernstein's life cycle model is intuitively appealing. The occurrence of initial activism, which soon fades, is a sufficiently remarked-upon phenomenon throughout regulation to suggest the existence of underlying pattern and explanation. Bernstein colors such a portrait well, if occasionally vague about the logic or the details.

Downs's Life Cycle of Bureaus

The life cycle of regulatory agencies can be viewed as a special case of the life cycle of bureaus. Life cycle theories such as Bernstein's that seek to explain the ultimate rigidification and "capture" of regulatory agencies are, in fact, frequently generalized beyond the independent commission context in which Bernstein first developed it.

There are important differences, of course, between the so-called "independent regulatory commission" and the regulatory office, division, or department. The commission is a bureau that has a group rather than single executive (though the chairman may be given major administrative supervisory responsibility) and the relation of the regulatory unit to the legislature and to executive departments and elected officials may differ. Such differences, as well as others, may have consequences for the performance of the unit, but regulatory agencies may at least have their bureaucratic setting in common.

One can argue, however, that it is not structural differences of this kind per se but, rather, differences in the extant incentive system facing regulators, that best explain any performance differences (or similarities). Structural differences, of course, may affect the incentive system. In addition, the preferences of the regulators for various rewards may vary, though the variation may be no different than it is for bureaucrats in general. Anthony Downs and some other recent writers, mostly economists (Tullock 1965), have applied an approach of this type to study bureaucracies, including regulatory agencies.

In spite of important differences, both commissions and offices/divisions/departments are to some extent hierarchical, bureaucratic units. Further, regulators in both types face somewhat similar incentive systems that derive from the nature of the regulatory relationship. This permits a somewhat generalized discussion of regulatory agency behavior. We do need, of course, to remain sensitive to the effects of structure on the incentive system.

Anthony Downs (1967, Chapters 2 and 13) has developed a model of the life cycle of the bureau that, with appropriate adjustment, may be applied to both departmental and commission forms. Among Downs's basic assumptions are that bureaucrats can be viewed as rational, in the sense of acting with consistency with respect to given goals, and that an important component of their goal set (which he also specifies) includes basic self-interest. In the rational choice approach, behavior is

explained as the result of individuals rationally pursuing their goals in an environment characterized by differentially distributed goal satisfactions, i.e., in effect, differentially distributed incentives. Downs goes on to distinguish several types of bureaucrats based on differences in purely self-interested and in mixed motives. These types are used to explain occurrences in the bureaucratic and, by implication, the regulatory life cycle.

There are several defenses in the literature of the use of the rational choice and self-interest assumptions, as well as the employment of rational choice models in general (Downs 1957, Buchanan and Tullock 1962, Riker and Ordeshook 1973); we will not review them here. One important argument is that the rational choice approach may permit explanation and prediction of behavior in different or changing settings, given stability in the subject's goal set.

Downsian Bureaucrats

In Downs's typology (see figure 1), climbers seek only their own self-interest goals of power, income, and prestige; conservers seek only their own self-interest goals of convenience and security, seeking to retain what power, income, and prestige they have; zealots are mixed-motive in that they possess similar self-interest goals, but also strongly desire to achieve or implement a relatively narrow policy, program, or concept; advocates are mixed-motive and value in addition to self-interest goals the broader goals or functions of the organization; and statesmen are mixed-motive and desire in addition to self-interest to achieve goals relating to the benefit of society as a whole. Note that the mixed goal types possess mixed goals that represent levels of a hierarchy: organization, society, ideation (policy, concept).

Downs's typology can be produced as a subset of a systematically generated typology of bureaucrats as agents possessing self-goals and other-goals (see Mitnick, forthcoming 1979). A category omitted by Downs

Level of goal	Self-Other=Goal Dimension: Self-interest only	Self-interest plus other interest
individual (self) only:	climber	--
	conserver	--
individual (self) plus:		
individual other	--	loyalist
organizational other	--	advocate
societal other	--	statesman
ideational other	--	zealot

(a)Based on Downs (1967).

Figure 1: Typology of Bureaucrats(a)

that emerges in this process may be termed the "loyalist." This is the case in which the bureaucrat is acting for another individual; it essentially completes the hierarchy.[8]

Identification of a "loyalist" type should have utility beyond pointing out how the Downs typology is perhaps incomplete when more systematically generated. Loyalists may play major roles in situations where, for example, a charismatic figure heads an agency over a relatively long period of time (e.g., J. Edgar Hoover), or an elected official seeks to gain control of a bureaucracy by appointing lower level officials who are loyal primarily to him.

Downsian Bureaucrats and the Life Cycle

Downs (1967, p. 5) argues that bureaus originate in one of the following ways: They are begun either by: (1) followers to perpetuate the ideas of a charismatic leader, (2) groups who see a need to perform a given function, (3) as a division split off from an existing unit, or (4) through the entrepreneurship of a group promoting a policy that gains support. It would appear that all except the first type may often apply to the founding of regulatory agencies, though the first type is conceivable where, for example, a social movement is headed by such a leader.

Once started, the bureau is dominated initially by advocates or zealots, must seek external support to survive, and begins to grow rapidly. Those who pushed for the establishment of the bureau, whether followers of a charismatic leader, groups seeking to have a function performed, or entrepreneurs for a policy, are likely to be represented in the personnel of the agency whose activities they care so much about. In addition, zealots who pushed for separation of a bureau from the larger unit may also be found in the new bureau. Note that the followers of the charismatic leader may be labeled "loyalists" in our extension of Downs's model. Members of the larger unit from which the bureau is split off may install loyalists in the new agency to retain control. Where groups

external to the government have sought the new agency, it is likely that members of these groups will be placed in it in leading positions. At any rate. recruiting for the new agency will probably be most successful, of course, among those who favor the agency.

This description is somewhat consistent with Bernstein's discussion of the phase of "youth," in its depiction of the likely crusading spirit or zealotry of the early agency. But it is also consistent with a view of regulatory establishment that emphasizes protection of the regulated party, e.g., Shepherd. The regulators could conceivably be active advocates of promotion of the industry.[9] This is an aspect that, as with the rest of life cycle analysis, requires empirical study.

The agency must convince groups with influence over needed resources, e.g., key elected officials and the legislature, that the agency's services are desirable. Zealots and advocates will seek support both to allow continuation of their program and organization, and to simply satisfy their own self-interest in survival of the agency. Similarly, we can argue that loyalists will seek support both to serve the interests of their principal and to help themselves. Recall that Bernstein implies that the loss of public support in the early career of the agency is an important factor in the capture of the agency.

A bureau is said to reach its initial survival threshold when it has reached a size sufficient for it to offer useful services, and an age sufficient for routinized relationships to have developed with its major clients (Downs 1967, p. 9). It is especially vulnerable before this point. This threshold is generally attained after a period of rapid growth. Bureaus that split off have often already reached the threshold. Bureaus born new try to build up to it rapidly before being blocked by other bureaus or by groups which oppose their functions, or before they run out of resources. Newly established bureaus whose zealots have active counterparts in their environment may be relatively more succesful. We can add that loyalists may count on their powerful principals to supply or mobilize sufficient support to guarantee the bureau's attainment of such a threshold.

The major effects on the growth and decline of bureaus have their sources in factors in the environment of the bureau, though relatively small changes in the composition of the personnel in the bureau may have substantial impact. Downs argues that if officials in key posts are preponderantly of one type (conservers, zealots, etc.), "the bureau and its behavior will be dominated by the traits typical of that type" (Downs 1967, p. 11). He explains the dynamics of growth and decline largely in terms of changes in bureau composition due to changes in the environment. Acceleration in growth may begin when the bureau's social function gains in importance and the bureau's sovereign directs it to expand. The expanding bureau atrracts climbers, who see opportunities for advancement, and scares away conservers. The climbers rise, so that the bureau is increasingly directed by them. The climbers innovate and seek expansion in order to better themselves. The bureau requires innovators to serve its expanded function. So growth accelerates. Brakes on acceleration include competition from other bureaus, the increasing difficulty of getting impressive results as the organization grows larger and more complex and encounters problems in drawing more talent to an already talent-rich agency, and the internal check of conflicts among ambitious climbers.

Deceleration mirrors acceleration up to a point. Forced by a decline in the importance of its social function due to decrease in size, the bureau finds that climbers jump out of the bureau or lose hope of substantial promotion and become conservers. The bureau is then less willing and able to take advantage of innovation and expansion opportunities. The deceleration is not perfectly symmetrical with the acceleration because the climbers who remain will still rise more quickly than the nonclimbers; because the number of high positions sought and filled by climbers will rise faster during acceleration than it falls during deceleration; and because of the argument that since all officials, including both climbers and conservers, resist a drop in their resources, the resistance to reduction will be greater than the enthusiasm of growth.

In general, Downs argues that bureaus will seek to expand because an organization that is rapidly expanding can attract better personnel and more easily keep the best personnel; can provide personnel in leadership positions with increased power, income, and prestige if expansion is successful; can reduce internal conflicts over scarce resources and rewards; and can improve the quality of its performance and its likelihood of survival (which may satisfy both loyalty and self-interest). In addition, public bureaus may seek to expand because officials are not subject to the market constraint of measuring marginal gains against marginal costs; they receive greater rewards for increasing rather than for reducing expenditures. Note also that expansion of agencies in which loyalists play a major role may also satisfy the desire of the loyalists' principal for more power, as well as satisfy the loyalists' own self-interest.

Downs (1967, p. 18) introduces a life cycle simile by noting that "bureaus, like men, change in predictable ways as they grow older." In particular: (1) They learn to perform better. (2) They develop formalized rule systems that cover more situations and in effect record the bureau's experience. This improves performance in previously encountered situations, tends to divert officials from social function performance to rule conformity, and increases the structural complexity of the bureau and its consequent inertia from sunk costs. (3) They shift their goals in practice from performing certain social functions to survival as the growing rule structure increases the importance of conservers. (4) They modify the formal bureau goals in order to guarantee the survival of the bureau's administrative mechanism. This stems from the career commitments of officials who wish to avoid losing the sunk costs of building status and seniority, looking for a new job that is harder to get at higher ages, and so on. (5) Their administrative component increases, because lower level workers are discharged first in shrinkages; because the greater number of functions performed by the older bureau requires more coordination; and because, unless modern business machine technology happens to be applicable to administration, the production or lower level jobs may be more subject to mechanization, which is more likely to be introduced with age.

The effects of age lead Downs to cite his "Law of Increasing Conservatism: All organizations tend to become more conservative as they get older, unless they experience periods of very rapid growth or internal turnover." Thus "the older a bureau is, the less likely it is to die" and "the best time to 'kill' a bureau is as soon as possible after it comes into existence" (Downs 1967, p. 20). In addition, older bureaus usually serve a broader scope of social functions. This is because bureaus acquire additional functions to protect themselves as their original social functions decline in importance. But they still perform the older functions: "As time passes, bureaus, like private firms, tend to diversity to protect themselves from fluctuations in demand" (Downs 1967, p. 20).

Recall that Glaeser observed a tendency for regulatory agencies in his last evolutionary "epoch" to combine regulation and policymaking in several previously separately treated, but related, areas. Thus the Interstate Commerce Commission (ICC) brought in competing transportation means and was to develop a National Transportation Policy; the Federal Power Commission (FPC) added transmission lines, gas, and some securities regulation to electric power regulation. Farris and Sampson noted regional expansion and increased cooperation among utilities in their later stages. Shepherd noted a tendency for later regulation to bring under control competing new forms, though on terms favorable to the already regulated industry. All of these observations may be to some extent consistent with Downs's comment regarding diversification of functions served by the bureau. Shepherd and others may argue that diversification of regulation is evidence of industry protection at work, but we can offer a perhaps equally convincing hypothesis: diversification is evidence of a regulatory agency protecting itself, i.e., bureau protection at work. In addition to industry, consumer, and public interest protection theories of regulatory origin (Posner 1974), it is possible to offer a bureaucratic theory of regulatory origin (see Mitnick, forthcoming 1979). The capacity of the regulatory agency to control its environment may facilitate such protective strategies as diversification in coverage (see Mitnick 1978d).

Downs argues that bureaus die when their social functions are not important enough to draw sufficient resources. This may occur because the basic functions decline in importance, the bureau performs them inefficiently, or some other bureau performs them better. But established bureaus are unlikely to die: (1) bureaus will alter their functions to survive; (2) clients, who often don't pay the costs of bureau services, pressure for their continuance past the point at which the services are justifiable; (3) some clients of the bureau obtain such large and irreplaceable net benefits even when others do not that they continue to press for the service; (4) the absence of the quid pro quo exchange of the market hides situations in which maintenance of the service is unjustifiable and permits the self-interest of bureau members to operate to keep it alive; (5) bureaus are more reluctant to engage in conflict with other bureaus than firms are with other firms because the competition would not be impersonal (the opponent would be more obvious) and such competition is not needed for survival, and because bureaus in conflict would attract the investigatory attention of the central allocation agencies (e.g., legislature and budget office) and public criticism by the bureau's opponents; (6) the large size of bureaus enables them to survive fluctuations in resources; and (7) even if a bureau cannot attract enough external support to go it alone, it might survive by getting another expanding bureau to absorb it (Downs 1967, pp. 22-23).

Downs and the Life Cycle: Concluding Comments

Compared to the life cycle/evolution models described earlier, Downs's is better developed and, with the possible exception of Shepherd, more explicitly explanatory in approach. But though his explanations are superficially deductive and logically developed, they are not very well organized. He does not identify or label stages in the cycles (there may be none - there is no reason to suppose that life cycles are linear progressions), but even when he asserts there are a certain number of stages, he does not bother to specify them. His presentation is more a logical linking of intriguing insights, than a model with a

clearly defined overall structure. One can extract some structure, or use the basic arguments to develop a model, but it is easy to develop special cases and exceptions. Downs's model requires a more careful specification of the conditions under which it will be operative, including the impact of organizational structures on the incentive system, as in the case of the commission form. Though Downs tries to be deductive, he clearly assumes certain features of the agency and its environment that are not made explicit. As a result, generalization may be perilous.

Still, one must admire the sheer density of the analysis, including the number of insights, reasons, and small explanations distinguished, as well as the promise of an approach like the one he takes if developed more carefully.

LIFE CYCLES AND EVOLUTION: CONCLUSION

Assessment of the Models

In Chart 3 we summarize some criticisms that apply to all of the life cycle models.

Perhaps the most important caution that can be made about the foregoing discussion of evolutionary patterns and life cycles in regulatory bodies and those they regulate is that it is based largely on anecdotal evidence, casual observations, and apparent patterns in a few agencies or industries. Shepherd probably goes farther than any of the others in trying to attach his analysis to events in a broad range of the subjects studied (see his chart relating utilities to approximate dates of passage through his stages; Wilcox and Shepherd 1975, p. 349). But far more in the way of empirical verification is needed.[10] Life cycle or evolutionary stages analysis may turn out to have more heuristic than explanatory or predictive value.

Chart 3: General Criticisms of Existing Life Cycle Models

- Lack of rigorous empirical support.
- Poor specification in models in general.
- Relatively unitary treatment of organizations.
- Questions regarding correctness of life cycle metaphor, regularity of stage emergence, existence of stages, cyclical nature vs. evolutionary nature of flow.
- Lack of careful consideration of intra-stage evolution.
- Vague specification of stage boundaries.
- Lack of careful specification of explanatory developmental processes; frequent emphasis on description over explanation.
- Failure to perceive components of regulatory system as open, adaptive subsystems in an interdependent system.
- Failure to explicate processes of external access or influence in system, as well as developmental patterns for other components of the system, such as interest groups.
- Failure to comprehend vast variation and complexity in units of analysis and system.

Most models are, in addition, poorly or vaguely stated and organized, and are imprecise or ambiguous about stage and developmental characteristics.

Many aspects of the life cycle that would aid explanation of agency and utility behavior have yet to be addressed. Some of the authors, of course, such as Glaeser, put far more emphasis on description of the phases than on explanation of why they occur in the form they do and how they originate and evolve into later stages. There is a general need to incorporate organizational variables, and variation, in a more complete and systematic way. The question of whether organizational development in utilities and in agencies is evolutionary or truly cyclical and repeating, and the consequences of the answer, need closer attention.

Models tend to treat all organizations as either unitary bodies, black boxes that behave as single persons might, or as bodies in which one or a very few rational types of individuals determine the organization's course. But organizational action may be a resultant of the behavior of individuals in a collectivity, none of whom has complete control over organizational outputs (or goal-setting). The problematic nature of organizational goals has long been recognized (Georgiou 1973). In the political science literature, the utility of recognizing alternative levels of analysis in organizational settings has also received recognition (Allison 1971).

The life cycle metaphor itself may be misleading. Organizational careers may not be like lives that begin at birth and pass through discernible stages. Organizations may start (and stay mostly at) one stage, whether it is "old age" or "youth." Organizations may not cycle; they may evolve one-way. And there is no reason to suppose that the evolutionary process can be conceptually decomposed into a series of stages; a seamless evolution may be a more appropriate depiction. If organizations do evolve into new statuses that may be considered stages, they must also evolve within stages. The nature of the changes within stages, and the boundaries that separate stages,

are not made clear. In general, life cycle models, though purporting to describe organizational dynamics, are remarkably static. They provide pictures of subsequent stages, describe some processes or behavior or interdependencies that seem to lead to changes, but rarely provide clear statements of carefully explicated and linked developmental processes that explain the evolution or life cycle.

Except for Shepherd's analysis (and even in his discussion the detailed changes in the regulatory body are not explicated), the evolution/life cycle theories do not treat the units of study as comprising a system. The stages through which regulators pass are probably intimately related to the stages of the regulated party. In addition, if the other elements in the regulatory environment (e.g., interest groups) pass through characteristic stages (or are encouraged or induced to pass through some series of stages due to the interaction of the central units of interest), it would in general be necessary for full understanding to include them. Similarly, patterns or processes of external access or influence that characterize this interactive system are not well described. Any unit in the overall regulatory system may be treated as an open, adaptive system (Fiorino and Metlay 1977).

Implicit in some of the stages we have discussed, for example, is a possible life cycle pattern for public interest groups. Thus Bernstein notes the initial activism of such groups in response to the crisis conditions that lead to founding of the commission. This activism fades after the agency's formation, but is revived as the agency in Old Age fails to respond to a renewed crisis. An analysis of the dynamics of the growth and decline of interest groups could have important consequences for the explanation of regulatory life cycles, especially if, as Sabatier (1975) argues, constituency activism may help prevent agency capture.[11]

Finally, both industries (and other regulatory subjects) and agencies exhibit vast variation in all of the aspects sought to be described, explained, or included in life cycle models. Organizational

and systemic structures, personnel, regulatory controls, environmental political, social, and economic conditions, and so on, present a vast array of contingencies that are subject to condensation and simplification (or, simply, lack of consideration) in existing life cycle formulations. Such complexity has led at least one writer to dismiss the feasibility of developing a theory of regulation as almost a logical impossibility (Wilson 1976, p. 702).

Variation and complexity are problems in the study of almost any social setting. Given the foregoing criticisms, however, the utility of life cycle analysis beyond heuristic value remains to be demonstrated.

Future Theory Development

Life cycle theories are somehow intuitively appealing ways to represent observed change in the careers of regulatory organizations. They could perhaps aid us in understanding trends in regulatory behavior. Their present status as satisfactory descriptive or explanatory mechanisms, however, is questionable. There is clearly a need to specify the models more carefully, to include or deal with internal and external (and time dependent) complexity, to subject new as well as developed models to empirical test, and so on.

Of key importance to the development of a better understanding of change processes and patterns in the regulatory system is further work on what could be called the bureaucratic or bureaucratic protection theory of regulation. Public organizations are not passive and/or defensive responders to client-manipulated incentives or disincentives. And they are not merely collections of individuals with different goal sets who respond rationally to the available distribution of goal satisfactions. Regulatory organizations possess, almost by definition, unusual powers to regulate and control their environments. They are characterized by different structures (e.g., commission vs. bureau form) and different technologies of regulating (e.g., routine vs. complex).

They are adaptive in that they can both affect and be affected by environmental change. Different structures, technologies, and environments can, of course, be understood as contingencies affecting extant incentive systems. But the temptation to reduce all explanations of regulatory behavior to simple rational choice calculations involving individuals should be resisted.

A related problem arises in any collective decision making in which the aggregated choice of many individuals must be ascribed to a single, rationalized point of view, or in which an explanation is sought by deducing single or consistent reasons or motives from collective actions. Examples include multi-member courts (where the problem is solved by permitting reporting of differing concurring opinions) and university promotion and tenure review committees (where reporting of reasons to the candidate may simply be discouraged).

Having made the argument for sensitivity to organizational complexity, we do note that simplified but satisfactory explanations for general purposes can sometimes be constructed. At a fairly abstract level of explanation it would not be inaccurate, for example, to speak of a "bureaucratic behavior theory" of regulation in contrast to "industry protection" or "consumer protection" theories among possible alternative theories. Explanations falling under the bureaucratic theory would derive importantly from the goals of bureaucrats and indicated rational behaviors given extant structures, technologies, and environmental contingencies. Resultant collective behaviors would still be included even if intended by no individual. Industry protection and consumer protection theories, in contrast, would explain regulatory behavior largely in terms of actions by industries or consumer groups following their goals in the given regulatory area. Any complex resultant collective behaviors could also be included.

At any rate, adequate models or explanations of general regulatory behavior as well as evolution or life cycles probably awaits study of the components of the regulatory system as the organizations that they are.

IDENTIFYING TRENDS AND PLANNING REGULATION: A FRAMEWORK FOR ANALYSIS OF REGULATORY POSSIBILITIES

A major purpose behind a goal of identifying and assessing trends in regulation is to permit agencies to anticipate change and/or to select and design effective regulatory instruments. Thus trend analysis may be seen as an aspect of the general problem of planning regulation. In this section, we shall develop a framework that can serve as a kind of map or "checklist" of the regulatory process and its environment. This framework can facilitate the identification and categorization of trends in each of several component areas. Hopefully, such a framework could lay the foundation for a capability to design rationalized and workable regulatory means.

Indeed, a major challenge to planning at all levels of government is the need to manage the forms and impacts of the recent growth in public regulation. Regulatory expansion has been characterized by a multiplication of noncoordinated, narrow mission-oriented regulation at all levels of government (Lilley and Miller 1977; Weidenbaum 1977). The costs of regulation have been estimated as quite considerable, with little governmental recognition of the magnitude and distribution of these costs (DeFina 1977; Weidenbaum 1978). Regulatory missions often conflict with one another and with other public services both in formal aims and in actual practices and impacts (Burby 1971; Kohlmeier 1969).

The range of responses to the conditions described above has ranged from defense of the need for regulation in particular areas to a generalized call for regulatory reform in a variety of areas (e.g., U.S. Senate, Committee on Governmental Affairs 1977-78), to arguments for wide-scale deregulation (e.g., Stigler 1975). But both reform and deregulation require prescriptive knowledge bases. Reform requires the ability to match given regulatory means and impacts with policy goals, and both reform and deregulation require the ability to measure and manage transitions to the new states.

Theoretical knowledge for reform design and transition management is, unfortunately, lacking. Past efforts (Bernstein 1972) have been characterized by largely ad hoc prescriptions for removing specific abuses. They have been unguided by systematic knowledge of regulatory design and impacts. It is only recently that the basic regulatory methods and organizational structures have begun being subjected to systematic comparative analysis (Mitnick 1977 and forthcoming 1979; Buchanan and Tullock 1975; Samuels and Schmid 1976; Vladeck 1975). A framework like that we present can facilitate such systematic analysis of regulatory means.

Although the recent literature seems to treat it as so, regulation is not a solely federal issue. Planning for regulation and its impacts is of course necessary both at and across all levels of government. Regulatory burdens (and, occasionally, support for administrative costs) is regularly shifted across or shared across levels; federal direction and support for state strip mining regulation under the Surface Mining Control and Reclamation Act of 1977 is a case in point. In some regulatory areas, there does exist a literature detailing the functioning and impacts of lower-level regulatory legislation and administering bodies. Taxi regulation, which displays some of the classic dysfunctions identified in criticism of regulation from the perspective of economic analysis, is a notable example (Eckert 1973; Kitch, Isaacson, and Kasper 1971). But such instances are exceptions.

The need for knowledge in regulatory planning extends beyond measuring and remedying regulatory performance at all levels of government. Regulatory impacts have both direct and indirect or "ripple" effects on other public services. For example, patterns of regulation of municipal transportation which have prohibited jitneys, limited the extent and raised the cost of taxi service, and preserved or extended the life of linear public transportation systems like trolleys and buses, may have had major impacts on community development and residence patterns (Eckert and Hilton 1972). Thus regulatory interactions with and impacts on other public services must be considered, as well as nonregulatory goals of public action.

The framework presented in this section therefore aims at facilitating design and impact assessment in regulation. It is divided into consideration of regulatory type, regulatory choice criteria, type of regulatory instrument or means selected, and analysis of the activity to be regulated, the regulating activity, and their environments.

Regulatory Definition and Type

Central to the problem of designing and assessing regulation are the questions of regulatory identification and basic classification. These are not trivial concerns; "regulation" is defined in the literature relatively rarely and usually inconsistently (Mitnick 1978b and forthcoming 1979). And many behaviors with an essentially regulatory character (and which could therefore be subject to analysis using evolving approaches in areas traditionally considered "regulatory") have not been recognized as such (e.g., government self-regulation, Wilson and Rachal 1977).

Definitions of "regulation" have treated the term in the differing senses of: guided direction, regularization, dynamic correction, symbolic busywork, coercion, political process, and resultant of regulator and regulatee acting within and constrained by a particular environment (for citations, see Mitnick 1978b and forthcoming 1979). Regulation in practice, of course, can be prohibitive policing, mediating, filtering or buffering, or promoting; the common image of regulation as constraint can be misleading.

It is perhaps most general and most useful, however, to view regulation as an interference of some sort in the activity subject to regulation (Mitnick 1978b and forthcoming 1979). What otherwise would occur is diverted, blocked off, restricted, or altered in the alternatives it presents for choice. But the activity subject to regulation is not replaced or directly performed by the regulator itself; the regulator retains an external or third party status. Since the interferences of

regulation are formally intentional or purposeful in character, regulation may be defined as the intentional restriction of a subject's choice of activity, by an entity not directly party to or involved in that activity.

This very broad and inclusive definition can be narrowed further by specifying the character of the restriction (policing), the nature of the intention (a rule prescribed in the public interest), and the nature of the regulator and regulatee (public administrators, and private parties, usually either individuals or firms).

By narrowing the broad definition in this way, we are really defining only one type of regulation, that in which public regulates private. But the scope of regulation is much wider. Four possibilities of regulation among public and private parties are depicted in figure 2 (on this, see Mitnick 1978a).

"Traditional" regulation (category I), the independent regulatory commissions, involves controls directed by a public regulator on the private sector. Criticism of regulatory performance has often included the observation that, in practice, the direction of interference or control is opposite (category II); regulatory outputs tend to correspond to the interests of the regulated party rather than those specified in the formal regulatory authorization, e.g., legislation. Thus such "capture" could be understood as a kind of reverse regulation.

Public agencies often regulate other public agencies (category III), such as when they monitor affirmative action compliance or performance under grant programs. Here the (admittedly sometimes problematic) distinction between definitional "regulation" and direct programmatic authority or control must be observed. Wilson and Rachal (1977) have recently commented on the problems attending what we have called "government self-regulation" (Mitnick 1978a).

Finally, "private self-regulation" (category IV), which would seem to be a paradoxically titled form given traditional areas of focus, is

		Regulatee	
		Public Regulatee	Private Regulatee
Regulator	Public Regulator	Government Self-Regulation III	Traditional Regulation I
	Private Regulator	"Capture" II	Private Self-Regulation IV

Figure 2: Typology of Regulation

actually extremely common. Private as well as public legal systems exist (Evan 1976) and private agreements in such areas as product specification standardization (e.g., stereophonic recordings and equipment) can be viewed as regulatory in character.

These categories can be further subdivided. In addition to distinctions based on the nature of the actor and direction of control, regulation can be characterized by the objects of regulation and the levels of analysis at which regulatory controls are directed.

In figure 3 regulatory types are identified by level of analysis (intra- versus inter-organizationl) and by activities or behaviors at which regulatory interferences are directed. These interferences then involve control of individual behavior or of activities with direct impacts on people (e.g., "social" regulation such as safety standards and EEO) versus control of instrumental market activities (e.g., "economic" regulation such as entry or price controls). Under the intra-organizational level we include controls directed at individual organizations rather than at relations between organizations or the overall structure of an inter-organizational set or industry. Figure 3 also offers one or two examples of the controls or regulated areas in each category.[12]

The consequences for regulatory policy design follow directly. Given the basic definition of regulation, one can ask, is and should any public action in the subject area be regulatory? If the action is to be regulatory, through which basic regulatory type should it be implemented? Furthermore, at what activities and at what levels should the regulatory interferences be directed?

To inform choices of this character, a better understanding of the advantages and disadvantages of each of the regulatory types in various settings is needed. When, for example, is "traditional" regulation preferable to industry self-regulation? Under what conditions (if any) is it societally desirable to promote (and thereby regulate)

Activities or Objects	Level of Analysis: Intra-Organizational	Level of Analysis: Inter-Organizational
"Social": Activities with direct impacts on people	OSHA EEO	Income redistribution
"Economic": Instrumental market activities	Production process controls Management audits Rate regulation	Anti-trust Entry controls Some macro-economic policies

Figure 3: Typology of Regulatory Object Areas

industry indirectly through permitting "capture"? Regulation of what kinds of activities, and at what levels of analysis, are likely to be more or less successful? "Economic" regulation, for example, especially that which is directed (in effect) at controlling or reducing the uncertainty in firm environments, has generally come to be supported by the regulated firm (possibly as in category II in figure 2). "Social" regulation at the intra-organizational level, concerned largely with non-production-oriented interferences with individual behavior, has been opposed (possibly as in category I in figure 2). Such "social" regulation can constitute a challenge to the jealously guarded prerogatives of organization managers.

Decisions on basic regulatory design alternatives should, of course, rest on specified and well-developed choice criteria. Thus a major part of any framework for regulatory design and assessment should be such a set of rationalized criteria. This is not to say, of course, that design decisions are usually made this way. Usually only a restricted set of criteria (if any) are used, and reliance is usually placed on traditional or customary regulatory means (e.g., standards) without much analysis of significantly different alternatives. The criteria that are customarily relied on can, of course, change over time, and we should therefore be prepared to plot trends in such change.

Regulatory Choice Criteria

The variety of possible regulatory choice criteria is of course enormous. Rather than offering a list of common criteria, we will, first, briefly discuss the ultimate common justification for public action (the public interest) and some of its common regulatory variants, and, then, present several categories within which choice criteria may be expected to fall.

The "public interest" is, of course, a concept that has taken on a large and diverse set of meanings. Some critics argue that the concept has become so inclusive as to become equivalent to "whatever the

government does." General standards used in regulation include: "just and reasonable rates, undue preference or prejudice, public convenience and necessity, discrimination, discouraging membership in a labor organization, bargaining in good faith, unfair methods of competition. . ." and so on (Friendly 1962, p. 8). Because phrases such as these are so vague, they can be used to support conflicting actions or to justify virtually any expedient action (see, e.g., Bonbright 1961, pp. 27-28; Mitnick, forthcoming 1979).

It is possible, however, to systematically classify conceptions of the public interest, although the dimensions used in classification may be fairly abstract. Public interest conceptions can be categorized according to the number of sets of preferences (e.g., number of diverse views of public action) required to be considered and the state of agreement among them; the requirement of the existence of a holder of the public interest conception; the level of the holder (ideational, individual/group/organizational, systemic); whether participation (e.g., voting) is required of the holder or if determination of the public interest is purely passive or investigatory in character; and whether the determination is rule vs. non-rule governed (see Mitnick 1976).

Although useful in categorizing broad conceptions of the public interest, such an abstract classification may not permit identification of criteria that can be used directly to evaluate and choose among alternative regulatory means. At any rate, basic public interest conceptions are usually specified or taken for granted as implicit in the governmental decision-making structure (e.g., the democratic participatory values formally inherent in a representative system). Thus we need a set of intermediate, substantive, contextual goals.

Useful intermediate goals should (1) relate to aspects of both the regulated activity, e.g., impacts of trade practices, and the regulating activity, e.g., aspects of procedures of the regulatory agency. This

distinction is rarely made, but can be crucial in evaluating forms of public action; reliance on traditional regulatory means often conceals implicit decisions on goals. The goals can, furthermore, (2) relate both to the activity by itself, and the activity with its environment (i.e., relating to its impacts). Finally, goals can (3) relate to particular aspects of the activities (whether regulated or regulating). These can be divided into the quality of activity performance; existence, maintenance, and support of the activity; and evolution and development of the activity. These distinctions, together with some examples, are depicted in figure 4 (see Mitnick, forthcoming 1979).

Planning in regulation can then involve a systematic survey and choice among these intermediate goals. At any rate, the typology can sensitize planners to the variety of potential (and possibly implicit) regulatory goals.

Having examined the goal set, we turn to consideration of the basic means to be selected by these goals.

Type of Regulatory Means

Two very general kinds of regulatory interference that can be directed at both regulating and regulated activities are "incentive" and "directive" mechanisms. These can be contrasted for their relative advantages in regulatory interference in both kinds of activities. We shall take the view that regulatory means should be seen as manipulable and adaptable to situational constraints, given choice of evaluative criteria. New regulation will not be seen as necessarily involving merely incremental adjustments in or reorganizations of existing, traditional regulatory approaches.

"Directives" may be understood as instructions for behavior that circumscribe individual choice of activity. Usually, either explicit or implicit in the instruction will be the threat of negative "incentives" such as coercion or the withdrawal of presently received or promised rewards.

Aspects of Activity	Regulating Activity		Regulated Activity	
	Activity by Itself	Activity with Environment (Impacts)	Activity by Itself	Activity with Environment (Impacts)
Quality of Performance	efficiency in regulating procedures	equity in dealing with public	efficiency in regulated industry	safety, equity in regulated industry
Activity Existence, Maintenance, Support	reliability in regulatory procedures	impacts of regulatory stability on regulated industry	stability, reliability in regulated industry	impacts of activity reliability on suppliers of industry
Activity Evolution and Development	innovation in regulatory procedures	impacts of regulatory innovation on other agencies	innovation, growth in regulated industry	impacts of activity innovation or growth on community

Figure 4: Typology of Intermediate Goals

"Incentives" are transmitted in relations in which a positive reward (or reduction in a negative reward) is linked to particular choices of individual activity. Unlike directives, the subject individual is not instructed, or directed, to perform the given activity; he retains some discretion or choice regarding performance. (On the definition of "incentive," see Mitnick, Backoff, and Rainey 1977; Mitnick, forthcoming 1979).

Directive means include traditional administrative rules, standards, prohibition, and so on; incentive means include auctions or permit markets, tax incentives, effluent charges, and subsidies.

There is no clear pattern of superiority in selection of one general means over another; the literature, while burgeoning, has not yet definitively established the conditions under which each means would be indicated. The literature can provide, however, some indications of conditions favorable and unfavorable to adoption of a particular means. At present, ad hoc or experimental trade-offs must be made among these indications, subject to contextual factors.

Incentives, for example, appear superior in terms of such factors as promotion of innovation, flexibility in application, cost of administration, and enforcement costs. Directives appear superior in such areas as initial information cost (incentives can require information on the particular preferences and behavioral responses to which they are directed; directives can rely on the more certain impacts of threats of coercion), effectiveness in crisis (less of a lag in response), and predictability and coordination. Individual circumstances can then permit and determine tradeoffs among conditions or tendencies such as these. These arguments can, and have been, made specific, of course, to particular incentive and directive means (see Mitnick 1977, 1978c, and forthcoming 1979).

Note that adoption of a general design perspective like that offered here can lead to selection of non-traditional means (e.g., auctions or

permit markets instead of standards). It can at least assure the planner that, given current knowledge constraints, and the constraints of the particular situation, the "best" alternative has been selected. Shifts in the conditions of the particular situation could also find the planner better able to adapt or switch regulatory means. As we saw earlier in our consideration of basic regulatory types, regulation can be more varied, and offer more possibilities to the planner, than is usually supposed.

Having considered the regulatory goal set and the basic regulatory means, we need to create a systematic representation of the regulating activity, regulated activity, and their environments, including regulatory targets and impacts. These targets and impacts will represent, of course, the set of possibilities for regulatory intervention through the specified means as evaluated by the specified goals.

Regulated Activity, Regulating Activity, and Environment

Planning in regulation involves selection of appropriate general regulatory forms (e.g., "traditional" regulation); objectives of regulatory interference; basic regulatory instruments (incentive or directive); targets of or loci for regulatory interferences, which constitute a subset of the potentially regulated activities (e.g., rates or effluent); and valued characteristics and impacts of the regulating, and regulated, activities, respectively. The "valued characteristics" are intrinsic or constituent aspects of the activity in question that are valued for themselves rather than their external impacts, consistent with our earlier discussion of goals. Obviously, the evaluation of the means and its impacts, together with the regulated activity and its impacts, links selection of the possibilities in each of these areas.

In order to describe these last two areas, targeting and valued characteristics/impacts, we need to systematically examine the activity to be regulated, the regulating activity, and their environments. We will

look, first, at the regulated and at the regulating activities and, second, at the environment in which these activities occur.

Regulated and Regulating Activities

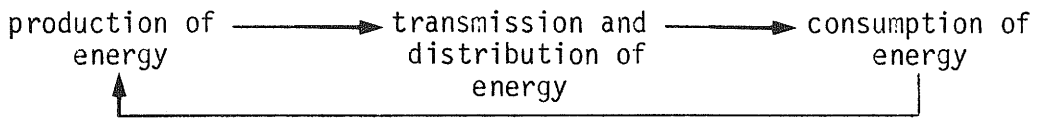
Targets in and Valued Characteristics/Impacts of the Regulated Activity

Targets in and valued characteristics/impacts of the regulated activity may be analyzed by (a) constructing a systems model (and, possibly, subsystems models) of the activity area to be subject to regulation; (b) selecting, by reference to the systems flow, key control or "target" points where regulatory interference is to be exerted; (c) selecting, through use of the systems model, a set of valued characteristics of the activity to be regulated (these characteristics may coincide with the targets); (d) specifying impacts parallel to, or resulting from, intervention at each target point; and (e) aggregating and/or trading-off among values of chosen characteristics and of impacts in the light of the specified choice criteria. The result must be integrated, of course, with that from analysis of the regulating activity and its impacts.

We shall partially illustrate this analytical procedure for the case of regulation of energy production by public utilities. A division into two levels, systemic and subsystemic, is useful here. In more general applications, the systemic level can be chosen to contain a basic sectoral or functional process (e.g., energy production, transmission-distribution, and consumption). The subsystemic level can focus on an important part or stage of the systemic process (e.g., energy production). One could also examine higher or lower level systems, of course (e.g., a societal system of which energy is only a part). A related approach is that taken by Jay Forrester and others in modeling urban and world systems (e.g., Forrester 1971).

A simple system in energy production, transmission-distribution, and consumption is depicted in figure 5, together with sample identifications of regulatory tools and impacts for each stage that is regulated.

SYSTEM:



ANALYSIS (Partial):

Regulated Activity (Stage): Target	Regulatory Tool Set (sample)	Regulatory Impact Set (sample)
Producers	Pollution control standards (directives)	Health benefits, marginal firm bankruptcies
Transmission and Distribution Mechanisms	Curtailment directives	Unemployment, industry shifts
Consumers	Weatherization incentives	Profit in insulation industry

Figure 5: Energy System Regulation Analysis

Note: Besides the target activities themselves, evaluation may include other aspects of the regulated activities. The systems analysis should aid in identifying them. In many cases, it is expected that the set of potential targets will include all regulated activities that are to be included in the evaluation.

Similarly, in figure 6, the subsystem for energy production is depicted and sample regulatory tools and impacts are listed for target areas under each component of the subsystem. If the subsystem structure is identified carefully it should be possible to locate all target points for control (and, to the extent that knowledge permits, likely resulting impacts) of energy production by public utilities. Rather than face a desultory list of specific used or potential regulatory instruments, the planner can systematically analyze possible control points. Trends in each of these areas can be plotted.

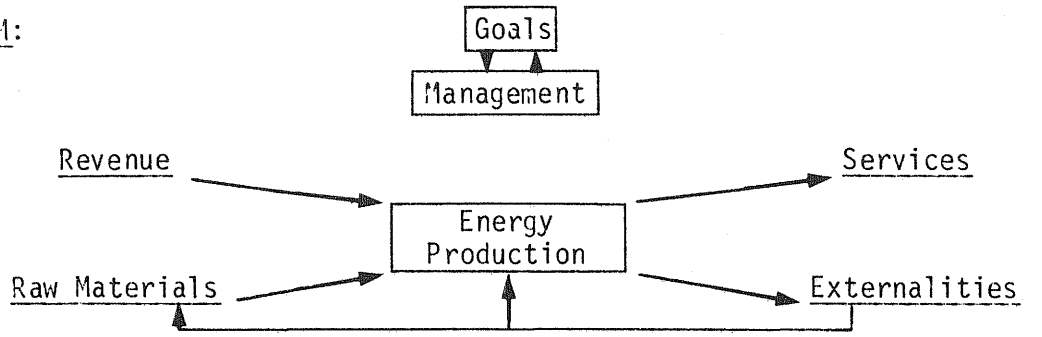
Valued Characteristics/Impacts of the Regulating Activity

No longer concerned with control points or targets, the planner in approaching the regulating activity is concerned with basic design and impact aspects and their evaluation. Assuming the regulation is administered through an organization, i.e., a regulatory agency, two features are prominent: (a) design and impact of the regulatory instrument (e.g., a directive or incentive form), and (b) design and impact of the regulatory organization and its procedures.

We have already considered the range of alternative basic regulatory means; the regulatory advantages and disadvantages of incentive and directive means can be tabulated and applied in particular circumstances. Apart from intended direct effects and impacts of the means in regulation, one can evaluate the means itself and its non-regulatory impacts. One of the advantages of incentive means, for example, can be the free choice permitted subjects of the regulation in responding. This can be given value apart from the control efficacies of incentive means. Furthermore, use of incentive means may have impacts of this character that may be valued. Use of incentive means could contribute, for example, to reinforcement of collectively held societal beliefs in "free enterprise" or individual liberties.

The regulatory organization and its procedures may be analyzed by examining (a) the organizational structure and general operating

SUBSYSTEM:



ANALYSIS (Partial):

Component Regulated Activity: Target	Regulatory Tool Set (sample)	Regulatory Impacts Set (sample)
Inputs:		
Revenue	Rate regulation (directives)	Energy purchase choices by bulk power and by residential consumers (who may differ)
Resources, including raw materials and capital	Fuel adjustment controls; securities regulation (directives)	Fuel use choices, air pollution with health impacts; equity in securities market
Throughputs:		
Production processes	Process controls (directives)	Firm costs; impacts on suppliers
Management	Management audits	Firm efficiency
Goal-Setting	Public utility concept-related directives	Populations served with resulting residential and industrial patterns
Outputs:		
Services	Service mix directives, e.g., "cross-subsidies"	Service usage by favored population segments with health, residential, occupational impacts

Figure 6: Energy Production Subsystem Regulation Analysis

Externalities	Pollution control standards (directives); effluent charges (incentives)	Health benefits, marginal firm bankruptcies, etc.

NOTE: Besides the target activities themselves, evaluation may include other aspects of the regulated activities. The systems analysis should aid in identifying them. In many cases, it is expected that the set of potential targets will include all regulated activities that are to be included in the evaluation. For a related approach to analyzing alternative regulatory intervention loci, cf. Wittman (1977).

Figure 6: Energy Production Subsystem Regulation Analysis

(continued)

procedures, (b) who occupies that structure, and (c) regulatory processes within that structure. Some typically important aspects of these factors are identified in Chart 4.

Any structural, personnel, or regulatory process aspect may be accorded intrinsic value and/or be valued for its impact elsewhere. Innovative regulatory procedures, for example, may have impacts in promoting innovation in other regulatory agencies.

As with the regulated activities, the values placed on the regulating activities and their impacts must be systematically compiled, aggregated, and considered along with the values associated with the regulated activities assessment.

Regulatory Environment

Up to this point our consideration of external impacts from regulated and regulating activities has vaguely referred to a determination parallel to the selection of targets or other activities. In this section, that reference is made more explicit. Clearly it may be helpful to systematic analysis of impacts, particularly for tracing impacts outside the immediate regulatory system, to provide a framework for surveying the regulatory environment. In figures 7 and 8 such a framework, admittedly at a fairly abstract level, is depicted. The model in figure 7 is presented in the context of energy production regulation. Tracing the impacts of regulatory interventions is a difficult task; there is both a simple information problem and a gap in theoretical knowledge about the interdependencies in the regulatory systemic environment. The framework presented is meant merely as a survey tool and would not of course resolve these basic problems.

The impact analysis would proceed in the following manner: (a) employ the system and subsystem models of the regulated activities to identify points of interaction or interface with the environment.

Chart 4: Regulatory Organizational Analysis

A. Structure and General Operating Procedures

1. Structure: size, number of levels, hierarchy shape, form (single-headed bureau vs. commission)

2. Communication and Decision-Making Procedures: communication flows/patterns and media, fragmentation of decision-making (use of the "institutional decision" (see, e.g., Davis 1972)

3. Formalization: extensiveness and formalization of internal operating regulations

4. Technology Utilization: specialization and distribution of specialization within the organization, complexity of technology used in organizational tasks

5. External Structural Relations/Dependencies: organizational interdependence vs. status as unit internal to larger agency

B. Personnel

1. Type: Civil Service/appointed/elected; distribution of type through organization (top/middle/bottom; line vs. staff)

2. Formalization of personnel system: constraints on reward manipulation by supervisors and on hiring and termination

3. Professionalization: level of expertise/professional training, orientation towards organization vs. orientation towards profession

4. Mobility Pattern: appointed/hired from where, tenure in position, leave to go where

C. Regulatory Processes

1. Dispute initiation and settlement aspects

   a. Gatekeeping procedures and criteria: criteria for "standing" (admission), public participation outreach mechanisms

   b. Regulatory dispute processing: procedural and decisional criteria (due process and criteria specified in legislation and agency regulation), public participation mechanisms in case processing, public representation mechanisms (including public and other special counsels), dispute processing procedures themselves (e.g., hearings, appeal mechanisms)

Chart 4: Regulatory Organizational Analysis
(continued)

2. Ongoing administrative regulatory activities

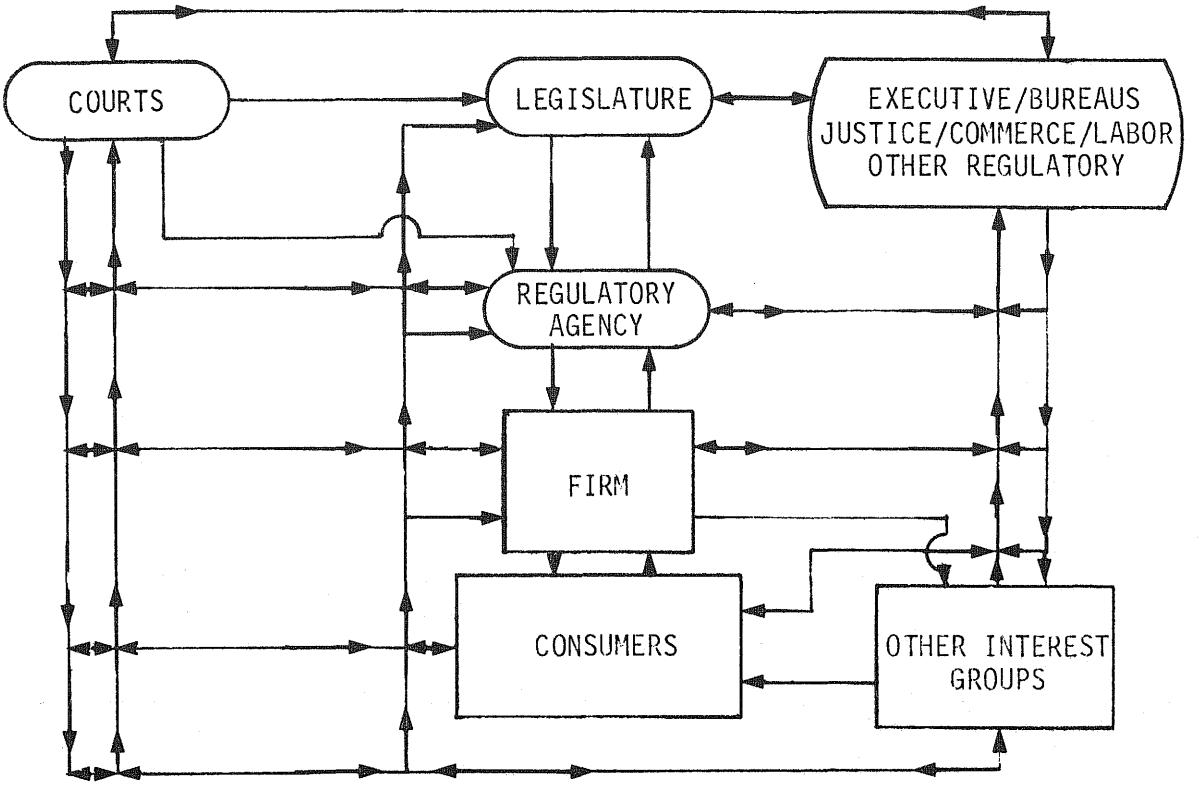
   a. Rule promulgation and interpretation, and resulting dispute settlement

   b. Administrative determinations and oversight of regulatory instrument functioning

   c. Investigatory, monitoring, and enforcement procedures

Points of Environmental Interaction or Interface	Impacts of Regulation on
Inputs:	
Revenue	Customers (including both bulk power and residential energy purchasers); competitors in production
Resources, including raw materials and capital	Suppliers of fuel; suppliers of capital (lenders, stockholders); competitors for resources
Throughputs:	
Production processes	Competitors in production using same technology; suppliers of resources
Management	Competitors in production
Goal-Setting	Customers; local community
Outputs:	
Services	Customers; local community
Externalities	Local community; competitors in production

Figure 7: Framework for Environmental Impacts Analysis: Regulated Activity Impacts



Note: The model depicted above is for a single governmental level. In general, inter-governmental relations of, for example, a state public utility commission would include:

a) Federal
   - FERC and other units in Department of Energy
   - Other federal agencies

b) State
   - Executive
     - governor's office
     - attorney general/consumer's counsel, public advocate
     - other regulatory agencies, e.g., power plant siting
   - Legislature
     - oversight
     - appropriations
     - constituency service

c) Local
   - e.g., local public utility regulation and public enterprises such as municipal power plants

d) Courts
   - Federal/State/Local

Figure 8: Framework for Environmental Impacts Analysis: The Regulatory System

These constitute loci of potential direct environmental impact and can suggest indirect loci. (b) Similarly, construct a model of the system in which the regulating activities are embedded. This is essentially a flowchart indicating interactions, including exchanges, one-way flows, and influence relations, among the components of the regulatory agency's environment; a sample model for a single governmental level is depicted in figure 8 (Mitnick, forthcoming 1979). Impacts, both direct and indirect, may then be traced through the interaction processes shown.

Among the relationships displayed in figure 8 are the following: Legislatures typically create regulatory agencies through delegation. The agency may regulate some industry, whose activities impact some group of consumers as well as, perhaps, other groups interested in the effects of the industry's production. The activities of the regulated industry may be protested and/or affected in various ways by the relevant consumer and other interest groups, who, along with the industry, may also suggest or request actions by the agency, as well as suggest changes in (including creation of) the regulatory mandate to the legislature. Agency actions may also be appealed in the courts (and court decisions appealed by the agency and the participant interest groups to higher courts), who may direct the agency to alter its behavior, and may interpret and even disallow aspects of the legislature's mandate to the agency. The agency may request changes in its mandate or support level from the legislature. Actions by other administrative units may also be included in the system. These may consist, for example, of requests to the legislature for changes in or creation of a regulatory mandate or structure, appointments of officials in the regulatory agency by the agency's administrative sovereign (see Downs 1967, Chapter 5) as well as requests to the agency for regulatory actions, activities (including other regulation) that affect the industry and interest groups, and prosecutions and appeals of actions in the courts. (This description is from Mitnick, forthcoming 1979. For a similar model, see Krasnow and Longley 1978, p. 97).

The complexity of this system suggests that impacts can be indirect and therefore potentially escape association with the original regulation. Furthermore, the impacts of regulation can feed back to the agency. Although the task of tracing impacts is not made trivial by a model like this, something of the sort is probably necessary as a first step.

Note that construction of a flowchart of the internal regulatory process could aid in the analysis of regulatory organization discussed earlier. We have, however, employed the systems flowchart model largely as a logical accounting exercise to force identification by the planner of the full set of control points or targets and interaction/interface loci for impact analysis. Understanding (and evaluation) of internal system processes could obviously also be aided.

CONCLUSION AND LIMITATIONS OF THE APPROACH

The planning framework presented in this section is meant to help identify trends in regulation and to facilitate choice and design of regulation. It may be understood as an approach to developing a set of systematic checklists so that planners can undertake more holistic and complete analyses of a complex and difficult problem in public action. The problematic history of regulation suggests that any design aids should encourage broader, more systematic analysis and the consideration of non-traditional approaches. The likely end result from systematic analysis called for here would be development of understanding of a portfolio of regulatory tools for use under diverse circumstances.

The overall framework presented in this section consists of a set of typological frameworks linked by the logic of systems analysis: identify the general approach and problem area, specify the objective function, consider alternative solution strategies, including action instruments and loci for intervention. Choice then involves evaluation of the impacts of the alternative strategies in terms of the choice criteria inherent in the objective function.

We have thus considered the definition of "regulation" and major alternative forms of regulation; identified the basic choice criterion (the public interest) and an intermediate goal set that may be employed to evaluate regulatory means and their impacts; contrasted alternative basic regulatory means (incentives vs. directives); and developed models for analysis of regulatory targets and the nature and impacts of regulating and regulated activities.

Thus, the approaches presented in this section must be understood as facilitative and suggestive for systematic regulatory analysis and design, but not as determinative. We do expect that they may be directly useful in pursuit of the more limited objectives of identifying, classifying and tracing trends in regulation.

FOOTNOTES

1. The sections on evolution of utilities, agency life cycles, and rigidity draw on materials from Mitnick (forthcoming 1979). Citations to this material should refer to that work as the primary source. Permission to quote, after reference to Mitnick (forthcoming 1979), should be directed to the author and to Columbia University Press.

2. See, e.g., Stigler (1971). But not all argument of this position is recent; see Gray (1940).

3. See, e.g., Shepherd (1975). A frequently cited distortion is the "A-J-W" effect. If the rate of return on investment allowed by the regulatory agency is greater than the cost of capital, total profit may be increased through overinvestment in capital. Thus the firm may select a technology which is relatively capital-intensive and/or attempt to expand its output. For a discussion of possible consequences of the effect, see Kahn (1971, Volume 2, pp. 49-59, 106-108). For recent empirical support of the effect, see Spann (1974), Courville (1974), Petersen (1975), and Hayashi and Trapani (1976), cf. Boyes (1976).

4. On technological change and innovation in regulated firms see, e.g., Capron (1971), Noll (1971, pp. 23-27).

5. The agency may preserve itself through being relatively better able as a regulatory agency to control its environment (see Mitnick 1978). This argument is somewhat consistent with Shepherd.

6. See footnotes 3, 4 above.

7. See, e.g., Meier and Plumlee's (1977) reconstruction of Bernstein's model, which appears to differ from Bernstein's actual discussion in Bernstein (1955).

8. A better way to view this is perhaps to divide bureaucrat goals into those that require a goal "holder" (individual, organization, society) and those that do not (ideation).

9. The regulators could also, of course, think they are vigorously performing regulation in the consumer or public interest while actually serving the regulated industry's interest.

10. For one attempt, see Meier and Plumlee (1977 and 1978).

11. For models that may be adapted to this purpose see, e.g., Schwartz (1976), pp. 193-198, on the "life of protest organizations" and Mitnick (1974), pp. 398-402, on the evolution of advocacy in interest groups.

12. The author wishes to thank Alfred Marcus for remarks helpful in constructing the typology of figure 3.

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PART IV
STATE LEGISLATIVE TRENDS[1]

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Part IV: Table of Contents (continued)

NEW STATE LEGISLATION: INTRODUCTION

State utility regulation has undergone significant change during the 1970s. Many of these changes have been reflected in legislation concerning the issues confronting state commissions. These include conservation responses to energy shortages, the welfare implications of energy pricing policies and the plant expansion plans of utility companies. The purpose of this study is to examine state legislative activities concerning utility and energy regulation between 1973 and the present to determine what the states' response to recent problems have been.

Administrative practices and judicial proceedings are equally good indicators of the regulatory policies, however they often refer to specific situations and a longer time must pass before a general trend emerges. Legislation provides a more timely indication of developing trends than do adjudicatory measures because laws appear to have more permanence. Administrative directives are subject to discretionary interpretations and may therefore have different meanings over time. For these reasons it was decided that although adjudicatory and administrative practices are important indicators of regulatory policies, legislative information is easier to obtain and more conclusive in the short run.

The results presented in this study are not all-encompassing, but are nevertheless significant. In undertaking this project, it was quickly learned that there is no single, comprehensive source of

information about legislative enactments. A data base was, therefore, created from a variety of sources and, as far as we are aware, is the first of its kind. The results are also significant because of the amount of legislative activity in the regulatory field since the early 1970s. Not only have we documented the activities of this period, but we have established a base which can later be supplemented by an exploration of prior legislation as well as by the addition of subsequent legislation.

The methodology used in establishing this data base was straightforward. A list of topics covering thirty-nine significant regulatory issues was prepared and all state revised codes and supplements were examined to determine the extent of legislative activities in these areas. For each law the following data were obtained: source (i.e., codified number and volume) of the law, the date of passage, the agency entrusted with jurisdiction, a brief summary of the law, and any provisions of particular interest. The compiled material was checked for accuracy by comparing it with the entries in Energy: The State Response for the years 1975-1977. This was not a perfect check since it neither covered the same period nor the identical subject matter of our investigation, but it was helpful in correcting errors and in finding additional legislation left out of the original set.

In this study an effort is made to systematically classify states' legislative responses to various issues according to geographic location, population and net energy production status. For purposes of this report, the fifty states were divided into nine geographic areas. The states are also divided into four separate population categories to provide an indication of whether the more populous states responded differently to these issues than the relatively less populated states. Finally, the states' legislative responses to regulatory issues are compared on the basis of net energy production status. Those states who produce more energy for export to other states than they import from other states are classified as net energy exporters, while those states for whom the converse is true are categorized as net energy importers.

It is intended that this study can be useful in two main ways. First, it permits an examination of the substances of legislative enactments in several issue areas. Second, in the last section of the study, it compares the responses by different types of states to different regulatory and energy management and conservation issues.

1. ENERGY CONSERVATION

Consumer Programs

The area of consumer activism has been important in the 1970s, not only in the field of energy regulation and conservation, but in every aspect of governmental activity. Government has taken upon itself the task of protecting, at least to some extent, the needs of individuals who would otherwise be relatively powerless in the economic decision-making process. Consumer oriented programs include hearings, advertising, publications, and appliance labeling. In addition, steps have been taken by legislatures to make energy conservation methods more accessible to consumers. In the area of energy a variety of tax relief programs and consumer loans are available for this purpose.

Consumer Education and Protection

Consumer Counsel and Representation

One major expansion of the role of the state in protecting the consumer has been in the development of the consumer counsel. This is a term used to cover different administrative relationships, since the consumer counsel can be the state attorney general, or some other form of special consumer counsel, or as we use it here, even a consumer protection division in a state agency.

During the study period some form of consumer counsel was established by statute in the following states: New Jersey 1974; South Dakota 1974; Arizona 1975; Connecticut 1975; District of Columbia 1975;

Hawaii 1976; Kentucky 1976; Nevada 1976; New Hampshire 1976; Ohio 1976; Pennsylvania 1976; Indiana 1977; Maine 1977; Missouri 1977; Tennessee 1977; Utah 1977; Maryland 1978; Minnesota 1978; and Montana 1978.

The division of states into regions shows the following characteristics:*

Table 1A: Summary of Consumer Counsel and Representation Legislation By Geographic Regions

Region	#	%	States
Mid Atlantic	4	57%	District of Columbia, Maryland, New Jersey, Pennsylvania
New England	3	50%	Connecticut, Maine, New Hampshire
West	3	50%	Arizona, Nevada, Utah
Mid West	3	42%	Indiana, Minnesota, Ohio
Great Plains	2	33%	Montana, South Dakota
South	2	33%	Kentucky, Tennessee
Southwest	1	16%	Missouri
External	1		Hawaii

In terms of population the distribution is:**

Table 1B: Summary of Consumer Counsel and Representation Legislation By State Population

Population	#	%	States
<2 million	8	44%	District of Columbia, Hawaii, Maine, Montana, Nevada, New Hampshire, South Dakota, Utah
2-4	4	26%	Arizona, Connecticut, Kentucky, Minnesota
4-6	4	44%	Indiana, Maryland, Missouri, Tennessee
>6	3	33%	New Jersey, Ohio, Pennsylvania

*Percentages refer to the number of states passing legislation in a given geographic region divided by the total number of states within that region, and numbers refer to the number of states represented within a given geographic region. A listing of states according to geographic region may be found in Appendix B, p. 216.

**Percentages refer to the number of states passing legislation in a given population division divided by the total number of states within that division, and numbers refer to the number of states represented within a given population division.

The energy importing jurisdictions include Arizona, Connecticut, District of Columbia, Hawaii, Indiana, Maine, Maryland, Minnesota, Missouri, Nevada, New Hampshire, New Jersey, Ohio, Pennsylvania, South Dakota, and Tennessee. This group comprises 41% of the states classified as importers. The states of Montana, Kentucky and Utah make up 25% of the states classified as exporters. Importing and exporting as defined here refers to a state's energy trade balance. The District of Columbia is included in the total number of importing states used to calculate percentages.

Consumer representation is carried out in several ways. Some jurisdictions have designated an individual to represent citizens in court on energy related or utility matters. This is the case in the District of Columbia (People's Counsel), Ohio (Citizens Governing Board appoints counsel), Minnesota (Consumer Services Section of Department of Commerce), Pennsylvania (Office of Consumer Advocate in Department of Justice), Connecticut (Office of Consumer Counsel in Office of Governor), Montana (Consumer Counsel), New Jersey (Division of Rate Counsel in Department of the Public Advocate), Missouri (Department of Consumer Affairs Director appoints a public counsel), Pennsylvania (Consumer Advocate), Hawaii (Director of Regulatory Agencies), Maine (Attorney General), and Indiana (Office of Public Counsel in Office of Governor).

In several other jurisdictions, there are investigative boards or groups of consumer advisory agencies. In some cases they have the power to investigate, while in others they are advisory only. Thus, Utah has created a Committee of Consumer Services in the Department of Business Regulation to assess impacts of utility rate changes and act as a lobby before the state public service commission. Maryland has created a Utility Consumer Advisory panel in its Public Service Commission to advise the PSC and undertake studies. Arizona has a citizens energy task force to advise the governor. New Hampshire has a legislative consumer utility council composed of four representatives and four senators. In Nevada there is a Division of Consumer Relations in the Public Service Commission to investigate complaints against utilities.

From this information it appears that many states have recognized the need for a consumer representative in the energy field and have acted accordingly. This is consistent with a national trend in other consumer related matters across the country.

Public Information and Education

Although public information may not have the same immediate and direct impact that the use of a public counsel can have, providing citizens with accurate and adequate information about their energy needs and usage is extremely important. Public information, as defined here, is restricted to data flowing to the citizenry. There are other efforts to provide energy information to agencies and bureaus of the government. These advisory functions will be covered in a subsequent chapter of this report.

During the study period, 11 jurisdictions passed legislation concerning public information and legislation. They include: Montana, 1974, 1977; Illinois 1975; New Mexico 1976; Virginia 1976; Georgia 1977; Minnesota 1977; Nevada 1977; Ohio 1977, 1978; Oregon 1977; Maryland 1978; and New York 1978. Geographically, the states are dispersed as follows:

Table 1C: Summary of Public Information and Education Legislation By Geographic Regions

Region	#	%	States
Midwest	3	42%	Illinois, Minnesota, Ohio
Southeast Coastal	2	40%	Georgia, Virginia
West	2	33%	Nevada, Oregon
Mid Atlantic	2	28%	Maryland, New York
Great Plains	1	16%	Montana
Southwest	1	16%	New Mexico

When ranked according to population, the states are similarly widely dispersed.

Table 1D: Summary of Public Information and Education Legislation by State Population

Population	#	%	States
<2 million	3	16%	Montana, New Mexico, Nevada
2-4	2	13%	Minnesota, Oregon
4-6	4	44%	Georgia, Illinois, Maryland, Virginia
>6	2	22%	New York, Ohio

Twenty-four percent of the net energy producing states are represented while the states of Montana and New Mexico make up only 16% of the net energy producting states.

Most of the state statutes place requirements on some agency of the state government. For example, Maryland requires its Department of Natural Resources to conduct a public education program on oil recycling. Minnesota requires the Director of the Minnesota Energy Agency to prepare pamphlets and radio and television messages on conservation in housing, including tax credits and available grants or loans. Other states have similar requirements.

However, some new legislation requires entities outside the government to provide for consumer representation. Oregon, for example, requires both public utilities and energy-related suppliers other than public utilities to provide energy conservation information to the public. This requirement of public utilities also appears in other states, including Ohio where it is required that energy information be given in Driver's Education classes.

The legislatures of Montana, Oregon and New Mexico have sought to establish some type of information program in the public school system of their respective states. A House Joint Resolution in Montana urges local school districts to implement energy conservation programs that will inform students about the impacts of diminishing nonrenewable energy supplies on our lifestyle.

Other, legislative actions include a New York requirement that room air conditioners have energy labeling and an Oregon requirement that the State Energy Board adopt a recommended voluntary energy efficiency rating system for single family residences.

In many states the major responsibility for public education and information is given to the Public Utilities Commission as part of its overall authority. This may explain why the level of legislative activity in this area appears to be lower than anticipated.

General

Legislation has also been enacted in three less traditional areas: customer billing, advertising and public hearings.

In the area of customer billing, few states have acted through legislation. However, Maryland has established a surcharge to customer's bills, and earmarked the revenue for use by the Secretary of Natural Resources to carry out power plant research. Another Maryland law requires that the electric companies give customers a separately stated, zero-based fuel rate in which actual computed cost per kilowatt hour is given. A recent Maine statute prohibits a utility from requiring a deposit absent substantial proof that a customer is a credit risk. Finally, New York allows the Public Service Commission to fix and alter the format and the information requirements of customer bills and to require indication of adjustment charges.

In the second area--advertising--there are six states which have taken legislative action. California and Alaska will not permit a company to charge a customer, through utility bills, for extra costs incurred by a utility's expenditure on advertising. Nor can municipal utility districts in California expend funds for advertising which will increase energy usage. Minnesota prohibits inclusion of expenses designed to influence public attitudes toward legislation, to defend a rate change, or to promote consumption. Additionally, Minnesota prohibits

advertisements for insulation which claim that a certain percentage of fuel costs or dollar amount will be saved by additional insulation, unless the statement is accompanied by a disclaimer that savings are only estimates and may vary with type of home and weather conditions. Montana has a new law which disallows advertising expenses unless advertising applies to energy conservation or availability of alternative energy forms. Oklahoma has a similar statute and allows advertising expenses when the intention is to encourage industrial development as well. Finally, Vermont has new legislation prohibiting advertising to influence public opinion.

New legislation on public hearings varies from support for consumer activities, similar to that detailed above, to provisions for hearing procedures. California passed a bill which ensured that all Public Utilities Commission meetings would be open except for meetings on pending litigation. Hawaii has required that a hearing be held before building a 46 kilovolt or greater high voltage electric transmission system above the ground surface through residential areas. In South Dakota the Public Utilities Commission was given the authority to hold hearings concerning utility activities.

There has been too little activity in each of these areas to warrant generalization. Nonetheless, the three sets of activities represented here are certainly important and deserve additional consideration.

Tax Relief

One method often used to encourage conservation of fossil fuels is the provision of tax relief to those who attempt to utilize alternative energy sources or to use existing energy sources more efficiently. Two major instances of this approach are solar energy tax relief and home weatherization tax relief.

Solar Energy Tax Relief

A larger number of states have enacted legislation allowing for some type of solar energy tax relief. The total includes the following thirty-two states; Arizona 1977 and 1979; Arkansas 1977; California 1976 and 1977; Connecticut 1977; Georgia 1976; Hawaii 1976; Illinois 1975; Indiana 1975; Iowa 1978; Kansas 1977; Maine 1977; Maryland 1976; Massachusetts 1978; Michigan 1976; Minnesota 1978; Montana 1977; Nevada 1977; New Hampshire 1975; New Jersey 1978; New Mexico 1977; New York 1977; North Carolina 1977 and 1978; North Dakota 1977; Oklahoma 1977; Oregon 1975 and 1977; South Dakota 1975; Tennessee 1978; Texas 1977; Vermont 1976; Virginia 1976 and 1977; and Washington 1977. As indicated below these states represent a large variety of population sizes and geographic locations.

Table 1E: Summary of Solar Energy Tax Relief Legislation By Geographic Regions

Region	#	%	States
Midwest	6	85%	Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio
New England	5	83%	Connecticut, Maine, Massachusetts, New Hampshire, Vermont
West	5	83%	Arizona, California, Nevada, Oregon Washington
South West	4	66%	Kansas, New Mexico, Oklahoma, Texas
Southeast Coastal	3	60%	Georgia, North Carolina, Virginia
Great Plains	3	50%	Montana, North Dakota, South Dakota
Mid-Atlantic	3	42%	Maryland, New Jersey, New York
South	2	33%	Arkansas, Tennessee
External	1		Hawaii

Table 1F: Summary of Solar Energy Tax Relief Legislation By State Population

Population	#	%	States
<2 million	9	50%	Hawaii, Maine, Montana, Nevada, New Hampshire, New Mexico, North Dakota, South Dakota, Vermont
2-4	9	60%	Arizona, Arkansas, Connecticut, Iowa, Kansas, Minnesota, Oklahoma, Oregon, Washington
4-6	7	77%	Georgia, Indiana, Maryland, Massachusetts
>6	7	77%	California, Illinois, Michigan, New Jersey, New York, Ohio, Texas

The six net energy producing states comprise fifty percent of that group. These include: Kansas, Montana, New Mexico, North Dakota, Oklahoma, and Texas. Sixty-six percent of the net energy consuming states are also found in this category. These results suggest that there is a strong ground swell of interest in solar power which cuts across state energy situations.

The various laws can be grouped into three categories according to the type of tax relief provided: income, property, and sales. In the case of income tax relief, the typical provision allows for a tax credit for the installation of solar (and sometimes other non--fossil fuel powered) devices. There is often a limitation on the amount of the credit.

Solar income tax credits are allowed in Arizona, Arkansas, Georgia, Hawaii, Iowa, Kansas, Michigan, Montana, New Mexico, North Carolina, North Dakota, Oklahoma and Oregon. The New Mexico provision applies to the construction of solar energy systems for irrigation pumping purposes. All the other states apply incentives to residences or do not appear to distinguish between residential and corporate installations. Arizona specifically allows that a taxpayer may amortize the adjusted basis of any solar energy device based upon a 36 month period. In computing taxable income, such amortization is to be subtracted over the period.

Some states limit the amount of credit. For example, in Oklahoma a credit of up to 25% of the cost of a solar energy device is allowed (not to exceed $2,000). This can only be claimed once for any item. The same percentage is allowed in Kansas, but only up to $1,000. North Carolina and California also set limits on the amount of the exemption. There the credit may equal 55% of the acquisition cost of a solar system up to a maximum of $3,000.

Another major type of tax relief is property tax relief. This is found in legislation passed in California, Connecticut, Georgia,

Illinois, Indiana, Kansas, Maine, Maryland, Minnesota, New Hampshire, New York, Nevada, North Carolina, Oregon, Tennessee, Texas, South Dakota, Vermont, Virginia and Washington. Typically, these statutes prevent any increase in value of a property due to the installation of solar devices by excluding such devices in the assessed valuation of the property. In most of the states which have this feature, the tax relief appears to be state mandated. In Maryland and Vermont however, the state gives the local taxing authorities the power to grant exemptions at their discretion. In some states the tax exemption applies for a limited period. For example, California law applies only from 1979-1983, while the exemption available in Washington covers a seven year period. New York allows the tax relief for a period of 15 years. Other states such as Nevada place a limit on the amount of exemption (e.g., Nevada $2,000).

The third type of relief is sales tax exemption. This is used in Arizona, Connecticut, Massachusetts, New Jersey, Ohio, and in Texas. The Ohio law is somewhat complex. It allows for relief upon receipt of an energy conservation, or thermal efficiency improvement certificate from the tax commissioner of the state. Receipt of the certificate is conditioned on submittal to the commissioner of a narrative description of the proposed facility, along with estimated reductions in fuel or power usage or consumption. The law also requires that the Director of the Department of Energy submit a written advisory opinion.

The extensive activity taking place in these three areas of tax relief is an important component of the states' efforts to conserve energy can draw public attention to the need for conservation. The majority of this legislation directly affects individual taxpayers. As such, tax relief is one method by which legislatures can quickly promote the adoption of solar energy technology by providing direct incentives to a large audience.

Tax Relief - General

Four states - Arizona, Indiana, North Carolina, and Ohio - have passed laws allowing tax relief for insulation and other types of home weatherization. Arizona allows a tax credit for 25% of the cost, not to exceed $100, for the installation of insulation or wind driven turbine ventilators. North Carolina allows for a 25% credit, not to exceed $100 for home insulation, storm windows, and storm doors. Indiana permits a deduction from adjusted gross income if during any particular year an individual installs new insulation, weather stripping, storm windows or storm doors in his home. The amount is the lesser of the amount paid for labor and materials, up to $1,000.

The state of Ohio has recently passed legislation allowing an individual to claim a credit of 5% of the total cost of home improvements, up to a maximum of $65. Such improvements include installation of insulation, storm doors and other structural features. Another limitation on the credit is that it can only be taken once every three years.

In another approach, Iowa allowed an individual to deduct payments for fuel taxes in 1974.

It is clear that developments in the area of tax relief have advanced most rapidly in the field of solar energy development. There has been much less legislative activity in home weatherization. This may be partially due to the fact that utility companies, in cooperation with public utilities companies, have taken the lead in this latter field.

Building Codes

Building code regulation is an area receiving considerable attention as legislatures attempt to invoke standards in the construction

and operation of structures to minimize the waste energy. These regulations cover a wide scope of activity, both in the public and private sectors.

Thirty-one states enacted building code legislation during the study period. These states included: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Indiana, Iowa, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin and Wyoming. These states were representative of all areas of the United States. The division of states into regions shows the following characteristics:

Table 1G: Summary of Building Code Legislation By Geographic Regions

Region	#	%	States
West	6	100%	Arizona, California, Nevada, Oregon, Utah, Washington
Southeast Coastal	4	80%	Florida, Georgia, North Carolina, Virginia
Midwest	5	71%	Indiana, Iowa, Minnesota, Ohio, Wisconsin
New England	4	67%	Connecticut, Maine, Massachusetts, New Hampshire
Mid-Atlantic	4	57%	Delaware, Maryland, New Jersey, New York
Great Plains	3	50%	Idaho, North Dakota, Wyoming
South	2	33%	Alabama, Tennessee
Southwest	2	33%	Colorado, Texas
External	1	50%	Hawaii

The data show that while four regions have at least two-thirds of their states enacting building code legislation, these regions are widely dispersed and there does not appear to be a geographic pattern to this activity It is noteworthy however, that all of the Western states have passed legislation in this area.

Table 1H illustrates the distribution of state by population.

Table 1H: Summary of Building Code Legislation By State Population

Population	#	%	States
<2 million	9	50%	Delaware, Hawaii, Idaho, Maine, Nevada, New Hampshire, North Dakota, Utah, Wyoming
2-4	8	53%	Alabama, Arizona, Colorado, Connecticut, Iowa, Minnesota, Oregon, Washington
4-6	9	89%	Georgia, Indiana, Maryland, Massachusetts, North Carolina, Tennessee, Virginia, Wisconsin
>6	6	67%	California, Florida, New Jersey, New York, Ohio, Texas

There appears to be a slight pattern in the data to suggest that the larger the population of a state, the more likely the state will be to pass building code legislation.

Only thirty-three percent of the net energy producing states passed building code legislation (North Dakota, Texas, Utah and Wyoming), while sixty-nine percent of the net energy consuming states passed such legislation (Alabama, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Indiana, Iowa, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Tennessee, Virginia, Washington, and Wisconsin).

The legislation passed in this area ranges from rather stringent construction requirements to advisory recommendations. Moreover, some laws are applicable only to state buildings, others apply only to private facilities, and still others apply to both types of buildings. The laws can be categorized into four major classifications: (1) state codes or regulations for state buildings, (2) state requirements applicable to private, non-public buildings, (3) advice and guidance, and (4) advisory projects.

State Codes

Twenty-five of thirty-two states passing building code legislation turned portion of their legislative effort toward regulation of state buildings (The reader should keep in mind that some states passed more than one law.) These states include Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Indiana, Maine, Maryland, Massachusetts, Minnesota, New York, North Carolina, North Dakota, Ohio, Oregon, Tennessee, Texas, Utah, Virginia, Washington, and Wyoming.

Significant variation in these laws can be observed from state to state. In Alabama, the State Building Commission is authorized to enforce a state building code for all buildings constructed after May 1978 with state appropriated funds. A subsequent law required that all public buildings, not just state buildings, conform to the code. In addition, Alabama requires the Director of the State Building Commission to prepare a code for buildings that are not state-funded. Arizona extends its law beyond the regulation of state buildings, to state supported colleges. In addition, Arizona limits the application of its code to buildings larger than 10,000 square feet. Wisconsin includes as part of the cost for upgrading schools the costs attributable to the upgrading of school buildings to energy efficient standards.

The legislation passed in the study period also varied in the content of the standards enacted. The State Building Commission in Texas adopted and promulgated building standards covering insulation, lighting, ventilation and effective use of new energy efficient systems. Other states enacted laws of lesser scope. For example, Hawaii requested the Department of Accounting and General Service and the Department of Transportation to utilize efficient lighting such as sodium lamps where appropriate. Georgia requires that its standards deal with both lighting and thermal efficiency. New York has adopted standards similar to Georgia's but further stipulates that lighting in public buildings be cost effective. This is defined to mean that implementation costs must not exceed the present value of energy and

maintenance savings that would be expected over a seven-year period. For areas of thermal efficiency, New York requires that the code incorporate the standards of the American Society of Heating, Refrigeration, and Air Conditioning Engineers. New York also specifies performance objectives and recommendations for the use of modern technology. The content of the legislation reveals some uniformity in the area of lighting and thermal efficiency but some states went further than others in instituting reforms such as life cycle costs.

Ohio is one example of a state instituting life cycle cost calculations. This entails a comparison of the costs of installing and utilizing conservation measures over their useful life with the energy savings expected to result from the project. In addition to ensuring that energy conservation goals be observed in the design, construction, renovation, and utilization of state-owned or assisted facilities, Ohio also requires that life cycle cost analyses be submitted by agencies wishing capital improvements. Life cycle cost calculations for state buildings are also mandated in Colorado, Connecticut, Maine, Maryland, North Carolina, Washington and Wyoming. The trend toward life cycle cost analysis is fairly recent with all such bills having been passed after 1975.

Another area of energy conservation laws concerns the application of state-mandated standards to local government subdivisions. North Dakota requires that each political subdivision be responsible for enforcing the provisions of its state building code for the construction of new buildings. It stipulates further that inspection is required or no construction will take place. Application of energy conservation standards is a feature of Minnesota law for buildings owned by the state, the University of Minnesota, any city, county, or school district. However, cities, counties and school districts are not mandated to follow the standards.

A final field of inquiry under the rubric of state-owned or public building energy conservation is that of performance goals. Eight states specified performance goals for the conservation of energy in state

buildings. These include: Maryland, Minnesota, New Hampshire, New York, North Dakota, Ohio, Oregon and Virginia. Most of the states mention conservation goals referring to a general criteria proposed either by reference to a state policy or a standard recommended by a professional organization such as the Delaware Society of Professional Engineers. An important exception is Oregon's law, which requires that the Energy Conservation Board and the Department of Energy adopt standards which will lead to a 20% reduction in energy consumption by 1980.

State Requirements Applicable to Private Non-Public Buildings

States with energy code requirements beyond public buildings include: Alabama, Arizona, California, Colorado, Georgia, Florida, Iowa, Maryland, Massachusetts, Minnesota, New York, Nevada, North Carolina, North Dakota, Ohio, Tennessee, Vermont, Washington and Wisconsin. As in the previous section, the laws proved to be quite varied.

Many states apply the code to both new and existing buildings. These include the states of Alabama, Arizona, California, Colorado, Georgia, Florida, Iowa, Minnesota, New York, Nevada, North Carolina, Ohio, Utah, Washington and Wisconsin. Several states started out making the code applicable to new buildings but later added provisions applying it to existing buildings as well. Other states limit the applicability of the law to new buildings only. These include Maryland, Massachusetts, North Dakota and Tennessee.

The contents of the legislation passed were diverse. Iowa's law is quite general, requiring the energy conservation parts of the state building code be reviewed by inspectors in buildings. The conservation of energy through thermal and lighting efficiency standards is mandated for "buildings intended for human occupancy or use." Ohio requires thermal and lighting efficiency standards and has also established standards for attic insulation and weatherization improvements such as caulking and window plastic. However, the implementation of these

standards is left to local authorities. Colorado and Minnesota provide loans backed by the state to aid in the reduction of total energy requirements in low-to-moderate income housing facilities.

Advice and Guidance

A number of states have passed legislation which is designed to provide energy conservation guidance to other government agencies and private citizens. Early legislation aided the establishment of state building codes, while later attempts were designed to enhance efforts of existing agencies.

Early legislation in Oregon (1973) required the appointment of a State Structural Code Advisory Board to assist in drawing up a building code. In New York (1974), legislation required that the Department of Public Service and other state bodies supply technical services in the preparation of the building code. In Virginia (1974), the State Building Code Technical Review Board was created and established in the Office of Housing in order to offer advice on the formation of a building code which would conserve energy.

Later legislation emphasizes technical advice to improve already established codes. Georgia (1978) established the Energy Standards Advisory Committee to consult with the State Building Administration Board in reviewing standards it has adopted. Idaho (1975) established the Idaho Building Code Advisory Board, to determine the suitability of alternative materials and methods of construction as well as to establish uniformity in procedures for enforcing existing codes. Utah's (1977) State Building Board has the responsibility of providing guidance and advice requested by political subdivisions on the design of energy efficient structures and in the enforcement of codes. In New Hampshire (1977) it is the responsibility of the Governor's Council on Energy "to promote the adoption and use of standards for all new buildings, either public or private." Finally, a review and assistance role is given

to the Building Standards and Advisory Committee in Arizona (1978) to assist the Director of the Office of Economic Planning and Development in the performance of his duties (primarily in the area of supervising the state building codes). Thus, while early legislation emphasizes research, later legislation emphasizes advice and review.

To some degree, a few states emphasize both research and review. California has had a number of developments. The State Energy Resources Conservation and Development Commission is to prepare a manual outlining methodology by which governmental agencies (and the general public) may compare the life cycle costs of different building designs and develop guidelines for new construction. The same agency is given the responsibility to develop a public domain computer program that will allow contractors and government officials to estimate energy consumed by various classes of buildings. Finally, the California agency, in cooperation with other state agencies, is to participate in the design, construction, and operation of energy conserving buildings, in order to demonstrate the economic and technical feasibility of such designs.

Advisory Projects

Another way of providing advice is through demonstration projects. Three states, California, Delaware and Utah, entered this field in recent legislation. In California, the State Energy Resources Conservation and Development Commission, in cooperation with other state agencies, conducts demonstration building projects for the purpose of enhancing the economic and technical feasibility of designs. These projects are designed to save energy in buildings, not only in design, but also in construction and operation. In Delaware, the legislature asked the Delaware Society of Professional Engineers to make a study relating to more efficient use of space heating and cooling equipment within all state-owned, operated or controlled buildings and facilities. Finally, in Utah, the State Building Board must establish and maintain a building project consisting of dwellings designed to minimize the use of scarce and costly energy supplies.

In summary, this legislation can be characterized as extremely diverse. Those states which are net energy consumers tend to be more active in enacting building code legislation. Similarly, the greater the population of a state, the more likely it is to have building code legislation. There seems to be no regional pattern for states passing building codes, although Western states are clearly the most active.

Rate Design

The design of rate structures is largely the responsibility of the regulatory agencies having jurisdiction over a state's utilities. Authority over such activity is typically delegated to public utility commissions. This category, then, is the least likely in the study to show a great deal of legislative activity. In fact, the states' judicial systems are engaged in rate design activities to a greater extent than are the legislatures, as those tribunals are the final arbitrators of many rate disputes. Nevertheless, several types of entries that deal with the cost of energy--both to the consumer and to the producer--can be cited as products of legislative action concerning rate design.

In contrast to action taken by state regulatory commissions, where the focus is typically on a single utility, legislative enactments in this area are often directed at the commissions themselves or at utilities in the aggregate. Moreover, because such legislation can be characterized by diversity and scarcity, it is necessary to categorize it into rather broad classifications. Thus, the legislation deals with a broad range of areas including conditions which justify a rate increase, rate base costs, authority to adjust rates, fuel adjustment clauses and rate design studies.

During the study period, ten states passed legislation stipulating specific conditions under which rate increases could or could not be justified. In this category, Arizona, Arkansas, Florida, Maryland, South Dakota and Virginia all passed laws prohibiting a rate increase by a

utility without prior approval of its respective Public Utility Commission. In addition, Illinois and Oklahoma both passed laws stating that no electric or gas public utility shall increase rates or enforce a surcharge on the basis of the use or installation of a solar device by a consumer. California and Pennsylvania also passed laws concerning justified rate increases. California's law imposes a surcharge upon any customer purchasing electricity from the federal government (for example, rural electric cooperatives) and Pennsylvania limits fuel cost increases to the costs of handling the fuel or costs resulting from waste disposal. California also passed a law mandating that a utility company must prove it has participated in projects designed to generate or produce energy from renewable resources or in systems capable of meeting environmental pollution standards prior to a rate increase approval.

In the area of rate base costs, five states passed laws stipulating specific costs which may or may not to be included in the cost of energy to the consumer. These include a California law requiring the Public Utilities Commission to allow for the inclusion of research and development costs in utility rates. Also, Utah amended its definition of a "just and reasonable" charge by a public utility for its service to include the phrase, "means of encouraging conservation of resources and energy." These two measures, then, demonstrate one of the purposes behind proper rate design--allowing a return to the utility which is sufficient to allow for an improvement in operations, seen either through increased efficiency or in the better use of supplied energy by the user.

An action which differs from rate design per se is legislation which delegates authority to a regulatory commission to approve or disapprove proposed rate changes. As such, the states of Minnesota, Oklahoma, Rhode Island, South Dakota and Texas have passed legislation in this area. The Oklahoma Corporation Commission was given the rate-making authority and general jurisdiction over all supply systems of natural gas, steam heat and steam serving the general public. Similar authority was delegated to the Public Utilities Commission in South Carolina, although the grant here encompassed all public utilities.

Other bills categorized here deal with the procedural operations of public utility commissions. An example is the Minnesota statute which allows for a 90 day suspension of a change in rates without conducting a hearing as required by previous law.

A specific power that is often delegated to regulatory commissions concerns the proper use of fuel adjustment clauses. Regulation of this device has become increasingly necessary as the cost of operation for utilities has been exaggerated by inflation. Utilities have often used fuel adjustment clauses as the primary mechanism through which to distribute the fluctuating cost of energy required in their production process to their customers.

Hawaii, Illinois, Mississippi, New Hampshire, North Carolina, Ohio, Oklahoma, South Dakota, Virginia and West Virginia have all passed laws concerning the use of fuel adjustment clauses. These laws typically fall into two classes, those designed to check the use of fuel adjustment clauses and those promoting their use. Included in the former group is a Mississippi law prohibiting a utility from raising its rates through a fuel adjustment clause if this action would result in receipts in an amount more than the actual cost of fuel burned or consumed in its electrical generating facilities and the cost of purchased energy. Ohio has passed two laws limiting the use of fuel adjustment clauses. The first law states that the public utilities commission shall design a purchased gas adjustment rule that establishes a uniform clause to be included in the schedule of gas companies. The second law states that a fuel adjustment clause may not be filed if it is aimed solely at covering fluctuations in delivery and acquisition costs. Also in this category, Virginia and West Virginia each passed laws requiring their public service commissions to hold a public hearing on the propriety of an increase in the charge for electricity through any automatic or fuel adjustment clause. North Carolina passed a law which terminated all monthly fuel adjustment rate increases based solely upon the increase in fuel costs. Oklahoma's law prohibits

any automatic fuel adjustment clause which permits charges or amendments to existing rate schedules without first being approved by the state body regulating public utilities.

States promoting the use of fuel adjustment clauses include Illinois which passed a measure empowering its public utilities commission to make rate changes through the application of fuel adjustment clauses or purchased gas adjustment clauses. South Dakota's fuel adjustment ruling authorizes its public utilities commission to adjust the rate classifications upward or downward provided the anticipated receipts will not exceed the amount of the return requested. Finally, Hawaii's law requests the public utilities commission to investigate the fuel adjustment mechanism as a regulatory device for revising public utility rates.

The final category encompassed in this section is that of rate design study. Such studies differ in scope, but are concerned with achieving a similar end; discovering the most efficient rate structure to allow for the conservation of energy on the part of the consumer and to promote better operations on the part of the producers. The states of Alaska, California, Hawaii, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Jersey, North Carolina, Pennsylvania, Rhode Island, South Dakota, Virginia and Texas have engaged in rate design studies.

House resolutions from Texas and Hawaii illustrate one end of the spectrum in initiating comprehensive studies of alternative rate designs and price structures for legislative use. Structures to be investigated include flat rates, lifeline rates, time-of-use pricing, marginal cost pricing and long range cost pricing. Other states have focused on specific types of rate designs, with the bulk of the activity being focused on declining block rate structures. Still, these laws do not limit the areas of study exclusively to that method. The Public Service Commission of Maryland for instance, is charged with examining the declining block rate method used by electric and gas companies as a basis for existing rate structures for all classes of users. The purpose of

the study is to determine relationship between existing rate structures and demand. In addition, the commission is to investigate alternative rate structures which would encourage efficient use and promote conservation of energy resources which are in short supply.

The North Carolina Utilities Commission was directed to conduct a study to determine whether conservation of electricity and economy of operation would be encouraged if each electric public utility would notify its customers of the anticipated peak demand periods and urge them to refrain from using electricity at these peak times of the day. If this proved to be the case, it would be advantageous to include such notification in the standard operating procedure of utilities.

Similarly, the California State Energy Resources Conservation and Development Commission was directed in 1975 to adopt standards for a program of electrical load management for each utility service area. Among those items to be taken into consideration were adjustments in rate structure to encourage use of electrical energy at off-peak hours.

Another rate design method receiving attention is that of lifeline rates. These studies are typically conducted by the public utilities commission or a similar body of a state and cover both gas and electricity. One example is a Massachusetts directive to the Department of Public Utilities to investigate the question of adopting proposed lifeline legislation. Such legislation designates a minimum volume of gas and quantity of electricity necessary to supply the minimum energy needs of the average user.

The geographical distribution of the states that passed laws concerning rate design is as follows:

Table 1I: Summary of Rate Design Legislation By Geographic Regions

Region	#	%	States
New England	4	66%	Maine, Massachusetts, New Hampshire, Rhode Island
Southeast	3	60%	Florida, North Carolina, Virginia
Mid-Atlantic	4	57%	Maryland, New Jersey, Pennsylvania, West Virginia
Midwest	4	57%	Illinois, Michigan, Minnesota, Ohio
South	3	50%	Arkansas, Kentucky, Mississippi
Southwestern	3	50%	New Mexico, Oklahoma, Texas
West	3	50%	Arizona, California, Utah
Great Plains	1	17%	South Dakota
External	2		Alaska, Hawaii

It is evident that states all over the country are actively involved in rate design, since seven of the eight major geographic divisions have at least half of the states involved in this activity. When this level of legislation is viewed with the knowledge that the vast majority of rate design activity is conducted in administrative arenas, the significance of structures which provide becomes clearer.

The population dispersal is as follows:

Table 1J: Summary of Rate Design Legislation By State Population

Population	#	%	States
<2 million	9	50%	Alaska, Hawaii, Maine, New Hampshire, New Mexico, Rhode Island, South Dakota, Utah, West Virginia
2-4	6	40%	Arizona, Arkansas, Kentucky, Minnesota, Mississippi, Oklahoma
4-6	4	44%	Maryland, Massachusetts, North Carolina, Virginia
>6	8	88%	California, Florida, Illinois, Michigan, New Jersey, Ohio, Pennsylvania, Texas

Of the twenty-seven states engaged in rate design, only six are net energy producing states. These comprise 50% of that category and include Alaska, Kentucky, New Mexico, Oklahoma, Utah, and Texas. The

remaining states make up just under 53% of the net energy consuming states. Thus, concern over proper rate design is equally shared by states regardless of their energy production status. This comparison is atypical of other parallels drawn on this characteristic in other sections of this report.

2. ENERGY MANAGEMENT AND CONSERVATION

Engineering

Efficient energy management and conservation of natural gas and electricity can be affected by a number of factors. Rate structures, laws, administrative rulings, and engineering innovations are several such factors. Efficiency factors to be examined here are those which rely upon technological or engineering improvements to modify energy utilization patterns or to reduce the amount of energy consumed. Two areas receiving the attention of legislatures during this period are load control and cogeneration.

Load Control

The aspect of load control covered by state legislation was the use of load control devices by consumers. The area receiving the greatest amount of legislative attention is that of natural gas curtailment. Legislation in this category is often concerned, for example, with the unnecessary use of natural gas associated with pilot lights. Considerable effort has been made to correct this situation through the push to develop ignition devices.

Other bills categorized under load management include those involving air conditioning standards and other home appliances. Our examination of recent laws indicated eleven states with specific load control legislation. These states include Arizona, California, Connecticut, Illinois, Maryland, Minnesota, New Mexico, New York, North Carolina, Ohio, and Oregon.

The states are listed below in terms of their geographical location, and their population.

Table 2A: Summary of Load Control Legislation By Geographic Regions

Region	#	%	States
West	3	50%	Arizona, California, Oregon
Midwest	3	42%	Illinois, Minnesota, Ohio
Mid-Atlantic	2	28%	Maryland, New York
Southeast Coastal	1	20%	North Carolina
New England	1	16%	Connecticut
Southwest	2	16%	New Mexico

Table 2B: Summary of Load Control Legislation By State Population

Population	#	%	States
<2 million	4	26%	Arizona, Connecticut, Minnesota, New Mexico
4-6	3	33%	Maryland, North Carolina, Oregon
>6	4	44%	California, Illinois, New York, Ohio

Natural gas conservation efforts dealt most often with the replacement of gas pilot lights with intermittent ignition devices. Nine laws were enacted addressing this goal since 1975. Six of these actually prohibit the selling or installation of nonintermittent devices. The states comprising this group are Arizona 1976, California 1975, Minnesota 1977, New York 1979, Ohio 1978, and Oregon 1977.

While California and Arizona make the prohibition of appliances with continually burning pilot lights contingent upon the development of intermittent ignition devices and their subsequent certification (i.e., by the State Energy Resources Conservation and Development Commission of California and the Arizona Corporation Commission), the other states apparently feel that there are adequate devices of this sort already available. For example, the New York state legislature prohibits the sale of certain gas appliances for use in a residence and requires that appliances be labeled with the words "intermittent ignition" if they have such a device.

Recent legislation has also dealt with the use of air conditioners. Both the Ohio and Minnesota bills specifically address the problem arising from an over-reliance on such appliances. Minnesota has decreed that after January 1, 1978 no new room air conditioner shall be sold or installed unless it has an energy efficiency ratio of 7.0 or higher.[1] The state of Ohio prohibits the selling of air conditioners, heaters, refrigerators, stoves, or other household appliances other than water heaters that are operated by natural gas and have a continuously burning gas pilot light. Products comprising inventories on December 31, 1979; however, can still be offered for sale if the inventory of the product during that month does not exceed the average monthly inventory of the product during 1979. The states of Connecticut (1978) and New York (1977) have also shown concern over the energy usage of air conditioning. In Connecticut as of January 1, 1978 all public buildings may not be cooled to a temperature below 68^{0} unless otherwise authorized by the commission.

Attention has also been focused on hot water heaters; Ohio law has already been cited. New York and Connecticut have also passed legislation in this area. New York prohibits the advertising or selling of a new electric, gas-fired or oil-fired hot water heater unless it meets the following requirements: for automatic electric storage water heaters, the standby loss shall not exceed four watt hours per hour per square foot of tank surface area; for automatic gas or oil-fired water heaters, the minimum recovery efficiency shall be 75% and for automatic gas or oil-fired storage water heaters the standby loss may not exceed a percentage of energy input equal to 2.3 plus the quotient of 67 divided by the rated volume in gallons of the heater. Connecticut demonstrates the attempt to reserve valuable resources for high priority uses by prohibiting the use of natural gas for the heating or illumination of swimming pools.

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[1]The ratio of the cooling capacity of the air conditioner in thermal units per hour to the total electrical inputs in watts.

Cogeneration

Two cogeneration bills have been passed. One of these states is California. In 1978 (effective 1/1/79) the legislature declared that cogeneration technology is a potential energy resource and should be an element of the state's energy supply mix. It found that cogeneration technology should receive immediate support and commitment from state governments. The producers of cogenerated energy were placed under the authority of the Public Utility Commission.

New Jersey preceded this effort in 1977 by requiring its Department of Energy to evaluate electric cogeneration and process steam production associated with cogeneration facilities in order to encourage such facilities.

Planning and Analysis

A significant amount of recent state legislation has dealt with planning and analysis issues. Included here are requirements for demand forecasting, assessment of power pooling opportunities and establishing plant siting procedures and standards.

Demand Forecasting

Eleven states have passed legislation specifically directing an agency to engage in forecasting activities or to monitor those activities when they are undertaken by utilities. These states are: Arkansas 1973; California 1975; Connecticut 1976; Massachusetts 1973, 1974 and 1976; Minnesota 1977; New Jersey 1977; New York 1978; Ohio 1978; Pennsylvania 1976; South Dakota 1977; and Virginia 1976. It is likely that many state departments of energy or state energy offices carry out a similar function in preparing a comprehensive state energy plan while not being legislatively mandated to do so.

Only one of the states which has passed legislation requiring demand forecasts is a net energy exporting state (Arkansas). It appears that this area is of much greater interest to energy importing states, who must carefully plan to meet future needs.

The states involved in forecasting are listed below in terms of geographic location and population.

Table 2C: Summary of Demand Forecasting Legislation By Geographic Regions

Region	#	%	States
Mid-Atlantic	3	42%	New Jersey, New York, Pennsylvania
New England	2	33%	Connecticut, Massachusetts
Midwest	2	28%	Minnesota, Ohio
Great Plains	1	20%	South Dakota
Southeast Coastal	1	20%	Virginia
South	1	16%	Arkansas
West	1	16%	California

Table 2D: Summary of Demand Forecasting Legislation By State Population

Population	#	%	States
<2 million	2	11%	Connecticut, South Dakota
2-4	2	13%	Arkansas, Minnesota
4-6	2	22%	Massachusetts, Virginia
>6	5	55%	California, New Jersey, New York, Ohio, Pennsylvania

The states of Arkansas, Massachusetts, South Dakota, and Virginia have focused directly upon specific utilities in the effort to institute planning procedures. The Public Service Commission of Arkansas requires each utility to submit annual load and resource forecasts and a description of major facilities that will be needed in the upcoming two years. Virginia's State Corporation Commission conducts similar activities.

South Dakota and Massachusetts both require long-range forecasts. The Public Utilities Commission of South Dakota requires every utility

which owns or operates, or plans to own or operate energy conversion facilities within the next ten years to develop and submit a ten year plan to the Commission.

The Energy Facilities Siting Council of Massachusetts requires every electric company to file a long range forecast with respect to the electricity needs and requirements of its market area. Also falling under the Council's jurisdiction are oil facilities and gasoline suppliers. Every gas company is required, individually or jointly with others, to file with the Council a long range forecast with projections for the amount of gas for the New England area. The Council reserves the right to reject inadequate forecasts and to impose fines.

Other states have given different energy-related bodies the responsibility of conducting forecasts. Among these is the Minnesota Energy Agency which includes five and ten year forecasts of demand and availability as part of its coal impact studies. The New York State Energy Office makes five, ten and fifteen year forecasts of future energy requirements. In an effort to maintain a high degree of comprehensiveness the legislature further mandates that every member of the New York Power Pool prepare annual long-range plans and forecasts. Included are anticipated system loads, peak loads, required replacement, and the effects of possible load management.

The Division of Energy Planning and Conservation of the New Jersey Department of Energy, the California State Energy Resources Conservation and Development Commission, the Pennsylvania Bureau of Conservation Economics and Energy Planning, the Division of Planning and Forecasts within the Ohio Department of Energy, and Ohio's Department of Transportation are also responsible for making various energy forecasts.

The energy demand forecasting area has received a moderate amount of legislative attention. This appears to be of greatest concern to net energy consuming states particularly those located in the northeastern part of the country.

Pooling

Two other techniques which have come to states' attention as they attempt to meet their energy needs are power pooling and plant siting.

Power pooling is the authorization of interconnections among utilities and formation of gas and electric utility cooperatives. Pooling legislation may also include permission for municipalities within a state to engage in energy production. All of these activities are aimed at a single goal, which is to minimize the duplication of facilities and achieve more efficient energy production. The states which have passed pooling legislation since 1973 are listed below.

Table 2E: Summary of Pooling Legislation By Geographic Regions

Region	#	%	States
New England	5	83%	Connecticut, Maine, New Hampshire, Rhode Island, Vermont
SE Coastal	4	80%	Florida, Georgia, North Carolina, South Carolina
Midwest	5	71%	Illinois, Indiana, Michigan, Minnesota Wisconsin
West	4	66%	California, Oregon, Utah, Washington
Great Plains	3	50%	Nebraska, South Dakota, Wyoming
South Western	3	50%	Colorado, Kansas, New Mexico
South	2	33%	Mississippi, Tennessee
Mid-Atlantic	2	28%	New York, West Virginia
External	1		Alaska

Table 2F: Summary of Pooling Legislation By State Population

Population	#	%	States
<2 million	11	61%	Alaska, Maine, Nebraska, New Hampshire, New Mexico, Rhode Island, South Dakota, Utah, Vermont, West Virginia, Wyoming
2-4	8	53%	Colorado, Connecticut, Kansas, Minnesota, Mississippi, Oregon, South Carolina, Washington
4-6	5	55%	Georgia, Indiana, North Carolina, Tennessee, Wisconsin
>6	5	55%	California, Florida, Illinois, Michigan, New York

Of the twenty-nine states only Kansas, New Mexico, West Virginia, and Utah are net energy exporters (41% of net energy exporters versus 61% of net energy importers). An examination of the percentages shown in the above listings indicates that considerably more activity has been generated in the area of pooling (as we have defined it) than in some of the previously discussed areas. The substantial attention given to pooling might be due to the fact that such action generally makes use of existing technology and conforms with accepted economic theory, i.e., encourages the maximization of economies of scale. As such, it is less expensive, both in terms of monetary outlay and in the political resources necessary for consensus building.

Twenty-one pieces of legislation might be grouped together because they are all concerned with municipalities' ownership of energy producing entities. For simplicity we will refer to these entities as cooperatives since the majority of them involve a municipality's working jointly with another utility or a municipality's production of energy in addition to, or in lieu of, the utilities normally serving a municipality. Such cooperatives include those concerned with electricity, gas, hydroelectric, and thermal energy.

The Colorado, Connecticut, Maine, Michigan, Nebraska, North Carolina, Oregon, Vermont, West Virginia, Wisconsin and Wyoming statutes specifically authorize the formation of electric cooperatives. These laws generally allow for the formation of joint operating agencies among cities to plan, acquire, construct, own, operate and otherwise promote the development of utility properties for the generation and transmission of electric power and energy. The regulating agency for such jointly owned concerns varies e.g., Public Utility Commission of Oregon and the Department of Public Service in Vermont.

The production of electricity is not confined solely to the municipal arena. A House Resolution in Rhode Island created a special legislative commission to study the feasibility of the state's developing

and owning any and all new electric generating facilities within the state. In the same vein, the Alaskan legislature authorized the creation of regional electric authorities to alleviate shortage of adequate, safe, reliable electrical facilities in the rural areas of the state.

The private sector has also received notice here. The states of Florida, Maine, Minnesota, and New Hampshire have passed legislation affecting the operations of electrical companies engaged in cooperative associations, though these laws make no specific mention of municipal participation.

Other statutes, such as in Mississippi, imply that electricity may be the primary focus of a cooperative while not specifically limiting the cooperative to that form of energy. A municipality or joint agency of that state may participate as a tenant in a common project with one or more municipalities or joint agencies. The Board of Public Utilities will determine the needs of a given municipality and regulate its participation. While Kansas has a similar bill, other states have specifically designated non-electrical energy generation as the purpose for cooperatives. For example, New York and Utah have authorized cooperative agreements to carry out research and development activities into oil and gas; New York through its Energy Research and Development Authority and Utah through its Division of Oil, Gas and Mining in the Department of Natural Resources. Nebraska and South Carolina have similar legislation.

Two additional examples of states utilizing a cooperative entity to promote the production of an electric energy source are those of California and New York. Both of these states have passed legislation promoting the development of hydro-electric power through municipal organizations. California authorized municipal water districts, county water authorities, and the Monterey County Flood Control and Water Conservation District to provide, generate and deliver hydroelectric power and utilize its property and water for such purpose. The New

York statute authorizes the State Power Authority to enter into contractual arrangements with municipal corporations with respect to construction, improvement, or operation of hydroelectric generating facilities.

For the purpose of meeting the future energy needs of its municipalities Indiana has authorized them to plan, finance, develop, construct, or improve their energy producing capacity in conjunction with one another or with public utilities. The criteria to be utilized in evaluating the municipalities' future power requirements include the economies and efficiencies to be achieved in large scale generation of electric power, and the needs for reserve and peak capacity. This particular measure was passed over the governor's veto in 1978.

It appears that significant legislative interest exists in the area of power pooling. In six regions at least half of their states have passed pooling legislation. Also, state population does not seem to be a determinant of interest in power pooling because more than half of the states in each population category have passed this type of legislation. In general many states are interested in this form of resource planning regardless of geographic location or population size. However, there are more net energy consuming states passing this type of legislation than net energy exporters.

Plant Siting

Another important function addressed by state legislatures is the proper placement of energy generating facilities.

Forty-five recent legislative enactments were categorized under the heading of plant siting. These primarily included those measures establishing bodies possessing plant siting authority or those requiring the issuance of some certificate prior to the construction and/or operation of a facility. These states are listed in table 2G.

Table 2G: Summary of Plant Siting Legislation By Geographic Regions

Region	#	%	States
Great Plains	4	66%	Montana, North Dakota, South Dakota, Wyoming
South Western	4	66%	Kansas, New Mexico, Oklahoma, Texas
Southeast Coastal	3	60%	Georgia, North Carolina, Virginia
New England	3	50%	Connecticut, Massachusetts, New Hampshire
West	3	50%	California, Oregon, Washington
Mid-Atlantic	3	42%	Maryland, West Virginia
South	2	33%	Mississippi
Midwest	2	28%	Iowa, Minnesota
External	1		Tennessee, Hawaii, Illinois

Table 2H: Summary of Plant Siting Legislation By State Population

Population	#	%	States
<2 million	7	38%	Montana, New Hampshire, New Mexico, North Dakota, South Dakota, West Virginia, Wyoming
2-4	9	60%	Arkansas, Connecticut, Iowa, Kansas, Mississippi, Minnesota, Oklahoma, Oregon, Washington
4-6	5	55%	Georgia, Maryland, Massachusetts, North Carolina, Virginia
>6	3	33%	California, New York, Texas

Seventy-five percent of the net energy exporting states are listed. These include Arkansas, Kansas, Montana, North Dakota, West Virginia, New Mexico, Oklahoma and Texas. Only thirty-eight percent of the net energy importers are found here. It appears that legislative activity in the area of plant siting is very prevalent throughout the nation with no particular geographic distribution. This is true for population as well. Nonetheless, it seems that a correlation might be drawn if we examine the states along a different variable particularly suited for a discussion of plant siting, which is geographic size. Of the twenty-four states represented, sixty-two percent (15 of 24) are among the largest half of all the states in terms of total geographic area. It seems, then, that a disproportionate amount of geographically large states engaged in siting activities during the study period. Still, we

must caution against taking the correlation between state area and the likelihood of engaging in plant siting activities as given.

The states of Georgia, West Virginia, Massachusetts, Minnesota and Oregon have recently instituted bodies empowered with siting authority. The Oregon Council consists of seven public members appointed by the governor to conduct and prepare studies, investigations, and research and development programs relating to site selection. The Council is further directed to designate suitable areas for siting nuclear-fueled plants and geo-thermal plants and to establish standards that applicants must meet.

The Minnesota Power Plant Site and Transmission Line Route Selection Authority within the Environmental Quality Board has the duty of ensuring that state environmental policy is to be followed in the site selection process. Other statutes also conform to this trend, i.e., New York, Massachusetts. This introduces a point which will be expanded on in the discussion of resource development in Section Four of this report: energy and environmental issues are often jointly considered.

The other newly established bodies are the Energy Facilities Siting Council of Massachusetts, the West Virginia Shallow Gas Well Review Board, and the Georgia Power Plant Siting Study Committee. Kansas might also be included within this group if one considers the establishment of boundaries of service areas in the regulation of electric utilities. The State Corporation Commission was created and is charged with that function. (In New Hampshire, this authority was given to its Public Utilities Commission.) Other states have delegated regulatory powers to already established bodies.

The states of California, Connecticut, Iowa, Kansas, Massachusetts, New York, North Carolina, South Dakota, Washington, West Virginia, and Wyoming have passed legislation requiring the issuance of a certificate or permit prior to the construction or operation of a facility.

These statutes cover a variety of energy producing facilities and pertain to a number of different regulatory agencies. For example, the State Corporation Commission of Kansas must issue a permit for the construction of electric generating facilities or the exercise of eminent domain in the acquisition of land for the facility. Likewise a 1978 measure by the New York legislature extended an earlier provision that prohibits the commencement of the preparation of a site for a major steam electric generating facility in the state without having first obtained a certificate of environmental compatibility and public need with respect to such a facility. A final example is the Secretary of Natural and Economic Resources in the State of North Carolina who oversees the issuance of permits for the construction and operation of oil refinery facilities. In addition, such facilities are required to observe the laws regarding environmental quality. Other certificates are required for the construction of high voltage transmission lines. The Public Service Commissions of West Virginia and Wyoming have authority over such activity.

The states of Oregon and Mississippi have passed legislation exempting a utility from securing a site certificate. The Public Service Commission of the latter state has been directed to allow municipalities proposing to jointly finance a facility to do so without first receiving the Commission's approval. In Oregon, the Department of Energy no longer requires a site certificate for the construction or expansion of any inter-state natural gas pipeline if the Federal Power Commission has already done so.

Two other states are cited to emphasize the diversity of siting legislation. Georgia and West Virginia were found to have passed statutes concerning the spacing of wells; both oil and gas in Georgia, but only gas in West Virginia. The West Virginia legislation was alluded to in the citing of the newly created Shallow Gas Well Review Board. This body has the authority to hold hearings concerning proposed drilling or deepening of shallow wells, issuing orders concerning

applications for drilling permits, and making relevant investigations of records and facilities. The Board is to recommend to the Department of Mines whether a drilling permit should be issued. The Georgia "Oil and Gas and Deep Drilling Act of 1975" charges the Board of Natural Resources with the regulation of all drilling activities. Specific powers with respect to the exploration or production of oil and gas include the spacing of wells after an investigation and a hearing.

Massachusetts has been a most active state in the siting area. Along with the establishment of the Energy Facilities Siting Council, the legislature mandated that all electric companies petition the Council for a certificate of environmental impact and public need. This requirement has subsequently been extended to gas and oil companies. Most recently the Council has been charged with promulgating rules and regulations with the Department of Public Utilities regarding hydroelectric power. Still, the state has not given total authority to the Council over plant siting matters. In 1975 the legislature authorized a statewide vote as to whether to allow the construction of an oil refinery on one of its ports.

3. ORGANIZATIONAL DESIGN

State Energy Offices and Departments of Energy

The increasing significance of energy related issues and the need for policy coordination among the various levels of government has lead to a proliferation of state energy offices and departments. Legislatures have increasingly attempted to formalize authority in this area so that responses to emergency situations can be augmented by on-going research, planning and monitoring activities. Although not all of these recently created state agencies have the same specific responsibilities, their general purpose is to develop and implement state energy policy.

Six states have recently established their own departments of energy while fifteen have instituted a state energy office, or similar body. These agencies are typically charged with developing and implementing the state's energy policy. The number of smaller agencies, commissions and councils invested with portions of such duties is increasing at a rapid rate as well. These total well over 20 and serve primarily in an advisory or research capacity. Nor is the phenomenon confined to the executive branch. State legislatures in Kentucky and Vermont have established advisory committees to investigate alternative sources of energy and to report to their colleagues. Still, nearly all of these smaller bodies supplement the activities of the larger administrative entities.

The following states have newly developed Departments of Energy: Oklahoma 1974; Oregon 1975; Nevada, New Jersey, and Ohio1977; and Kentucky 1978. The states of Arizona, Iowa and Minnesota,1974; California, Maine, North Carolina, and Ohio 1975; Georgia, New York, and Washington 1976; Arkansas, Louisiana, Nebraska, and Tennessee 1977; and Illinois 1978 have established new State Energy Offices such as the Iowa Energy Policy Council, the Georgia Office of Energy Resources and the State Energy Resources Conservation and Development Commission in California.

The states show a wide dispersal over geographic areas and while there are concentrations in specific regions, there is no apparent pattern in the data.

Table 3A: Summary of Energy Office and Energy Department Establishment Legislation By Geographic Regions

Region	#	%	States
West	5	83%	Arizona, California, Nevada, Oregon, Washington
South	4	66%	Arkansas, Kentucky, Louisiana, Tennessee
Midwest	4	57%	Illinois, Iowa, Minnesota, Ohio
Southeast Coastal	2	40%	Georgia, North Carolina
Mid-Atlantic	2	28%	New Jersey, New York
Great Plains	1	16%	Nebraska
New England	1	16%	Maine
Southwest	1	16%	Oklahoma

There is a random distribution pattern in terms of population although greater representation is found in state with at least 2-4 million in population, than in those falling into the smallest population category.

Table 3B: Summary of Energy Office and Energy Department Establishment Legislation By Geographic Regions

Population	#	%	States
<2 million	3	11%	Maine, Nebraska, Nevada
2-4	9	60%	Arizona, Arkansas, Iowa, Kentucky, Louisiana, Minnesota, Oklahoma, Oregon, Washington
4-6	3	33%	Georgia, North Carolina, Tennessee
>6	5	55%	California, Illinois, New Jersey, New York, Ohio

All of the states except Kentucky, Louisiana and Oklahoma are net energy importers, no doubt indicative of these latter states' respective coal and oil reserves. The states comprise 25% of the net energy exporters and 43% of the net energy importers.

As previously mentioned, the primary function of these bodies is the implementation of the states' energy policy through collection and dissemination of energy related information, the development of contingency plans for the allocation and conservation of energy, advisory activities, and research and development operations. None of the 21 bodies as initially constituted, was mandated to carry out all four of these activities. Rather, each concentrates its efforts in specific areas taking into account the already existing energy programs within its state. For example, the Nevada Department of Energy is charged with preparing a state energy conservation plan which provides methods for conserving and improving efficiency in the use of energy resources. In addition, the department is to recommend to state agencies, local governments and others, standards for energy conservation. This latter provision, however, applies only to those energy resources for

whose use priorities have not been established by the Nevada Public Service Commission.

Some agencies have more comprehensive duties than others. The Iowa Energy Policy Council consists of appointees of the legislature and the governor. The council is to present an annual report on fuel development, utilization and conservation of all energy resources in Iowa. This report also contains a summation of the council's latest activities, which include the development of a comprehensive state energy conservation plan for implementation of its policy. Finally, through the creation of a central depository of energy data, the council can recommend and develop public education and communication programs on energy conservation. This collection of data also permits the governor to utilize the council as an advisory body. This move to centralize the implementation of energy policy at one level is in evidence in other states as well.

The state of Ohio has similar resources upon which to rely by virtue of its development of a comprehensive agency. In 1975 the Ohio Energy and Resource Development Agency was given the following responsibilities: implementing state energy policy under federal laws, promoting and maximizing the efficient use of energy, collecting information concerning sources, users, and suppliers of energy; and devising contingency plans that provide for conserving and allocating the supply of energy in the case of an emergency. In 1977, this agency was remolded into a Department of Energy whose additional responsibilities include the coordination of energy planning, conservation, research and development efforts in the state.

Thus, the states of Iowa and Ohio demonstrate the move by legislatures to centralize the implementation of energy policy at one level.

The overall function of these agencies, then, is to implement energy policy and to be instrumental in the development of that policy. While

the efforts of these agencies might be concentrated in different areas, the functions being performed all contribute to that primary objective, i.e., the coordination of energy planning, conservation, research and development activities within a given state.

Advisory Bodies

Supplementing the above mentioned agencies are a variety of newly constituted advisory commissions and research divisions. Focus at this level is typically on a single aspect of the energy problem. Perhaps the area receiving the greatest amount of attention in light of the oil situation is coal.

Among those bodies constituted to promote or assess increased coal development are the following: the Coal Research and Development Division within the Ohio Department of Energy; the Virginia Center for Coal and Energy Research at the Virginia Polytechnical Institute and State University; and the Virginia Coal Research and Development Advisory Committee; an Energy Advisory Council on Coal Development to advise the Division of Energy within the Illinois Department of Business and Economic Development (this division was transferred to the Illinois Institute of Natural Resources in 1978); an Energy Research Commission in Illinois to promote the establishment of a coal resource, research and development center in the state by the federal government; the Colorado Energy Research Institute at the Colorado School of Mines; and an Advisory Committee for the Coal Production Development Fund in Kentucky; and the Oil, Gas and Mining Board within the Nevada Division of Mineral Resources. The particular research and development activities of some of this group will be covered later in this report. This list serves as verification that the states are active in promoting the development of energy sources other than oil. It also implies that the success of a state's energy policy in successfully coping with an energy emergency, is contingent, not only upon its Department of Energy or State Energy Office, but also on the supplementary bodies which support and assist those agencies in the performance of their duties.

Office of the Governor

A second means by which some states are attempting to cope with the energy problems is by increasing the power of their governors. These officials have recently witnessed an expansion of their emergency powers in times of domestic peril. Such an accretion of power ranges from authority limited to the approval of others' action (e.g., Public Service Commission's contingency plans for allocation in Georgia) to that of commandeering any private property during times of emergency (e.g., California).

While the phenomenon is no doubt related to the precedent of traditional gubernatorial authority in energency situations, it is also likely that legislatures recognize that the chief executive of a state is in a better position to effect the decisive and immediate implementation of a contingency plan designed to avoid the financial and personal hardships associated with a lack of heating fuel in the winter or a shortage of gasoline in the summer. As chief executive, a governor has authority over those bodies which will carry out that contingency plan i.e., the departments of energy and state energy offices.

One must caution, however, against assuming that the legislatures have given the executive branch complete discretion in handling an energy emergency. Quite often, the expansion of power is put into effect for a limited time period, subject to legislative approval. Emergency powers in relation to energy shortages have also been temporarily delegated to specific government agencies with permanent power retained by the legislature itself.

Included among the powers of the governor is the regulation of the operating hours of state government offices and agencies. At least three states have passed legislation in this area (Iowa 1974, Georgia 1977 and Minnesota 1977) since 1974.

Implicit in these three laws is the curtailment of services through orders concerning the times when certain buildings will remain open, the working hours, and the work days and week of state employees. Still, each law differs in its comprehensiveness. These powers apply to private institutions as well as the state government in Iowa. In Georgia the governor may determine the degree to which certain buildings may be heated or cooled.

In keeping with the trend to limit such powers, legislatures subject governors to certain stipulations. In Minnesota the law was in effect for the duration of a specific energy emergency (1/18/77-4/1/77). In Iowa the powers are determined in part by (or in cooperation with) the Energy Policy Council.

The strongest move in increasing an executive's power in the energy area is the granting of the authority to issue a declaration of an energy emergency in terms of a shortage without an accompanying time limit. The governors of Ohio 1976, Washington 1976, Montana 1977 and Nevada 1977, have recently acquired such power and thus join a number of others already enjoying this privilege. Some of the executives included in this latter group are those from the states of Delaware, New York, North Carolina, Oregon and Wisconsin.

Other states have elected to do as West Virginia did in 1974 by empowering its governor temporarily to declare the existence of a fuel emergency. He was further empowered to allocate and distribute gasoline or special fuel to the extent permitted by federal law. Such allocation included establishing quotas and rationing. The law was in effect for a period of 15 weeks in 1974 at the height of the oil embargo's impact.

The declaration of an energy emergency is invariably contingent upon a governor is finding that a fuel shortage is either currently present or imminent. The extent of this "finding" is not elaborated on in the language of the laws other than the statement that an emergency

exists if the President has called a national emergency, or if a given governor views it to be in the best interest of his state in light of a threatening shortage to do so.

The declaration of an emergency by the governor would provide little relief for a state if the action were taken in isolation. As suggested by the West Virginia law, the power to issue such a declaration is typically supplemented by a number of other provisions. These include the authority to set curtailment priorities and to allocate fuel.

Strategies other than actual legislation have also been utilized to boost the powers of the executive office. Joint and concurrent resolutions have been passed in Hawaii requesting the governor to adopt energy conservation standards by executive order to meet federal energy administrative requirements. Arizona's governor has acted under similar legislation regarding state and local government compliance with the Energy Policy and Conservation Act of 1975.

The fourteen states which have expanded gubernatorial power in times of energy emergencies since 1974, fall into six geographic areas:

Table 3C: Summary of Gubernatorial Energy Emergency Powers Legislation By Geographic Regions

Region	#	%	States
West	4	66%	California, Nevada, Oregon, Washington
Mid Atlantic	3	42%	Delaware, Maryland, West Virginia
Midwest	3	42%	Iowa, Minnesota, Ohio
Coastal	1	20%	Georgia
Great Plains	1	16%	Montana
New England	1	16%	New Hampshire
External	—	—	Hawaii

In terms of population the states tend to fall toward the lower end of the scale:

Table 3D: Summary of Gubernatorial Energy Emergency Powers Legislation By State Population

Population	#	%	States
<2 million	6	38%	Delaware, Hawaii, Montana, Nevada, New Hampshire, West Virginia
2-4	4	26%	Iowa, Minnesota, Oregon, Washington
4-6	2	22%	Georgia, Maryland
>6	2	22%	California, Ohio

All except West Virginia and Montana are energy importers. Thus 16% of the exporters and 30% of the exporters are represented.

Of the ten states cited as currently or previously empowering their governors to issue a declaration of an energy emergency as they deem fit, all but Oregon and Delaware lack an energy agency within the Office of the Governor. It might be concluded, then, that governors have been given such power to offset their inability to directly oversee the implementation of contingency plans when an agency carrying out this responsibility is not under the governor's direct supervision.

Accepting the above proposition, one may be further led to believe that these states feel that centralizing energy powers in a single office is pursuant to the amelioration of an energy shortage. On closer examination, however, it is discovered that six of those eight states have also added a Department of Energy or a State Energy Agency/Office to their organizational structure during the same time period. Additionally, the four states of California, Iowa, Minnesota and Georgia have established both Departments of Energy and State Energy Offices.

Significant changes in organizational design have occurred during the period of this study. The western states have been most active in both establishing state energy offices and departments, as well as expanding gubernatorial powers to handle energy crises. The southern and midwestern states have also been active in the establishment of state energy agencies, although given the southern tradition of a strong

executive, there was no expansion of gubernatorial authority in those states. The growth of advisory agencies has been slower than other organizational changes and their focus has been narrower.

4. RESOURCE UTILIZATION

Resource Development

The development of the nation's resources is one objective or focus of United States' energy policy. The United States is presently involved in the development of traditional energy sources such as oil and coal, as well as renewable sources such as biomass and solar power. Energy resource development is one of the primary responsibilities of the many departments and agencies established to implement state energy policies.

A major impetus for resource development within the United States has been the shortage of available oil supplies and the curtailment of importation opportunities. The higher cost of most fuel resources often makes it possible to explore alternatives that had previously been considered economically infeasible. Thus we see a growing emphasis on the development of nontraditional energy sources available within our national borders.

In addition to the 19 states with newly created energy agencies, legislatures across the United States have affected the development of energy sources by directing a variety of agencies to conduct studies into specific energy areas. The resource development areas receiving the most attention by state legislatures are solar, geothermal, coal, nuclear, gas and oil. Each is discussed below in greater detail.

Solar Energy

Research into the area of solar energy has been given priority in certain states in the effort to maintain an adequate and continuous

supply of energy and to accelerate development and use of renewable energy sources. The states which have been most active in this area legislatively are California and Arizona with a total of fifteen separate pieces of legislation. Other states such as Colorado, Florida, Georgia, Hawaii, Illinois, Kansas, Maryland, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Rhode Island, Utah, and Virginia have participated in the trend to develop solar energy, bringing the total number of states involved to twenty. Here, we are concerned only with the states engaging specifically in solar energy research.

It is intuitively appealing to assume that states with the warmest weather would be most likely to engage in solar energy research. This expectation is borne out by the fact that there is a high concentration of these states in the western and southern geographic regions of the U.S.

Table 4A: Summary of Solar Energy Research Legislation By Geographic Regions

Region	#	%	States
Southeast Coastal	4	80%	Florida, Georgia, North Carolina, Virginia
Southwest	4	66%	Colorado, Kansas, New Mexico, Oklahoma
West	3	50%	Arizona, California, Utah
Mid-Atlantic	3	42%	Maryland, New Jersey, New York
Midwest	3	42%	Illinois, Michigan, Minnesota
Great Plains	1	16%	North Dakota
New England	1	16%	Rhode Island
External			Hawaii

It is further supported by the fact that California and Arizona have produced one-third of the legislation in this area (i.e., 15 laws of 45).

In terms of population the twenty states are dispersed toward the upper end of the spectrum:

Table 4B: Summary of Solar Energy Research Legislation By State Population

Population	#	%	States
<2 million	5	27%	Hawaii, New Mexico, North Dakota, Rhode Island, Utah
2-4	5	33%	Arizona, Colorado, Kansas, Minnesota, Oklahoma
4-6	5	55%	Florida, Georgia, Maryland, North Carolina, Virginia
>6	5	55%	California, Illinois, Michigan, New Jersey, New York

Two states which have established agencies charged solely with the development of solar energy are Arizona and Virginia. In 1975 the Arizona Solar Energy Research Commission was constituted to help carry out the energy policy of the legislature. Emphasis was placed on efforts to expedite the development and use of renewable energy sources i.e., solar power. In 1977 the Virginia legislature established a Solar Energy Center in the Energy Office to collect data and coordinate programs dealing with solar energy. Most states, however, have merely delegated new duties to existing bodies. Among these states is California, which has increasingly relied upon the State Energy Resources Conservation and Development Commission for this purpose.

Initially the California Commission was to develop regulations concerning solar devices, i.e., rules governing their performance level and standards for installation. This function was to be performed in cooperation with affected industry and consumer representatives, after at least one public hearing. The regulations were to be designed to encourage development and use of solar energy and to provide the public with maximum information concerning such devices. The commission was further directed to prepare for the mass market deployment of solar systems by developing designs and specifications for prototype housing to utilize passive or semipassive thermal systems for heating or cooling purposes, and to conduct studies into solar energy sources. In 1979, the commission was required to conduct a statewide architectural design competition incorporating solar devices in design features.

Arizona has shown a similar interest in solar development. Prior to the establishment of the Arizona Solar Energy Research Commission, the legislature charged the Arizona Power Authority with encouraging the development of electric power deemed feasible from solar energy. Additionally, the authority was granted the power to sell or rent state land to persons engaged in projects to develop solar energy. Later the Arizona Solar Energy Research Commission was directed to encourage the development of solar energy through educational and informational programs. This approach appears to be an important part of much of the legislation in this area.

The states of Colorado 1974, Kansas 1977, Maryland 1977, New Mexico 1977, North Dakota 1977, Georgia 1978, Minnesota 1978, and California 1979 have utilized the policy of granting easements to promote the installation of solar devices. The purpose of solar easements is to allow the owner of a solar device to negotiate for assurance of continued access to sunlight. It serves little purpose to equip a building with a solar heating device if that device is later blocked from the sun.

California has made similar assurances in guaranteeing a certain amount of sunlight. After 1 January 1979 an owner of property is prohibited from permitting a tree or shrub to be placed or grown, subsequent to the installation of a solar collector on another's property, that will cast a shadow greater than ten percent of the collector's absorption area between the hours of 10:00 a.m. to 2:00 p.m. Such specific restrictions are not generally incorporated into other states' laws.

Restrictions in other areas are also being promulgated to protect the owners of solar devices. A 1978 New York provision requires that all contracts for the installation of solar energy devices be in writing to prevent fraud. A 1977 Illinois enactment forbids public utilities from considering the use of solar energy by a customer as a basis for establishing higher rates or charges for any service (i.e., applies only to utilities providing electrical or gas service).

Another area where actions designed to affect the rapid development of solar energy have been taken, is that involving land use. The Arizona Power Authority was authorized as early as 1974 to sell or rent state-owned property to persons engaged in projects to develop solar energy (as well as nuclear and geothermal) for the production of generated electricity. Subsequently, Minnesota in 1978 mandated that a local comprehensive plan include an element for protection and development of access to direct sunlight for solar energy systems.

Finally, a number of states have expressed a desire to have a federally established Solar Energy Research Institute located within their boundaries. Arizona, California, Colorado, Massachusetts, Michigan, Minnesota, New Jersey, New Mexico and Utah are included in this group. Activity in this area typically consists of authorizing a conveyance of state lands for the siting of such an institute or adopting a resolution urging Congress and the President to select a given state as the location for the Institute.

Geothermal Energy

Much of the legislation on geothermal energy involves the delegation of authority to specific existing agencies or departments within a given state. Such authority generally includes the management of a state's lands or the encouragement of this resource's use through research and development activities. Oregon 1971; Idaho 1972; Colorado 1974 and 1975; Nevada 1975 and 1977; Lousiana 1976; and Maryland 1978, are examples of the first activity, while Washington 1974, Louisiana 1975, Oregon 1975, Utah 1975; California 1976; and New Mexico 1977 exemplify the second type.

Of note are the years in which the Idaho bill and one of the Oregon bills were passed. Both are pre-1973 and thus occurred prior to the Arab oil embargo. In fact, the bulk of the legislation dealing with the development of this resource has long since been initiated. The two

bills are mentioned here only to emphasize this point and will be excluded from further discussion. Consequently, the amount of new legislation in this area is less than that found in "newer" energy areas.

Nine states can be cited as recent participants in the development of geothermal resources. These are listed below in terms of geographic location:

Table 4C: Summary of Geothermal Energy Research Legislation By Geographic Regions

Region	#	%	States
West	6	100%	Arizona, California, Nevada, Oregon, Utah, Washington
Southwest	2	33%	Colorado, New Mexico
South	1	16%	Louisiana
Mid-Atlantic	1	14%	Maryland

The fact most apparent from this list is that the vast majority of work in this area is being conducted by states located in the western portion of the United States.

These states fall into the following population categories.

Table 4D: Summary of Geothermal Energy Research Legislation By State Population

Population	#	%	States
<2 million	3	16%	Nevada, New Mexico, Utah
2-4	5	33%	Arizona, Colorado, Louisiana, Oregon, Washington
4-6	1	11%	Maryland
>6	1	11%	California

All states except Louisiana, New Mexico and Utah are net energy importers. Thus only 17% of the net energy importers are represented as opposed to 25% of the net energy exporters. It is significant that the larger percentage occur in the latter group. This suggests that the domination of the net energy importing group over the net energy exporting group in terms of the percentage of states passing legislation, so far reported, is now reversed.

The management of state lands has been a concern in Arizona, Colorado, Louisiana, Maryland and Nevada. Four of the seven pieces of legislation from this group deal specifically with the leasing of public lands. For example, in 1974 the Colorado State Board of Land Commissioners was authorized to lease any portion of the state's land, or any interest therein, for the purpose of exploring producing, and developing the geothermal resources at a rental to be determined by the board. In 1975 this authority was extended to include geothermal resources discovered on land previously leased for other purposes.

The second body of legislation in this area largely concerns research and development activities. In 1976 California established a task force to study aspects of the development of the geothermal resources of the state. The study was extended the following year to the end of 1977. Other states passed similar legislation.

The actual conduct of research was delegated to the Department of Public Lands in Washington (1974) and to the State Department of Conservation in Louisiana (1975). Both of these bodies were charged with conducting research in the effort to exploit potential geothermal energy sources. The former agency was to carry out that function in cooperation with other agencies (government and private). The Maryland Department of Natural Resources was given similar responsibilities, including contracting for research and scientific investigation to determine the potential of this resource. It was further authorized to

conduct projects designed to demonstrate feasibility of utilization. The Public Utilities Commission of California was another agency tapped to encourage the development of geothermal resources. The commission was directed to establish a schedule authorizing rapid amortization of the cost of all public utilities facilities utilizing geothermal resources.

Noteworthy in this discussion is the tendency for states to rely on pre-existing agencies or departments to implement the policy concerning geothermal resources.

Coal Resources

Interest in the development of coal resources has grown rapidly as states search for alternative energy sources to supplement their heavy reliance on oil. A number of new agencies have been recently instituted specifically for the development of coal. Advisory responsibilities are among the specific duties assigned to some of those agencies. The Energy Advisory Council on Coal Development serves in this capacity for the Illinois Institute of Natural Resources, as does the Oil, Gas and Mining Board for the Nevada Division of Mineral Resources. The Virginia Advisory Committee for Coal and Energy Research, the North Dakota Coal Development Impact Office and the Kentucky Advisory Committee for the Coal Production Development Fund are three other bodies engaged in advisory activities.

The remaining agencies in this group (i.e., Coal Research and Development Division within the Ohio Department of Energy, the Virginia Center for Coal and Energy Research, the Illinois Energy Research Commission, the Tennessee Energy Authority and the Energy Research Institute at the Colorado School of Mines) are primarily concerned with research and development activities specifically related to coal. The Illinois agency is also charged with promoting the establishment of a coal resource research and development center by the federal government.

The total number of bills in this category is 24 and the number of states engaged in the development of coal through legislation is 15. The states are listed below in terms of geographic location.

Table 4E: Summary of Coal Development Legislation By Geographic Regions

Region	#	%	States
West	4	66%	California, Nevada, Oregon, Utah
Midwest	4	57%	Illinois, Iowa, Minnesota, Ohio
Southeast Coastal	2	40%	Georgia, Virginia
South	2	33%	Kentucky, Tennessee
Great Plains	1	16%	North Dakota
Southwest	1	16%	Colorado
Mid-Atlantic	1	14%	Maryland

Many of these 15 states belong to that group which can lay claim to the bulk of the nation's coal deposits.

The states fall into the following population categories.

Table 4F: Summary of Coal Development Legislation By State Population

Population	#	%	States
<2 million	3	16%	Nevada, North Dakota, Utah
2-4	5	33%	Colorado, Iowa, Kentucky, Minnesota, Oregon
4-6	4	44%	Georgia, Maryland, Tennessee, Virginia
>6	3	33%	California, Illinois, Ohio

The Ohio Energy and Resource Development Agency offers a useful example of the research activities in which these agencies engage. While this agency is to encourage, promote and support new research, demonstration projects, and programs designed to more efficiently utilize energy resources in general, priority is given to the establishment of one low-heat and one high-heat value coal conversion plant.

In Minnesota, the director of the state energy agency is charged with carrying out a coal impact study to be presented to the legislature. The study is to specify five and ten-year forecasts of demand, discuss the potential for the use of coal gasification, and address the questions involved in bringing about a major shift in energy use from other fuels to coal. This particular piece of legislation is useful in demonstrating a state's efforts to approach a given energy problem comprehensively. The study is to be undertaken with the cooperation of the director of the State Planning Agency, the executive director of the Pollution Control Agency and the Committee of Natural Resources and Transportation. The bill also provided evidence of the coordination function performed by these agencies by requiring consultation with other energy agencies within the state to minimize duplication and to facilitate the realization of economies of scale through the pooling of agency resources.

Other states are also concerned with coal gasification. California has already been cited. The states of Iowa and Kentucky have also given this facet of coal development high priority. The Iowa Energy Policy Council was instructed to prepare an evaluation of the feasibility of the process for purposes of producing combustible gas, while the Kentucky Department of Energy was charged with executing contracts for the construction, operation, development, or demonstration coal gasification projects.

Concerns over the environmental effects of coal development have not gone unvoiced. While this involves pollution control or preservation of the environment, and as such, would not necessarily be included in the discussion of conservation of energy, it is worthy of comment. The specific pollution standards laid down by the Environmental Protection Agency at the federal level are a contingency states must deal with in developing their particular energy policies. In 1978 Kentucky recognized that obstacle and charged the Department of Energy with executing a program designed to develop new and more effective and environmentally safe uses for coal.

Environmental concerns can conversely provide the impetus toward development of coal resources. Thus, coal powered plants are opted for over those powered by other more "dangerous" fuels (in terms of environmental impact). In 1975 the Oregon State Senate issued a resolution requesting the Joint Committee on the Environment to investigate the construction of coal-fired power plants as a viable alternative to the construction of nuclear facilities.

Nuclear Energy

The six states engaged in nuclear energy development through, legislation solely addressing this energy source are New York 1974, 1975 and 1976; Massachusetts 1975; Washington 1976; Louisiana 1977, Maryland 1977 and Vermont 1977. Other states have directed their Departments of Energy or Energy Agencies to engage in research and development of "alternative energy sources," which may include nuclear energy. These are not included in this analysis.

Because there are so few states in this group, it may serve little purpose to view the states in terms of population, geographic area or trade status; still, they are listed below.

Table 4G: Summary of Nuclear Energy Research Legislation By Geographic Regions

Region	#	%	States
New England	2	33%	Massachusetts, Vermont
Mid-Atlantic	2	28%	Maryland, New York
West	1	16%	Washington
South	1	16%	Louisiana

Table 4H: Summary of Nuclear Energy Research Legislation By State Population

Population	#	%	States
<2 million	1	5%	Vermont
2-4	2	13%	Louisiana, Washington
4-6	2	22%	Maryland, Massachusetts
>6	1	11%	New York

The only net energy exporting state within this group is Louisiana, which represents eight percent of the twelve states classified in that group. The other five states comprise twelve percent of the net energy importing group.

Vermont is the only state of the six in which legislation established a new agency solely concerned with the nuclear energy development. Here an advisory panel was created to hold public meetings for the discussion of the use of nuclear power, and to develop awareness in the state of the possible use of nuclear energy.

The states of Washington and New York rely on their state energy offices to perform a similar function. The Washington body is to present the state's interests in the field of nuclear energy to federal, regional and local authorities and to private interests as an identifiable activity within its overall program.

The New York office in 1976 inherited the powers previously vested in the state's Atomic Energy Council. It was directed to encourage cooperation in the development and use of atomic fuel, along with the State Power Authority. It is this latter office which is vested with the actual implementation authority over the state's nuclear policy. In 1974 the Authority was given the discretion to approve the utilization of nuclear fuel when the trustees deem it advisable. The fuel will be supplied and is owned by the State Atomic and Space Development Authority. The following year the authority was permitted to construct facilities utilizing new energy technologies, including baseload nuclear generating facilities. Similar authority is granted to the Washington Department of Commerce and Economic Development as established in 1977. Through its Division of Nuclear Energy Development, it can spend state funds to develop and operate land and facilities which will increase the state's nuclear potential. One means by which this development is to take place is through the use of contracts with state and private institutions for the purpose of doing research into the potential of nuclear power.

Nonetheless, outside of New York and Washington there is very little legislation being passed supporting the development of nuclear energy. Again, this is probably due to the reluctance of legislatures to move into this area when their constituencies are divided in their support of this industry. The Louisiana and Maryland actions appear to be resolutions, the first requesting a review of a study conducted concerning the construction and use of nuclear reactors for generating electricity, and the second urging the development of technology for bringing on-line controlled nuclear fusion reactors.

A 1975 Massachusetts law allowed for a referendum to be placed before the voters of Plymouth, Massachusetts concerning the location of a second nuclear power plant in that town.

Gas and Oil Development

The cost of exploration and development activities is a deterrent to the entry of new firms in both the nuclear energy field and the more traditional gas and oil industries. This is true particularly at the refining and distribution levels, where large capital investments are required. State legislatures have overall been very active in the passage of laws concerning gas and oil development because of the importance of those resources.

The states of Wyoming 1973; California 1974, 1975, and 1976; Oklahoma 1974; Utah 1975; Georgia 1976; Massachusetts 1976; New Mexico 1976 and 1977; New York 1976 and 1977; South Carolina 1976; Kansas 1977; Louisiana 1977; Maryland 1977; Montana 1977; Rhode Island 1977; Tennessee 1977; Texas 1977; Wisconsin 1977; and Kentucky 1978 have passed measures either to conserve oil and gas or expedite their development. The states of Delaware 1975, South Dakota 1975, Florida 1977 and Oklahoma 1978 have provided disincentives for such development via some form of tax.

These states are shown below in terms of population and geographic area. Minnesota is added to the list, as a 1977 measure placed construction and operation standards on gas, oil, and other pipelines previously unregulated by the state.

Table 4I: Summary of Gas and Oil Development Legislation By Geographic Regions

Region	#	%	States
Southwest	4	66%	Kansas, New Mexico, Oklahoma, Texas
Southeast Coastal	3	60%	Florida, Georgia, South Carolina
Great Plains	3	50%	Montana, South Dakota, Wyoming
South	3	50%	Louisiana, Mississippi, Tennessee
Mid-Atlantic	3	42%	Delaware, Maryland, New York
New England	2	33%	Massachusetts, Rhode Island
West	2	33%	California, Utah
Midwest	2	28%	Minnesota, Wisconsin
External	1	—	Alaska

It should not be surprising that there appears to be a correlation between those areas usually associated with having large oil and gas deposits those states enacting legislation.

Table 4J: Summary of Gas and Oil Development Legislation By State Population

Population	#	%	States
<2 million	8	44%	Delaware, Montana, New Mexico, Rhode Island, South Dakota, Utah, Wisconsin Wyoming
2-4	7	45%	Alaska, Kansas, Louisiana, Minnesota, Mississippi, Oklahoma, South Carolina
4-6	4	44%	Georgia, Maryland, Massachusetts, Tennessee
>6	4	44%	California, Florida, New York, Texas

The distribution of states by population suggests that this criterion does little to explain a state's participation in the development of oil and gas. All four categories of population are essentially equal in their level of activity.

Nine out of twelve of those states which can boast of enjoying a surplus of energy in their state are engaged in the development and/or the conservation of their natural gas and oil resources. These comprise 75% of the net energy exporting group as opposed to 35% of the net energy importing group represented here.

The California, Georgia, Maryland, Montana, New York, Rhode Island, Tennessee, Wisconsin, and Wyoming measures are primarily concerned with exploration and development. Tennessee allows a municipality, its agencies or divisions, to engage in investigating, exploring, prospecting, drilling and mining for the production of natural gas and oil, or to build energy facilities, or to contract with federal agencies or other municipalities in accordance with the doctrine of eminent domain. The New York Energy Research and Development Authority was given the power to contract or enter into joint undertakings with gas companies in research and development activities. That same year the California legislature declared that the rapid development of new sources of natural gas and electric energy is contingent upon encouraging private energy producers to develop such sources on an independent and competitive basis. To assist in this development, the California Public Utilities Commission is permitted to authorize the construction of an interconnection by a private energy producer, i.e., pipeline connecting several producers for the purpose of transporting natural gas. Approval is subject to gas located within the state and developed by a public utility. The private energy producer must bear the costs of the interconnection.

California also directed its State Lands Commission to renegotiate the leases on lands for the exploration of oil and gas to reduce the minimum royalty rate or to substitute such other consideration as would be in the best interest of the state. A New York statute concerning the leasing of state lands removes the prohibition against such activity previously placed on land beneath Lake Erie or along its shoreline.

In 1973 Wyoming established its Natural Gas Pipeline Authority for the purpose of planning, financing, constructing and operating a natural gas pipeline which would facilitate production, transportation and distribution of natural gas without being subject to the state's Public Service Commission. Maryland's Department of Natural Resources is directed to encourage the development of oil and gas resources in the state, prevent waste and protect the environment from the effects of drilling, production and underground storage. Maryland had earlier required that an environmental impact statement be submitted for each industry project to develop the oil and gas of the state.

New York and Texas also show concern for conservation. The State Energy Office of New York is charged with evaluating the role of the Interstate Oil Compact Commission with respect to conservation of oil and gas. And the Oil and Gas Commission of Texas is to implement the Underground Natural Gas Storage and Conservation Act of 1977. This act establishes the requirements necessary for building reserves for orderly withdrawal of these reserves during periods of peak demand.

Other measures which address the development of this resource include Delaware's disallowance of deductions for percentage depletion of oil and gas wells in computing taxable income, and Alaska's imposition of an ad valorem tax on oil and gas reserves.

A different type of tax has been utilized by South Dakota. For the privilege of mining or extracting minerals or mineral products, a license tax equal to the amount of four percent of net profits from the mined or extracted materials is assessed.

Some states, particularly New Mexico and Montana have passed resolution requesting federal action on gas and oil related issues. Both of these states have gone on record supporting price deregulation. Montana's resolution focused on natural gas price deregulation, while New Mexico's concerned both oil and natural gas.

From the information we have obtained about the states, it appears that there has been significant legislative attention focused on the issue of gas and oil development. Most states have attempted to encourage the development of these resources. The amount of activity in this area is not surprising because of the traditional importance of these gas and oil supplies as energy sources.

Resource Recovery

An addition to the development of existing and new sources of energy is the concerted effort by states to recoup those resources which have already been utilized in the economy. This remedial action is often intended to supplement development activities and facilitate reaching energy conservation goals.

Since the development of solar energy is aimed at tapping a virtually unlimited source of power, waste is not a significant problem. In contrast, the efficient use of oil, gas and coal is of vital importance because the stockpile of these resources is finite. If an efficient method can be found to indefinitely recycle these latter resources, they, in effect, can be thought of as 'partially renewable'.

While indefinite recycling is an ideal situation and not currently feasible with existing technology, it is a goal to strive for. As such, it is an area receiving substantial legislative attention. Twenty-two separate pieces of legislation have come out of nine different states within the last seven years. These states are California, Georgia, Maryland, Minnesota, New Mexico, New York, Oregon, Utah, and West Virginia. In regard to geographic location these states are dispersed as follows:

Table 4K: Summary of Resource Recovery Legislation By Geographic Regions

Region	#	%	States
Mid-Atlantic	3	42%	Maryland, New York, and West Virginia
West	2	33%	California, Oregon
Southeast Coastal	1	20%	Georgia
Southwest	1	16%	New Mexico, Utah
Midwest	1	14%	Minnesota

With respect to population, these states have the following pattern:

Table 4L: Summary of Resource Recovery Legislation By State Population

Population	#	%	States
<2 million	3	16%	New Mexico, Utah and West Virginia
2-4 million	2	13%	Minnesota and Oregon
4-6 million	2	22%	Georgia and Maryland
>6 million	2	22%	California and New York

Examining the states along these lines provides little opportunity to draw any significant correlations between the characteristics of particular states and legislation in this area. Both classifications show that the nine participants are widely dispersed. However, two other categorizations when viewed together are useful along these lines. The first of these is a listing of the states in terms of their net energy production status.

Table 4M: Summary of States Engaged in Resource Recovery By Energy Trade Status

Importing States 15%	Exporting States 25%
California	New Mexico
Georgia	Utah
Maryland	West Virginia
Minnesota	
New York	
Oregon	

The first aspect to note from this grouping is that the ratio of net energy importing to net energy exporting states. One might expect those states with a trade deficit in energy to be more active in developing methods to "stretch" their energy reserves than would be states with a surplus of energy. This does not appear to be the case here.

A second categorization, according to the number of legislative enactments, lends support to the belief that a net energy importing

state appears to place more emphasis on preserving the resources it has (either its own or its imports) than will a state less in need of energy. The number of enactments per state is as follows:

Table 4N: Summary of States Engaged in Resource Recovery By Number of Enactments

	Number of Enactments
California	6
Minnesota	4
Oregon	4
New York	3
Georgia	1
Maryland	1
New Mexico	1
Utah	1
West Virginia	1
	22

The importing states have passed 19 pieces of legislation in this area as opposed to three by the exporting group.

The primary focus of resource recovery legislation is the treatment of solid wastes. Previously such treatment entailed efforts to minimize the adverse environmental effects of waste disposal. Now considerable attention is being given to incorporating recovery activities in this treatment process. The conservation drive has made people aware that materials possess more than one usable property and that goods need not be disposed of once they have served their initial purpose. A secondary function has been attributed to all types of goods: that of providing energy for subsequent goods through the process of recycling. This conservation ethic is illustrated in the mandates of legislatures for agencies and departments to conduct research and development activities into different recycling methods.

Among those states engaging in research and development projects are California, Minnesota, New Mexico, and New York. California has been the most active state, passing a succession of bills charging its

State Solid Waste Management Board with this responsibility. In 1973 the board was instructed to adopt a solid waste resource recovery program and to conduct special studies and demonstration projects on the recovery of useful energy and resources from solid wastes. More specific duties were assigned in 1977 when it was directed that the program also include the development of alternative sources of energy through the conversion of solid waste material into energy and synthetic fuels.

California continued its efforts in 1978 with the legislature determining that 20% of the State Litter Control, Recycling, and Resource Recovery Fund be allocated for grants and loans to public agencies or private entities for implementation of the state research and development program to recover resources and energy from wastes. And most recently, the board was directed in 1979 to undertake a study on the feasibility of recovering methane gas from landfills and to develop a plan for that purpose.

Three states have created administrative bodies to implement resource recovery programs. In 1977 West Virginia established the Resource Recovery-Solid Waste Disposal Authority. This agency is to carry out the state's policy concerning the proper collection, disposal and recycling of solid waste. The authority is to designate disposal sheds, construct its own sheds, and maintain disposal projects. Finally the authority is to establish loan agreements with firms engaging in similar activities.

Georgia adopted a somewhat more decentralized system the following year. It created a public corporate body in each county and a municipal corporation known as the Resource Recovery Development Authority. The authority receives its powers from the governing body in each area. Its function will be to recover and utilize resources contained in sewage sludge and solid waste.

A third example is the Petroleum Recovery Research Center of New Mexico that was established as a division of the Institute of Mining and Technology in 1977. It is primarily a research oriented body.

The state of Oregon has adopted a twofold strategy in its effort to facilitate a greater reliance on recycled material. Beginning in 1974 the Oregon Department of Environmental Quality was required to withhold its issuance of a certificate to establish a pollution control facility unless a substantial purpose of the facility is to utilize material that would otherwise be solid waste in the operations. A further contingency is that the end product be a usable source of power or other marketable item.

This concern over creating a usable product in the recovery process was implicit in a bill passed the following year, in which the Department of Environmental Quality was directed to incorporate into its functions the establishment of a comprehensive program for solid waste management, the promotion of research, and the conduct of surveys and demonstration projects to encourage resource recovery. The bill also required that all cities, counties and metropolitan service districts include in their solid waste disposal program the promotion and development of markets for energy and materials from resource recovery.

This particular piece of legislation demonstrates Oregon's twofold strategy. Not only is the legislature trying to effect resource recovery but it is also looking for uses for that recovery's product. The state has directed all state agencies purchasing supplies to review their procurement specifications in order to eliminate discrimination against the procurement of recovered or recycled materials.

Another state's activities might also be cited here. Minnesota has offered incentives to expedite its resource recovery program. Specifically, the Public Service Commission is to enforce the policy of providing free transportation (or reduced rates) on the state's railroad network for waste material scheduled for reprocessing.

A secondary focus of legislation in the resource recovery field is that which specifically deals with the recycling of used oil. The states of California, Maryland, Minnesota, New York and Utah have initiated steps to utilize recycled oil. The State Energy Office of New York in 1978 was authorized to direct all state and local officials to act within their authority to encourage the use of recycled oil. Such action is to include the review of any laws which exclude the use of recycled oil products and the education of the private sector as to the merits of recycled oil. The office is also to make rules governing used oil collectors and rerefiners, and to establish oil retention facilities. Maryland instructed its Department of Natural Resources to conduct a similar public education program to inform the public of the need to collect and recycle used oil in order to conserve resources and preserve the environment.

Neither of these two immediately preceeding laws offer a comprehensive program on oil recycling. This might be suggestive of the slight impact oil recycling would have on reducing oil imports. Consequently, states have placed such programs in low priority. This decision is further exemplified by a relatively weak Minnesota measure requiring sellers of motor oil to post a notice indicating where used motor oil may be returned for recycling and to provide a collection tank. Compliance to such a law, would be extremely difficult to assure.

In general, there is less activity in the area of resource recovery than is found in other areas. Perhaps it is a reflection of its minimal impact on a state's energy needs.

5. CONCLUSION

After examining a substantial portion of the data concerning individual state's legislative efforts, we are able to note the

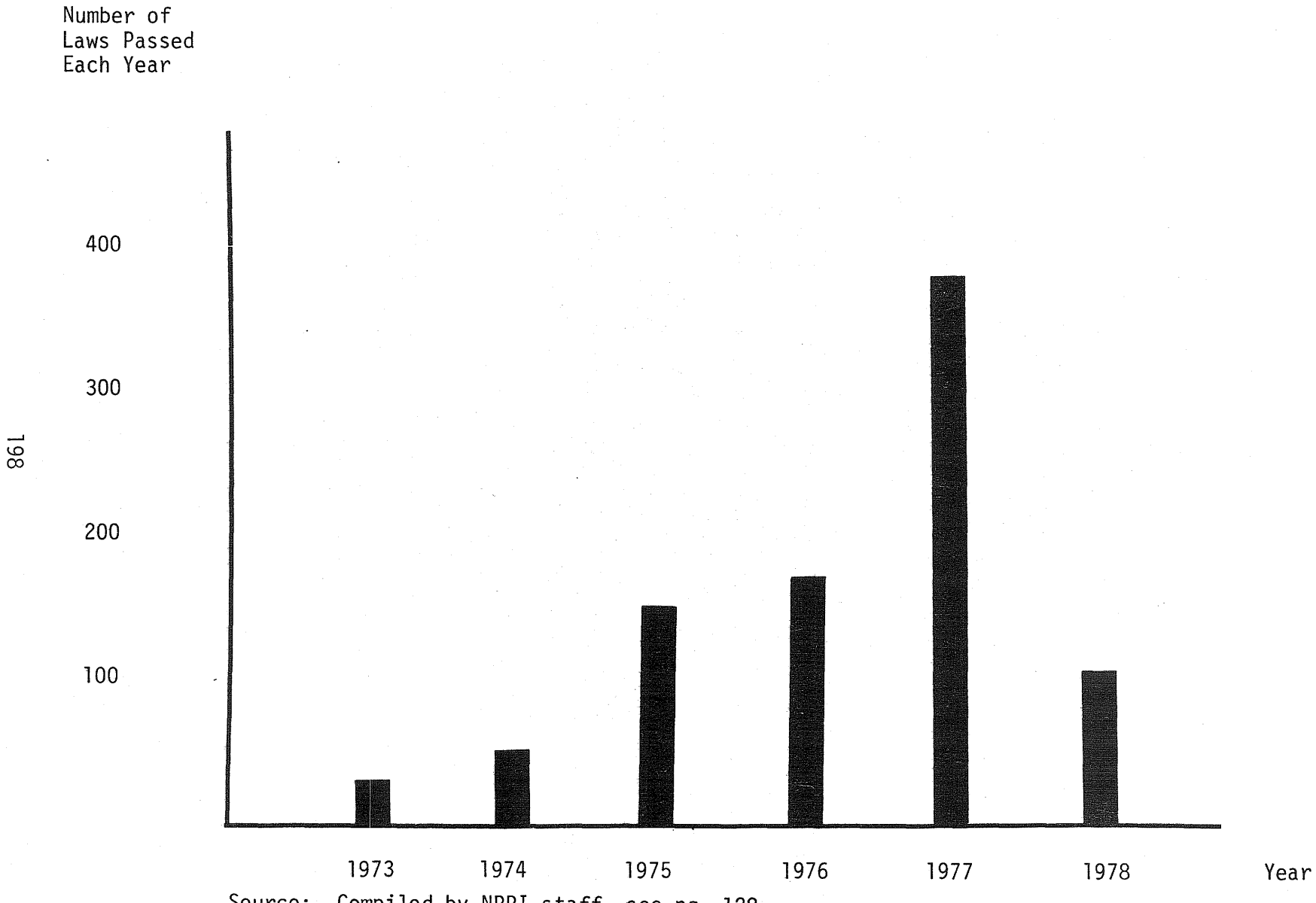
emergence of certain patterns and draw some conclusions.[1] To facilitate this process, comparisons will be made on the same basis they have been throughout this report: state population, geographic region and net energy production status. In addition, the total number of laws passed in a given year will be investigated to provide an overall view. Consequently, the remainder of this report deals with the apparent direction that states, as a whole or in specific aggregates, have chosen to take through their legislative effort to address their energy problems.

Overall Yearly Activity

An examination of Figure 1 indicates that state legislative activity concerning energy has steadily increased from 30 laws in 1973 to 379 in 1977. This quantum jump in activity is perhaps the strongest evidence that legislatures have increasingly perceived the energy situation as a problem warranting a considerable amount of their attention. Overall the effect has been a steady progression. This pattern suggests that either states perceive the energy crisis is worsening or that it has taken some time for legislatures to become cognizant of the problem. Another possibile explanation is the existence of legislative logs in the form of procedural requirements and political concensus development, which appears to slow response time to energy-related issues.

Figure 1 warrants comment in two regards. The 1978 total appears to indicate a reversal of the trend developed between 1973 and 1977, although this is not necessarily the case. Researchers did not have

[1] It is important to caution the reader to accept the state or regional rankings as simply representing the results of a frequency count of bills enacted by a state or the states in a region. No presumption should be posited of any need to pass legislation. Given states might feel they (1) possess sufficient legislation, (2) prefer to employ existing agency or gubernatorial rule-making authority, (3) perceive no immediate need for enactment of a bill in a certain area.



Source: Compiled by NRRI staff, see pg. 128.

Figure 1: Number of Laws Enacted Per Year

access to as much information for 1978, or 1973 and 1974, as they did for the intermediate years of 1975, 1976 and 1977. Consequently the totals for 1978 may be understated. As a result, the graph is somewhat distorted, but still valuable as an indicator of general trends. It seems logical to infer from the data available, that our earlier comments concerning the patterns indicated are correct. The only likely change resulting from an increase in the data set, would be some increase in the totals for the end years of the study.

A second pattern in the data is discernible when attention is focused on the incremental change in the number of enactments between an election year and an off-election year. There was a nearly 150% increase in activity from 1974 to 1975 and a 121% increase from 1976 to 1977. This follows the usual trend of decreased legislative activity during election years since legislators divide their time between campaigning and legislative duties. This hypothesis is supported when the percentage changes from the off-election years and the election years are examined. The first two increments show an increase in state activity, but at a substantially lesser rate than that found in increments after an election year. From 1973 to 1974 there was a 66% increase in energy legislation passed, but from 1975 to 1976 there was only a 14% increase. These data, then, are consistent with the stated hypothesis.

Regional Analysis

While the number of laws passed in a given year tells us something about the overall pattern, regional analysis of legislative activity gives us still another perspective. Table 5A presents some information concerning regional behavior. Eight different regions, and the states of Hawaii and Alaska, are shown along with the following data: total number of legislative enactments passed in each region annually, proportion of total legislation attributable to each region annually, and the average number of enactments per state within each region.

Table 5A: Yearly and Total Number of Bills Passed by Geographic Area

Area	1973 Average Passed Per State	1973 Total Bills by Region	1973 Percent Region of All Bills	1974 Average Passed Per State	1974 Total Bills by Region	1974 Percent Region of All Bills	1975 Average Passed Per State	1975 Total Bills by Region	1975 Percent Region of All Bills
West (6)	1.16	7	23.3	2.16	13	25.5	7	42	28.0
Midwest (7)	.43	3	10.0	1.42	10	19.6	2.42	17	11.3
Mid-Atlantic (7)	.57	4	13.3	1.14	8	15.7	2.42	17	11.3
New England (6)	1	6	20.0	.16	1	2.0	3.66	22	14.6
Southwestern (6)	.16	1	3.3	.83	5	9.8	1.5	9	6.0
South (6)	1	6	20.0	1.33	8	15.7	.83	5	3.3
Great Plains (6)	.5	3	10.0	.66	4	7.8	3.33	20	13.3
Southeast Coastal (5)	0	0	0.0	.4	2	3.9	2.6	13	8.6
External (2)	0	0	0.0	0	0	0.0	2.5	5	3.3

Source: Compiled by NRRI staff, see pg. 128.

Table 5A: Yearly and Total Number of Bills Passed by Geographic Area
(continued)

Area	1976 Average Passed Per State	1976 Total Bills by Region	1976 Percent Region of All Bills	1977 Average Passed Per State	1977 Total Bills by Region	1977 Percent Region of All Bills	1978 Average Passed Per State	1978 Total Bills by Region	1978 Percent Region of All Bills
West (6)	6.3	38	22.2	13.16	79	20.8	3.3	20	19.0
Midwest (7)	3.57	25	14.6	7.42	52	13.7	3.57	25	23.8
Mid-Atlantic (7)	3.57	25	14.6	5.57	39	10.3	4.0	28	26.7
New England (6)	3.33	20	11.7	6.0	36	9.5	1.0	6	5.7
Southwestern (6)	2.5	15	8.7	8.5	51	13.5	.5	3	2.9
South (6)	3.16	19	11.1	4.5	27	7.1	2.5	15	14.3
Great Plains (6)	.83	5	2.9	7.66	46	12.1	.16	1	.95
Southeast Coastal (5)	3.2	16	9.3	5.66	34	9.0	1.2	6	5.7
External (2)	4	8	4.6	7.5	15	4.0	.5	1	.95

Source: Compiled by NRRI staff, see pg. 128.

Table 5A Yearly and Total Number of Bills Passed by Geographic Area
(continued)

Area	Average Passed Per State	TOTAL Total Bills by Region	Percent Region of All Bills
West (6)	33.16	199	22
Midwest (7)	18.85	132	15
Mid-Atlantic (7)	17.28	121	14
New England (6)	15.16	91	10
Southwestern (6)	14	84	10
South (6)	13.33	80	9
Great Plains (6)	13.16	79	9
Southeast Coastal (5)	14.2	71	8
External (2)	14.5	29	3

Source: Compiled by NRRI staff, see pg. 128.

annually, proportion of total legislation attributable to each region annually, and the average number of enactments per state within each region.

The western states have overall been most active in the passage of energy legislation. These states were followed by the Midwest and Mid-Atlantic regions, which were very close in their levels of overall activity throughout the period. The New England and Southwestern states showed the same level of activity throughout the period, and fell in the midrange of the eight continental U.S. regions. At the lowest end of the scale are the Southern, Great Plains, and Southeast Coastal states, exhibiting close to the same level of activity. Alaska and Hawaii together have exhibited the least amount of activity throughout the period.

As another indicator of relative activity, the average number of laws enacted by each state within a region was calculated. The ranking of regional activity discussed above are largely supported by this measure. There are only two exceptions worth noting. The Southeast Coastal states and Alaska/Hawaii would be ranked in the middle of the distribution if average enactments per state within a region were the variable being considered. It appears that when we control for the number of states in a region, the Southeast Coastal states and Alaska/Hawaii are more active in the energy field than is otherwise apparent.

Starting with the most active region, the West, it can be seen that this group of states is the leader in a number of areas. For energy conservation, the West had the highest percentage of states passing bills in the building codes section (100%), was second in the area of "consumer counsel" and third in the area of solar energy tax relief and public information on energy matters. In the area of energy management conservation, the West was most active in only in one area--load control. The West received a higher ranking in the area of organizational design, placing first in legislation pertaining to state energy offices and bills relating to the office of the governor. Finally, the West was quite

active in resource utilization. They were first in the areas of geothermal energy and coal resources; second in resource recovery; and third in the areas of solar energy and nuclear power. The West was not very active in the following categories: rate design, planning, pooling, plant siting and gas and oil development. The trend in legislation in the West appears to be directed toward the creation of energy agencies, development of non-fossil fuel resources, and improved energy efficiency for building codes and load control.

The Midwest passed 132 pieces of legislation and is the second most active region in this period. In the category of energy conservation, the Midwest leads in the area of solar energy tax relief. They are third in legislation providing for the consumer information needed to conserve energy, third in establishing a consumer counsel, fourth in building codes and in legislation on rate designs. The Midwest ranked relatively lower in utility efficiency issues, ranking second in load control, but third in both demand forecasting and pooling, and lower than any other region in passing plant siting legislation. Their record is apparent in the area of organizational design, rating third in legislation creating and establishing energy offices, and second in legislation increasing gubernatorial emergency powers. In the area of resource development, the Midwest is substantially active in developing its coal, where it ranks second. The Midwest has been most active in encouraging the development of solar energy and has also shown an interest in developing organizational units that can deal effectively with energy problems.

In contrast to the pattern of the Midwest where there are many "middle rankings," the Mid-Atlantic states are ranked either very high or very low in terms of the number of bills in most issue areas. In the area of energy conservation, the Mid-Atlantic region was first in passing consumer counsel legislation, and third in the area of rate design. However, this region ranks low in the other areas of energy conservation. The up and down pattern is also noticeable in the area of utility production efficiency, where the Mid-Atlantic

region is first in demand forecasting and third in load control but ranks fifth or lower in the remaining categories. In organizational design, this region was second only to the Western region in passing legislation regarding gubernatorial powers but was fifth in passing legislation regarding state energy offices. Finally, the Mid-Atlantic region is active in resource utilization. It passed legislation in the area of nuclear energy (second) and resource recovery (first). Lack of natural resources is the probable explanation for this occurrence. Thus, although the Mid-Atlantic region ranks third overall passing 121 pieces of legislation, its activity is concentrated in specific categories.

Unlike the Mid-Atlantic region, most of the Southwestern states are exporters of energy. This fact was evident in the legislation these states passed. Their active legislative record in providing tax relief for solar energy places them third among the regions. All other categories ranked fifth or lower. For energy management conservation, rankings are higher; they were second in plant siting, third in pooling and third in demand forecasting. In the area of organizational design, the Southwestern region is last in passing legislation establishing energy offices and has passed no legislation regarding gubernatorial emergency powers. The active concern in the Southwest is resource utilization. They were second only to the West in the percentage of states per region, passing legislation in the area of geothermal energy. Similarly, they ranked second in solar energy and first in the development of gas and oil. Two factors that appear of major importance are climate and resource deposits in these states. The climate makes the Southwest amenable to the development of solar energy. In addition, the fact that four of the six Southwest states are energy exporters (mainly oil and gas) gives a good indication of the legislative activity in the area of gas and oil development. In addition, two of the states have natural geothermal wells to develop. The legislation in this region appears to focus on energy production rather than on energy consumption.

Legislative activity in the New England states appears concentrated in relatively select areas. This region ranks high in the area of energy conservation, having the most states passing rate design measures. Also in this category, New England states rated second among the nine regions in solar tax relief and consumer counsel. The New England states were fourth in the area of building codes; however, the percentage of those passing such codes is quite high (67%). New England is also a leader in some areas of energy management conservation, ranking first in the area of pooling and second in the area of demand forecasting. Resource utilization looks inactive with the important exception of their first place rating in the development of nuclear energy. It is not surprising that New England passed energy conservation legislation and was least active in the area of resource development; they have few resources to develop and must conserve the energy they do have. It might explain why this region passed so much legislation regarding pooling, demand forecasting, and nuclear energy. Thus, New England's fourth place rating among the states is a bit deceiving in that one cannot pass legislation regarding resources one simply does not have.

In contrast to the Southwest, the South has acted in a variety of areas. In the area of energy conservation, the South rates second among the regions, and ranks fifth for energy management conservation. However, the picture changes when one considers organizational design, in which the South rates second for the creation and establishment of energy offices. There was no legislation passed regarding gubernatorial powers. This latter development is deceiving: the South traditionally has very strong governors and thus may have felt no need for legislation to strengthen governors' powers for an energy emergency. In the area of resource development, the South places third in the legislative areas of geothermal energy, nuclear energy and gas and oil. As with the Southwest, the South contains four states that export more energy than they import.

The Great Plains Region passed nearly the same amount of legislation as the South but the emphasis of this region is completely different except in one area (i.e., oil and gas development). The consumer counsel legislation was the most frequent energy conservation legislation passed; it ranked fourth. However, the region ranks first in plant siting. The Great Plains ranked fourth in legislation regarding the office of the governor. Finally, resource utilization is quite low in contrast to other regions except for gas and oil development where it ties for third with the South. This may stem from the fact that three of the six states are exporters of energy.

The Southeast Coastal region in the United States proved active in the 1973-1978 period.[1] The region was quite active in the categories of energy conservation. It ranks second in the areas of public information and education for consumers, building codes and rate design. For energy management and conservation, the region ranked second in pooling, third in plant siting, and fourth in the categories of demand forecasting and load control. The Southeast Coastal region was less active in the area of organizational design; the region ranked fourth in both creation of state energy offices and extension of emergency powers for the governor. For resource utilization, the Southeast was active in a number of areas. The region ranked first in solar energy, third in resource recovery, second in gas and oil development and third in coal development. Thus, the Southeast coast has passed numerous legislative acts not just to conserve energy but to develop it as well.

Alaska and Hawaii were considered separately from the continental United States. Alaska, an energy exporter, will be compared to other exporting states. In like fashion Hawaii, an energy importer, will be compared to other importing states.

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[1] It should be noted that the percentages are based upon five states, while other regions typically have six or seven states.

The state of Alaska is similar to many energy exporting states in the pattern of energy legislation passed. First, like North Dakota, it has passed no energy conservation legislation, with the exception of rate design legislation. Also like North Dakota, Alaska has passed a great deal of pooling legislation for improved utility production efficiency. However, Alaska has not passed any legislation in the area of organizational design. This is an area in which energy exporters are not usually active. Finally, like Montana, and North Dakota, Alaska has passed legislation to encourage oil and gas development. In sum, Alaska is similar in many respects to the energy exporting, continental, states.

In contrast, Hawaii is much like the New England states which import energy and pass legislation that takes their situation into account. Unlike the New England states, Hawaii is warm all year, but it matches their record for attempting to develop solar energy. Hawaii's "importing" status helps explain why Hawaii, like the New England states, passed legislation in most aspects of conserving energy: consumer counsel, solar energy tax relief, building codes and rate design. In contrast, Hawaii has passed fewer bills in the area of energy management and conservation. Hawaii was active in the area of organizational design, giving its governor more powers to deal with the energy situation. Resource utilization, with the important exception of solar energy, is not an area where Hawaii is very active. Hawaii's lack of energy resources probably accounts for this trend. Thus, just as reserves for exporting energy seem to affect the type of legislation passed in Alaska, the lack of resources in Hawaii may also determine the kind of legislation it enacts.

Energy Trade Balance

Trends can also be assessed by an examination of the energy trade status of the states. Generally, a greater percentage of the thirty-nine net energy importing states was found to have bills enacted than was

the case in the twelve net energy exporting states. In the area of energy conservation practices, 69% of the importers participated in building code legislation as opposed to 33% of the exporters. Similarly, the importing group engaged in efforts to realize energy management and conservation to a greater extent than the exporting group. Twenty-five percent of the importers passed load control-related measures and 28% took action in the field of forecasting. The corresponding percentages for the exporters in these areas were 8% and 0% respectively. Finally, 30% of the importers passed legislation to achieve an increase in a governor's emergency power while only 16% of the exporters did so. These measures were classified under organizational design activities. In total, of the eleven sections encompassed in these chapters, the only instance the exporting group percentage exceeds that of the importing group is the activity of plant siting. It seems logical to conclude, then, that states forced to import energy sources appear to be taking greater efforts to manage and conserve those resources. This approach differs from the focus of energy legislation passed by the exporting group of states.

The development and recovery of resources appears more important to the net energy exporting states than the importing states in the effort to maximize energy resources. In contrast to the percentages found earlier, the exporting states are more active than the importing states in four of the six categories of activities. These include the development of solar energy, geothermal energy, the development of gas and oil, and resource recovery. While the level of involvement is generally lower for both groups of states in this area, it is still significant to note the reversal of order with regard to which group engages in the most activity.

While a discussion of the energy trade status with respect to the percentage of activity within a given area is important in order to isolate emergent trends in specific categories of activities such as resource utilization, it is necessary to expand the scope of the analysis

to determine the overall trend apparent in the aggregate. This objective is satisfied by examining the yearly and total percentages of legislation passed according to energy trade status.

Table 5B confirms that net energy importing states as a whole have been substantially more active in passing energy related legislation than the energy exporting states. Over the six-year period of this study, energy importing states were 2½ times more active than the other states (77.7% vs. 22.2%). However, if averages are calculated for individual state activity within the categories of importing and exporting states, a different picture emerges. In 1973 and 1974, individual states, whether they are net importers or exporters, were approximately equally active in passing new legislation. In 1975 and 1976, the individual importing states, on average, passed approximately one more piece of legislation each year, than did the exporting states. In 1977, this trend reversed itself, and net exporting states individually passed an average two more laws each than the net energy consuming states did. By 1978, the importing states were again more active. Overall, on an individual state basis, exporting states averaged 16.5 pieces of legislation throughout the period, while importers averaged 18.1 enactments over the same period. Although the importing states are more active, it is not by the same margin found when only aggregate totals are considered. On an individual state basis, energy trade status does not seem to indicate or explain differences in legislative activity.

From this data it appears that both energy exporting and importing states are interested in the enactment of energy legislation. The interests demonstrated by these two groups of states, however, are different. Net energy exporting states have overall enacted fewer pieces of legislation in all fields except plant siting. Net energy importing states, in contrast, dominate in most other issue categories.

Table 5B: Yearly and Total Number of Bills Passed According to Energy Trade Status

	Exporters (12)			Importers (38)		
	Total	Percent	Average Per State	Total	Percent	Average Per State
1973	7	23.3	.58	23	76.7	.60
1974	12	23.5	1.0	39	76.5	1.02
1975	27	18.0	2.25	123	22.0	3.2
1976	29	17.0	2.4	142	83.0	3.7
1977	111	24.3	9.25	268	76.7	7.05
1978	12	11.5	1.0	93	88.5	2.4
TOTALS	198	22.3	16.5	688	77.7	18.1

Source: Compiled by NRRI staff, see pg. 128.

Population

Specific trends are noticeable in the area of energy trade balance. Such trends can also be noted in about half the cases with the population variable. Before discussing patterns in the data, it should be noted that 7 of 18 (39%) states having populations under two million are exporters, 4 of 15 states (27%) between 2-4 million are exporters, no states having between 4-6 million are exporters, and only Texas is an exporter among states having populations greater than 6 million. Thus, net energy producing states tend to fall into the low state population categories.

The area of energy conservation has some interesting patterns that should be noted. States with larger populations are more likely to pass solar energy tax relief legislation and building code legislation than smaller states. Such trends may stem from the fact that lesser populated states are more likely to be energy exporting states, thus their need for such measures may not be as critical. Eighty-eight percent of the states with over six million people have passed

rate design legislation. This may be explained by the fact that most large states are net energy importers and have established a fairly complex state administrative mechanism capable of dealing with this issue. However, there is some question whether population size is the relevant variable determining interest in energy conservation.

Less definite patterns are apparent for energy management and conservation. Less populated states are more likely to pass "pooling" measures, although it is not clear why. No pattern at all is revealed for load control or plant siting bills. The most definite observation in this general area is a proportional relationship between amount of demand forecasting legislation passed and population size. There are a couple of possible reasons for this observation; one could be that larger states are better equipped to handle demand forecasting. Another reason that could be ventured is that states in need (i.e., importers) will tend to think demand forecasting is important as opposed to states that have an abundant energy resource. Thus, since most large states are energy importers, there is seemingly a relationship between highly populated states and planning and analysis of energy needs.

In the category of organizational design, the only discernible pattern revolved around legislation pertaining to the office of the governor. The smaller the state's population, the more legislation passed regarding the governor's power in energy matters.

In contrast, the patterns observed regarding resource utilization are quite clear. Legislation pertaining to solar energy, nuclear energy, and resource discovery tends to be most numerous in states with larger populations, while legislation directed at developing gas, oil, coal and geothermal resources is not concentrated in any population group. The dispersal of these latter activities across states may be the result of resource development being dependent upon the reserves native to a state, as opposed to state population. One can tell a great deal about a state's general strategy regarding energy by having a knowledge of

resource location and abundance in a given state. However, verification of whether population is a spurious variable in place of other factors requires further research.

It is evident that the conservation of energy has become a major focus of legislative activity since 1973. Several strategies have been adopted by states, covering a wide range of activities. Hopefully, this report has served to disseminate information concerning this activity and has identified the major trends displayed and the arenas in which states are entering. More important, however, is the degree to which this information has been able to stimulate interest in the area of conservation legislation. The area requires further study before conclusive statements can be made, but perhaps an understanding of the process as it is currently manifested across different states will help various legislatures develop an energy policy to meet their needs.

Some relationship does appear to exist between the amount and subject area of bills enacted with the regions of the country and a state or region's net energy importing or exporting status. Legislative involvement appears high, in general, and may well continue to stay high -- although this is clearly a matter requiring more research.

An assessment of the state legislation examined in this report indicates that while state regulatory commissions have been given added duties and responsibilities, other state agencies, notably the governors' offices and the state energy offices, have also received similarly expanded authorities and mandates. To the extent that the legislatively authorized subject matter appears as an issue in a state regulatory commission hearing, state agencies may well appear before the commission. This appearance may be marked by agreement or disagreement between the affected state agencies. What appears unchanged, however, is the state commission's responsibility to adjudicate these disputes under its legislatively mandated, and court-supported authority.

APPENDICES

APPENDIX A: STATE POPULATION

State	Population (Millions)			
	2	2-4	4-6	6
AL		X		
AK	X			
AZ		X		
AR		X		
CA				X
CO		X		
CT		X		
DE	X			
FL				X
GA			X	
HI	X			
ID	X			
IL				X
IN			X	
IA		X		
KS		X		
KY		X		
LA		X		
ME	X			
MD			X	
MA			X	
MI				X
MN		X		
MS		X		
MO			X	
MT	X			
NB	X			
NV	X			
NH	X			
NJ				X
NM	X			
NY				X
NC			X	
ND	X			
OH				X
OK		X		
OR		X		
PA				X
RI	X			
SC		X		
SD	X			
TN			X	
TX				X
UT	X			
VT	X			
VA			X	
WA		X		
WV	X			
WI			X	
WY	X			
DC	X			

Source: 1975 Population Reports by U.S. Bureau of Census

APPENDIX B: STATES BY REGION

MID-ATLANTIC

Delaware
Maryland
New Jersey
New York
Pennsylvania
Washington, D.C.
West Virginia

SOUTHEAST COASTAL

Florida
Georgia
North Carolina
South Carolina
Virginia

SOUTH

Alabama
Arkansas
Kentucky
Louisiana
Mississippi
Tennessee

MIDWESTERN

Illinois
Indiana
Iowa
Michigan
Minnesota
Ohio
Wisconsin

GREAT PLAINS

Idaho
Montana
Nebraska
North Dakota
South Dakota
Wyoming

SOUTHWESTERN

Colorado
Kansas
Missouri
New Mexico
Oklahoma
Texas

WEST

Arizona
California
Nevada
Oregon
Utah
Washington

NEW ENGLAND

Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

EXTERNAL

Alaska
Hawaii

APPENDIX C: ENERGY STATUS

State	Import	Export	Import/Export
AL	X		
AK		X	0.0003
AZ	X		7.3600
AR	X		47.1300
CA	X		
CO	X		26.5000
CT	X		276.7600
DE	X		155.0000
FL	X		
GL	X		
HI	X		
ID	X		15.3400
IL	X		6.8500
IN	X		
IA	X		
KS		X	0.1600
KY		X	0.1900
LA		X	0.0020
ME	X		172.6300
MD	X		
MA	X		
MI	X		
MN	X		
MS	X		
MO	X		81.6800
MT		X	0.0800
NB	X		1002.2000
NV	X		17.8300
NH	X		
NJ	X		
NM		X	1124.8000
NY	X		1124.8000
NC	X		
ND		X	0.3200
OH	X		
OK		X	
OR	X		
PA	X		3.9700
RI	X		
SC	X		45.6300
SD	X		1.1900
TN	X		
TX		X	0.0020
UT		X	0.7500
VT	X		35.2600
VA	X		1.5900
WA	X		11.3400

Source: Energy Flow Patterns for 1975. Joyce 1977, R.B. Kidman, R.J. Barrett, D.R. Koenig, Los Alamos Scientific Laboratory of the University.

PART V
FEDERAL LEGISLATIVE TRENDS[1]

[1]Prepared by Robert D. Poling, legal consultant. Robert D. Poling serves as a legislative attorney in the Congressional Research Service of the Library of Congress and is a member of the bars of the State of Ohio and of the District of Columbia. The views expressed are those of the author and not of the Library of Congress.

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INTRODUCTION

The purpose of this report is to examine the historical development of Federal and state regulation of electric and natural gas utilities, to identify and analyze recent Federal and state legislative and regulatory actions, and to analyze current legal and regulatory trends in the nature, scope and substance of Federal and state regulation of electric and natural gas utilities.

Few issues presently dominate public and private thinking more than energy issues, with the possible exception of the reformation of regulation by the Federal Bureaucracy.[1] But, with regard to the regulation of public utilities providing energy and power, these two issues have found common themes.

In less than a decade, energy issues have been propelled to the national forefront by a combination of events, each bearing on the others: increased public consumption of energy, continuing and unacceptably high rates of inflation, depletion of domestic energy resources, economic cartel decisions by the Organization of Petroleum Exporting Countries (OPEC), political problems inside foreign oil-producing countries, and many other events.

These events have already precipitated significant Federal and state actions relating to the production and consumption of energy. The process of rethinking traditional governmental policies and

regulation of electrical and natural gas utilities has already resulted in new approaches.

The creation of a single Federal cabinet-level Department of Energy in 1977 to consolidate Federal energy regulatory authority of separately constituted and diverse agencies under a single roof evidences the recognition on the Federal level of the need for better governmental institutional capability to provide leadership in Federal energy policy.[2] State regulatory agencies may well follow this Federal example in an effort to provide better regulatory devices to deal with emerging energy issues.

During the 95th Congress, major enactments of new Federal legislation focusing on the production, distribution, and consumption of natural gas and electricity, along with other Federal energy legislation, further reflects increased congressional response to issues that have been raised by both the public and industry over the availability, price and regulation of energy. The enactment of a five-part legislative program, known informally as the "National Energy Act" in November of 1978 constitutes a major Federal effort to embark upon a more coordinated scheme of energy policy for the nation.[3]

Although much of the administrative implementation under the newly-enacted Federal legislation is just now beginning, administrative and regulatory policy decisions are already being closely scrutinized by the energy industry, the public, state regulatory agencies, and the enactors of the legislation. Quite clearly, the administrative implementation of the new authority is expected to have a significant impact on the nation. But at the same time, it is becoming clear that even these legislative enactments cannot be regarded as the last Federal word on energy, for such a conclusion ignores both the evolutionary development of Federal regulation of energy-related industries and current events.

Recent rounds of OPEC price increases, presently raising the average price of imported crude oil to nearly sixteen dollars per barrel, with the additional scheduled increases set for later this year, have already had an impact on Federal policy. As was the case with his two immediate predecessors, President Carter has found that energy policy issues occupy a preeminent and enlarging position on the national agenda. In his recent address to the Congress on April 5, 1979, the call for further legislative and administrative policy actions was clear.

As significant actions both on the Federal and state levels continue to unfold new policies with respect to energy, it is appropriate to examine the historical development of the regulation of electricity and natural gas, as well as the current status of such regulation, for the purpose of assessing the direction and focus that will likely be given by the legislators and regulators to emerging and future issues.

This report will first examine the historical development and interpretation given to the Federal Power Act, the Natural Gas Act and other significant Federal legislation governing the electric and natural gas industries. A similar analysis with respect to state regulation will also be undertaken. The report will then focus on three major parts of the National Energy Act, as they relate to these utility industries for the purpose of identifying and summarizing their significant provisions.

Based upon this analysis, the report will attempt to identify current regulatory trends, with particular emphasis to be given to the jurisdictional relationship between state and Federal regulation of these industries.

THE FEDERAL POWER ACT

The technological development of generation and transmission capability in the electric industry early in this century, and the development of large-scale hydroelectric generating facilities transformed the electric power industry from a local and urban industry into an industry

generating and transmitting power in interstate commerce. The technological capability of the electric industry quickly swept beyond the regulatory reach of individual states.

A well-established legal doctrine under the Commerce Clause of the U.S. Constitution, Article I, Section 8, had already developed with respect to the scope of state and Federal jurisdiction. That doctrine, simply stated, was that the Commerce Clause vested the United States government with the exclusive authority to regulate matters of interstate commerce, and even in the absence of Federal regulation, states were limited to the regulation of intrastate matters.

This doctrine was applied to the interstate transmission of electricity in the landmark decision of the U.S. Supreme Court in Rhode Island Public Utilities Commission v. Attleboro Steam and Electric Co., in 1927.[4] There, the Court held that a state could not regulate the price charged for electricity generated in that state and sold in another. A state undertaking price regulation of electricity in interstate commerce would thus violate the Commerce Clause.

The inability of state regulation to set prices and establish the terms and conditions for sales of electricity in interstate commerce clearly established the need for Federal regulation, if there were to be any regulation at all of that aspect of the industry.

The enactment of the Federal Power Act[5] in 1935 constituted a significant effort to bring the interstate aspects of the industry under governmental regulation. The Act provided for the regulation of wholesales of electricity in interstate commerce.[6] These wholesales of electricity were made subject to "just and reasonable" rate regulation.[7] Service was to be made without discrimination,[8] and the obligation of providing adequate service was imposed.[9] In this respect, the regulatory format adopted for Federal regulation was predicated upon interstate jurisdiction and limited to wholesale transactions.

In addition, the Act authorized the Federal Power Commission to approve interconnection of facilities,[10] to regulate the sale, merger or other disposition of facilities,[11] and to authorize the issuance of securities by those jurisdictionally subject to the Act.[12]

Over the years, the interpretations of the Federal Power Act have raised a variety of legal issues with respect to the application of the Act to specific interstate transactions. For example, the process of "pooling" electrical energy for sales in interstate commerce has raised a series of legal issues concerning the actual tracing of electricity to its origin in order to determine whether the jurisdictional prerequisites for FPC regulation have been established.[13] While much of the routine operation of the Federal Power Commission involved the administrative development of "just and reasonable" rates of return calculated upon an administratively determined rate base, the fact that the Commission had broad latitude to administer its delegation from the Congress was legally clear.[14]

Following major power failures of the late 1960's, attention was focused at the Federal level toward reliability of power service.[15] The limitations of the Congressional delegation to the FPC with respect to interconnection of utilities were acknowledged, and issues were raised as to the propriety of authorizing new powers to mandate interconnection, sale of power, and wheeling of power by the FPC.[16] One solution considered to meet the need for greater power reliability was the concept of a national power grid.[17]

Although it might be observed that the Federal Power Commission was vested with broad powers to carry on Federal regulation, these powers were initially provided, and indeed exercised, in a manner consistent with perceived necessity of filling the jurisdictional legal gap created by judicial interpretation of the limits of state authority.

THE NATURAL GAS ACT

In many ways the Federal regulation of natural gas sold in interstate commerce arose out of similar legal circumstances to those of electricity. However, the development of natural gas regulation has involved significantly more difficult jurisdictional issues primarily owing to the nature of natural gas. Unlike electricity, which owes its generation to energy sources, natural gas is a form of energy itself. Therein lies an important distinction between the form of Federal regulation of the two industries.

Prior to the enactment of the Natural Gas Act of 1938,[18] the interstate regulation of the transportation of natural gas was virtually unregulated. Regulation that did exist was carried on by the states in the form of conservation, production, transportation and retail distribution regulation.[19]

Federal issues relating to natural gas began to emerge with its significant production. As early as 1900, the U.S. Supreme Court upheld the right of states to carry on conservation regulation of natural gas.[20] However, it was also recognized quite early that state restrictions prohibiting the transportation of natural gas in interstate commerce wrongly interfered with interstate commerce in violation of the Commerce Clause.[21]

Thus, consistent with applicable Supreme Court precedent governing the interstate transportation of oil,[22] the Supreme Court held that certain state taxation of natural gas in interstate commerce was void under the Commerce Clause.[23] Similarly, states could not establish a preferential obligation requiring priority usage of natural gas in the state of production, thereby withdrawing gas from interstate commerce.[24] Although the Supreme Court was willing to recognize the need for some state regulation for conservation purposes,[25] it was unwilling to permit state regulation of the sale, transportation, and delivery of natural gas

in interstate commerce.[26] State efforts to set prices in interstate commerce, even in the absence of Federal regulation, intruded upon the powers vested under the Commerce Clause with Congress.[27]

As with electricity, the legal inability of the states to regulate interstate aspects of the industry led to Federal regulation. The Natural Gas Act of 1938 provided for the regulation of rates and charges for the interstate sale for resale of natural gas. The Federal Power Commission was authorized to establish "just and reasonable" rates for gas gransportation[28] based upon the fair value of the property used for transportation,[29] and to regulate the entry and abandonment of service[30] in interstate markets, among other things.

Following the enactment of the Natural Gas Act, a body of significant administrative and judicial decisions interpreting the Act became the basis of the Federal regulation of natural gas for over forty years. One of the first judicial issues to reach the U.S. Supreme Court involved the relationship of the authority under the Act to state authority. As an indication of the general interpretations to follow, the Court held that companies subject to the Act could not be required by states to extend facilities and provide service in an area already served by another natural gas company subject to the Act.[31]

But the first major constitutional decision under the Act came in 1942 as the result of a rate proceeding in Federal Power Commission v. Natural Gas Pipeline,[32] in which the Court upheld the constitutionality of the Natural Gas Act as within the power under the Commerce Clause and found that the Act did not violate the Fifth Amendment due process provisions. The decision had the effect of sustaining the broad authority of the Commission's discretion to establish "just and reasonable" rates, so long as such rates were not confiscatory by upholding the Commission's finding that a six and one-half percent rate of return on fair value was adequate.

It was also quickly established under the Act that the states were unable to set the rates at which the local utilities would pay for natural gas purchased from interstate companies subject to the Act,[33] and that the jurisdiction of the FPC was that which had been beyond the reach of state commissions prior to the Act.[34]

However, state jurisdiction with respect to retail sales was preserved, since the Act only applied to sales for resale in interstate commerce. Thus, state regulation could require certificates from interstate pipelines selling natural gas directly to industrial customers.[35]

In Federal Power Commission v. Hope Natural Gas Co.,[36] the Supreme Court upheld the rate methodology adopted by the FPC in approving the use of the rate base, upon which the "just and reasonable" rates were calculated, as including a company's "actual legitimate cost" of interstate property, less depreciation and depletion, plus allowances for unoperated acreage, working capital, and future net capital additions.

But the most significant judicial decision with respect to FPC jurisdiction came in 1954 in Phillips Petroleum Co. v. Wisconsin.[37] The decision held that independent producers of natural gas not actually shipping gas over their own lines, but who sold gas to interstate pipeline companies, were natural gas companies within the meaning of the Act, and therefore subject to rate regulation by the Commission. Thereafter, the Commission undertook the price regulation at the wellhead of natural gas subject to the Act.[38] The difficulties of determining on a company basis the cost-of-service for each independent producer became an unworkable burden for the FPC and inevitably led to the area basis of establishing price levels in 1963.[39]

And by 1968, the FPC was finally upheld in its establishment of a two-tier price structure for area pricing of natural gas.[40]

But, by the early 1970's the problem of increasing importance for the Commission had become the shortages of supplies of interstate gas and the need for the development of curtailment procedures to be used by companies with inadequate supplies to meet contractural needs.[41]

Following a long series of administrative hearings and a series of incremental efforts to solve the problems, the FPC finally undertook to resolve the shortages of natural gas through the imposition of mandatory curtailment plans adopted for each individual pipeline. These curtailment plans typically imposed a system of priorities for various natural gas retail customers based upon the nature of the use to which such customer made of the gas. Residential customers were generally given the highest priorities, followed by various commercial and public uses, with boiler fuel and interruptible customers in the lowest priority category.[42]

But even these curtailment measures were inadequate in providing for allocation among pipelines, for they were designed to allocate among a given pipeline's customers and were not intended to require similar curtailment for each pipeline. At the same time actions were taken to provide incentives for producers to provide additional gas in interstate commerce. Various short-term sales for natural gas were approved in a manner that would not subject the gas to rate and other FPC jurisdiction, and the Commission approved certain direct sales of natural gas at unregulated prices.[43]

By the end of the 1976-77 winter, the Congress perceived the need for additional authority to alleviate potentially disruptive national shortages of natural gas.[44] The Emergency Natural Gas Act of 1977[45] provided supplemental authority in the form of a direct delegation of emergency powers to the President. Among other things, the Act authorized the President to declare an emergency triggering various provisions permitting the acquisition of intrastate natural gas, previously beyond the Federal reach.[46] The effect of the Act was to provide authority to reach supplies of natural gas, including certain intrastate gas, to meet emergency needs beyond the ability of a single interstate pipe-

line to provide through curtailment procedures. The Act, therefore, potentially constituted, by its express terms,[47] a significant preemption of state regulation of natural gas. Although the Act's authority expired on August 1, 1977 without the declaration of an emergency, the Act evidenced a Congressional willingness to substantially expand the scope of Federal jurisdiction over natural gas production and delivery, even if only in emergency circumstances.

RELATED FEDERAL LAWS

While the Federal Power Act and the Natural Gas Act have served as the principal Federal statutory enactments governing electricity and natural gas for over forty years, other Federal statutory enactments of both direct and indirect application have also governed significant aspects of electric and gas utilities. The licensing functions for electrical generation uses of atomic energy now carried on the Nuclear Regulatory Commission under the Atomic Energy Act of 1954, as amended,[48] have provided an important alternative energy source for electric utilities now providing the capability of generating upwards of twelve percent of domestic electricity. Although the licensing authority over nuclear plants was primarily intended to be of a technical nature, while relying upon state and Federal regulation of the rates and charges for nuclear generated power, the impact of licensing facilities on both Federal and state regulation has been significant.

Other Federal legislation has related to electric and natural gas utilities indirectly. The National Environmental Policy Act of 1969[49] has been an important consideration in Federal actions relating to siting decisions for nuclear facilities,[50] construction of high-voltage transmission lines, construction of natural gas piprlines and other related utility activities for which the evaluation of the environmental impace is required. In short, environmental considerations have had, and will continue to have, a considerable role in the Federal decision-making process, although the recent Supreme Court decision in Vermont Yankee[51] has

been viewed by many as a relaxation of the procedural requirements imposed as part of the nuclear licensing process. The recent difficulties at the Three Mile Island nuclear generating facility near Harrisburg, Pennsylvania has intensified the public discussion of environmental and safety aspects of nuclear power plants.

In addition to the National Environmental Policy Act, other Federal environmental legislation such as the Clean Air Act[52] have also become important factors in both private and public decision-making relating to utilities. The emphasis of the Clean Air Act in mandating stringent air quality emissions standards has had the effect of limiting fuel alternatives, by requiring the installation of pollution control devices or the shift toward cleaner fossil fuels.

Beyond environmental laws, other Federal laws of general application have indirectly affected electric and gas utilities. Antitrust laws have been, and continue to be, an important factor in many policy and planning decisions by utilities.[53] In some cases, the application of antitrust laws to the industry has produced somewhat curious results. While the authority of the Federal Power Commission to order wheeling of power under the Federal Power Act was lacking, the Sherman Act, with its limitations on monopolistic practices, provided an ability to require wheeling in certain instances.[54]

Finally, it might be noted briefly that Federal tax law, securities law, and other Federal statutes touch upon the electric and gas utility industry. The brevity of treatment here of Federal laws, other than the Natural Gas Act and the Federal Power Act, is not intended to suggest that a lack of importance should be attached to these Federal laws, for certainly in their own specific spheres each has had significance to the industry. Rather, the point to be made here is that the major Federal enactments governing the economic aspects of the industry (the Gas Act and the Power Act) were subjected to an evolutionary development through interpretation, administrative application, and expansion over a forty-

year period without significant modification as regulatory devices by the Congress. Federal regulation of non-economic aspects of the industry has occurred only relatively recently. Health and safety regulation under Federal environmental laws, for example, occurred in the early 1970's.

The point of departure from the traditional Federal economic regulation was signalled as early as 1975, a date to be discussed later as the beginning of a new regulatory approach on the Federal level.

Before turning to that approach, however, it is appropriate to provide some analysis of state regulation of electric and gas utilities.

STATE REGULATION

The analysis of state law governing natural gas and electric utilities involves more than simply the delineation of the jurisdictional zone of state regulation. Not only does state regulation of these utilities pre-date Federal regulation, as has been demonstrated above, but state regulation served as the fundamental model for the establishment and nature of Federal regulation.

The historical role of states in the almost exclusive regulation of real property and corporate enterprise provided a natural beginning for the establishment of the regulation of the electrical and natural gas industries. Although the regulation of the two utilities has many similarities, the origins of regulation of the two are very different, and for that reason each will be considered separately.

State regulation of natural gas developed initially as an adjunct of the regulation of the petroleum production industry. The first state laws relating to oil and natural gas production are traceable to an 1878 Pennsylvania statute enacted for the purpose of conserving those vital commodities through the prevention of production waste by requiring the

plugging and casing of wells.[55] The rapid development of oil and gas fields in California, Oklahoma and Texas in the 1920's led many producing states to enact laws providing for the orderly production and conservation of oil and natural gas to both prevent waste and to assure stable markets for products.[56]

In addition to conservation and orderly production regulation, producing states quickly developed the need for new regulatory approaches to resolve the legal conflicts arising from the respective rights of adjacent landowners to oil and gas pools beneath the surface. Thus, the establishment of state regulatory mechanisms also provided for the regulation of the correlative rights of surface owners by establishing rules governing production and recovery techniques.[57] As has already been noted, the U.S. Supreme Court upheld state conservation laws relating to the production of natural gas as early as 1900.[58] In 1935, the U.S. Congress gave its approval to the Interstate Oil Compact,[59] under which producing states voluntarily obligated themselves to undertake regulation to prevent the waste in production of natural gas through the prevention of inefficient techniques.[60] This form of state regulation continues today[61] and has been given Federal judicial approval in cases upholding the rights of states to limit and prorate production of natural gas.[62]

The distribution and sale of natural gas was also a matter initially within state regulatory domain through the general regulatory powers of the state with respect to the franchising of corporations. State regulation of natural gas distribution companies arose out of the need to accommodate capital investment by providing special rights to service areas. The granting of such corporate rights was offset by requiring of such companies obligations of service and imposing rate regulation. In this respect, electric and natural gas retail distribution regulation have many similarities.

Both types of enterprise were generally regulated by the states through the granting of certificates of public convenience and necessity,

which granted exclusive rights to service areas and often required rate regulation in exchange for the right to do business.[63]

Although as has been indicated above, the regulation of rates for both natural gas and electricity in interstate commerce was declared by the courts to intrude upon Federal prerogatives under the Commerce Clause and eventually wholesale rate in interstate commerce were governed by Federal legislation, initially states undertook broad regulation of rates over gas and electricity themselves. Under this early rate regulation, the courts upheld state regulation of rates providing for "fair return upon the value" of the property employed in the enterprise.[64] Based upon early court approval of state rate regulation, and a long series of later judicial decisions bearing upon the method of calculation of rates,[65] states continue to exercise, as a principal form of regulation, broad powers to establish the rates and charges made by electric and natural gas retail distribution utilities.[66]

Because the sovereignty of each state provides it with the jurisdictional ability to establish and conduct regulation in the manner it deems most appropriate for itself, uniformities among states on specific aspects of utility are often lacking, and it is frequently difficult to generalize about state regulation, except in the broadest of terms.

One point, however, deserves special attention. The historical development of state and Federal regulation has had the effect of placing the state regulatory authorities indirectly, and the utilities directly, in the position of primary responsibility for: 1) assessing future public needs for both natural gas and electricity; 2) planning for construction of physical utility facilities; and 3) determining alternative sources of energy to be used in meeting retail energy demands. To a significant extent, the Federal authority has until recently acted as a mechanism responsive to initiatives for utility actions presented to it, rather than acting as a central Federal planning authority.

For this reason, it is little wonder that the traditional principal functions of state regulatory agencies with respect to assuring returns on investments of electric and gas utilities at reasonable rates have been undergoing a period of much closer public and regulatory scrutiny since the middle 1960's as the consequence of increased energy costs.

By the early 1970's the increased construction costs resulting from inflation, increased energy costs and increased costs of capital acquisition led electrical utilities to seek a mechanism so that with respect to each set of increases due to energy costs, approval from the state regulatory authority would not be necessary. The solution was approval of automatic fuel adjustment clauses in tariffs submitted to the State regulatory agency. These clauses would allow a direct pass-through of fuel acquisition costs to retail cusotmers without specific approval for each rate hike. Many states adopted such a system of fuel adjustment clauses,[68] which became almost immediately quite controversial.[69]

Other state ratemaking techniques were adopted, such as the inclusion of uncompleted facilities in the rate base of the utility prior to their actual usefulness in an electrical generation system. Known as "construction work in progress" this rate technique was primarily conceived as a means of providing additional capital to finance the increasing costs of new generating facilities.

These rate devices--the fuel adjustment clause, and construction work in progress, along with other new rate techniques adopted by the states--caused major controversies.[70] However effective these rate techniques were in reaching their intended results, the fact remains that the use of these rate devices by states followed the traditional form of state regulation--retail rate regulation.

Thus, it might be said that, with the possible exception of limited state regulation of production conservation laws, the form of regulation of natural gas and electric utilities by both the Federal and state govern-

ments was primarily rate regulation. Admittedly, utilities were subjected to licensing requirements and other obligations, but so were other forms of corporate enterprise.

This traditional form of regulation has recently undergone significant change at the Federal level through the enactment of the so-called National Energy Act.

RECENT FEDERAL LEGISLATION

The enactment of the five-part National Energy Act in November of 1978[71] marks a significant new Federal venture into the regulation of electric and gas utilities. This venture may be characterized as a departure from the traditional regulation of these utilities through its declaration of objectives for a comprehensive national energy policy. Beyond its efforts to expand the regulatory reach of both the subject of private decision-making, the legislation signals the emergence of a new regulatory relationship between Federal and state governments.

The origin of this new Federal concept of coordinated energy policy is properly traceable to 1975 and the enactment of the Energy Policy and Conservation Act.[72] That Act provided authorization for Federal energy conservation programs and regulation covering many major and diverse uses of energy, including uses of energy provided by gas and electric utilities. The programatic authorization of the legislation provided for Federal assistance, study and evaluation of the development of state energy conservation programs.[73]

The new authorization for direct Federal regulatory action included broad powers for the establishment of energy conservation contingency plans.[74] These powers, for example, provided a kind of temporary and short-term Federal ability to address specific conservation objectives during periods of special conservation need. Recent Department of Energy actions to provide a conservation plan relating to emergency building

temporary restrictions, although limited in application and duration, constitute a significant new Federal effort to address the end-use consumption of energy provided by public utilities.[75]

The National Energy Act of 1978, however, constitutes an even more significant definition of national energy policy by authorizing direct regulatory actions substantially exceeding the limited authorization of the Energy Policy and Conservation Act.

As one component of the National Energy Act, the Public Utility Regulatory Policy Act (PURPA)[76] undertakes a broad new regulatory and programmatic scheme of regulation at both Federal and state levels over natural gas and electric utilities. While several aspects of the Act may be viewed as an expansion of Federal regulatory authority into zones previously cognizable under state law, an overview of the Act indicates that in many respects it is designed to bridge the jurisdictional lines drawn between Federal and state jurisdiction for the purpose of directly addressing energy issues in a more effective and coordinated regulation of utilities.

Title I of the Act sets out new retail policy objectives for electrical utilities. Moving into this traditional area of state regulatory jurisdiction, the Act imposes an affirmative obligation on state regulatory authorities to undertake an examination within two years, and to complete an evaluation within three years, of a series of Federal rate-making standards. Although the specified Federal standards are not obligatory on the states, the states are obligated to report to the Secretary of Energy periodically on the status of the consideration of the standards.[77]

The standards set forth in the Act include such matters as prohibiting master metering of electric service for newly constructed buildings, monitoring automatic fuel adjustment clauses to assure incentives for resource conservation, utilizing declining block rates for electricity, using sea-

sonal costs, providing time-of-day pricing more reflective of costs, offering interruptible rates to industrial and commercial consumers reflective of the costs of such service, and implementing load management techniques for the purpose of reducing kilowatt demand in order to achieve long run cost savings.[78]

The standards also acknowledge the need to provide or continue life-line rate procedures and consumer safeguards in the termination of service to afford protection where health dangers might arise.[79]

Other aspects of state rate-making are also set forth under the new Act, including standards prohibiting the use of rate payer revenues for certain promotional and political advertising.

In effect, the adoption of these "standards" is voluntary on the part of the states. However, the Act does require that these "standards" be considered by the states and that determinations with respect to their implementation be made in writing after a required public hearing on the issues. Under the Act, the hearing must be conducted in a manner assuring the ability of consumers, the utility, and representatives of the U.S. Department of Energy to participate.[80]

Consumer representatives must be directly compensated by the utilities or consumer representation may be provided by the state agency in some alternative method.[81]

With respect to retail policies of utilities in the sale of natural gas, Title III of PURPA imposes a process of evaluation similar to that required in connection with retail electric sales. Retail natural gas rate design evaluations are required with respect to such matters as incremental pricing, marginal cost pricing, and end-user consumption. Provisions are also included with respect to termination of natural gas service to retail customers and with respect to prohibitions against advertising by natural gas utilities for promotional and political purposes.

In short, PURPA mandates an across-the-board evaluation by each state of its retail electricity and natural gas rate structure. In order to provide at least some funding for these required state proceedings, PURPA authorizes Federal assistance to state agencies.[82]

One of the legal issues raised by the required conduct of these rate standard proceedings is whether such an obligation may be imposed upon the states. It appears that this issue has already been raised in one of the first legal challenges to PURPA by the state of Mississippi. In a suit brought against the Federal Energy Regulatory Commission and the Secretary of Energy, Mississippi has argued that PURPA had unconstitutionally pre-empted state regulatory responsibilities for rate-making of electrical and natural gas utilities in contravention of the sovereign rights of the state.[83] In addition, the suit argues that the Act places an intolerable burden of time and money on the state.

Quite obviously the outcome of this pending litigation could have a significant effect on the status of PURPA and the obligations it imposes on the states, by more precisely delineating Federal and state jurisdiction over utilities. While Commerce Clause cases have long provided for broad Federal powers, even to the extent of permitting Federal regulation of intrastate matters affecting interstate commerce, recent court decisions have acknowledge limits to the permissible Federal preemption of traditional state regulation.[84] Even though direct Federal regulation of utility retail rates may be permissible, separate or concurrent state regulation may also continue.

In addition to the mandated rate evaluations, PURPA significantly expands Federal authority under the Federal Power Act. The Federal Energy Regulatory Commission, successor to the Federal Power Commission and an independent regulatory agency located organizationally within the Department of Energy, has three new major powers over electric utilities: 1) procedures are established authorizing the Commission to require interconnection of certain electrical generation and transmission facilities, including co-

generation facilities,[85] 2) authorization is provided for the mandatory sale and exchange of electricity,[86] and 3) authorization is provided for the mandatory wheeling of power across certain intermediary facilities between a supplying utility and a wholesale purchaser.[87]

These new Federal authorizations do much to provide for the ability to achieve greater coordination of electrical generation and transmission facilities for the purposes of encouraging conserving of energy, improving reliability of service, and improving the efficient use of facilities and conservation of resources, including capital resources.[88] The new PURPA authorization does much to clarify the emergency interconnection authority formerly exercised by the Federal Power Commission, and also provides adequate authority for initial steps in a more integrated electrical power industry, such as that urged by advocates of a national power grid.

Under PURPA, FERC is also directed to undertake its own evaluation of automatic fuel adjustment clauses utilized in retail rate-making and to undertake an evaluation of rate regulation similar to that required of the states.[89] Reliability of service studies, including a review of utility investment decisions and conservation policies, are required,[90] and new authority is provided for the regulation of co-generation and small power production facilities.[91] All these provisions quite obviously make PURPA a most significant piece of Federal legislation. The exercise of authority under PURPA, the responsiveness of states to the mandated studies, and the interpretation and administration of the Act will be very important factors in the operation of electric and natural gas utilities in the 1980's.

Another component of the National Energy Act is the Powerplant and Industrial Fuel Use Act.[92] The general purpose of the Act is to reduce the consumption of petroleum and natural gas for industrial and electric powerplant uses through requirements of conversion to alternative fuels, principally coal and nuclear fuels.[93] The Act imposes obligations in connection with the construction of new powerplants and industrial requirements for existing facilities, with the objective of significantly

reducing over time the use of petroleum and natural gas for these purposes.[94]

Proposed administrative regulations are already being considered which would establish both 1) the procedural process of examining existing facilities and approving new facilities, and 2) the substantive criteria governing the administration of the Act.[95]

While the impact of the Act is likely to be realized in the long range future, its significance lies in the fact that it is the first major Federal venture into fuel use policies in the generation of electricity and for industrial purposes.

A third comment of the National Energy Act is the Natural Gas Policy Act of 1978.[96] This Act constitutes a major new Federal policy of regulation of the prices of natural gas at the wellhead. The Act provides for a complicated system of price regulation for natural gas based upon several statutorily specified and defined categories of natural gas, including such categories as new natural gas produced from the Outer Continental Shelf, new onshore gas, gas currently dedicated to interstate commerce, existing intrastate gas under contract, gas sold under rollover contracts, and various other categories.[97]

The effect of his complicated scheme of gas categorization is to fix the current price and to provide periodic price increases in accordance with formulated ceiling prices subject to inflation adjustments, depending upon the category of natural gas involved. The Act's object is to achieve certain rate deregulation for significant categories of natural gas by January 1, 1985. Because of the complex nature and the administrative burden of ascertaining the category for particular natural gas, Congress chose to authorize the delegation of the initial determination of gas category to state regulatory commissions, subject to possible review by the Federal Energy Regulatory Commission.[98] The state determination of gas category will have the effect of automatically applying the established gas prices set by FERC in accordance with the price ceiling provisions.

This cooperative undertaking involving state determination and Federal establishment of prices has the effect of eliminating the need for extensive enforcement and monitoring staff and organization at the Federal level, while providing for an important new state role in natural gas price regulation. The Federal Energy Regulatory Commission has already promulgated regulations implementing the Act,[99] including the delegation of functions to the state regulatory agencies.[100]

While the delegation of regulatory functions to the states is not without precedent,[101] it appears to be a novel approach in the Federal regulation of natural gas.

Another significant aspect of the Natural Gas Act of 1978 is that the Act provides for the reauthorization of emergency natural gas powers similar to the expired authority which was provided under the Emergency Natural Gas Act.[102] Thus, permanent authority has now been established for use during emergency shortages to provide the ability to regulate production and delivery of gas supplies.[103]

For the first time as an express statutory authorization, the Act establishes specific natural gas curtailment procedures with specified Federal end-use priorities.[104]

State rate-making authority has been restricted to some extent through the provisions permitting Federal rate regulation of certain natural gas previously governed by state jurisdiction.[105]

The new Federal rate structure under the Act will have an obvious effect of increasing prices to retail customers of natural gas shipped in interstate commerce through the gradual relaxation of current price limitations. Although not the subject of analysis here, the other component Acts of the National Energy Act also have numerous direct and indirect effect on electric and natural gas utilities.

The impact of the entire National Energy Act on state regulation of gas and electric utilities is most substantial. The implementation of mandated requirements, the establishment of procedural rules, and the development of substantive forms of new regulation by state agencies will likely focus new industry and public attention on the state regulatory process. It is likely that state agencies will need increases in personnel and funding to comply with the new law. But more significantly, the new Act has the effect of designating state regulatory agencies as the initial forum for the resolution of emerging utility issues. To a very large degree, state agencies now have the opportunity to construct for themselves a new role with respect to the traditional Federal and state jurisdiction over these utilities. It is fair to assume that, at least in part, Congress provided this opportunity in recognition of the undesirability of further expanding the Federal bureaucracy and in recognition of an existing state regulatory mechanism which might be more responsive to local needs within the umbrella of Federal energy policy.

CONCLUSION

In the recent Supreme Court decision Hughes v. Oklahoma,[106] the Federal power to regulate commerce as described by Justice McKenna sixty-eight years ago in West v. Kansas Natural Gas Company,[107] was cited with approval. Justice McKenna's description is not only pertinent to many emerging legal issues relating to the Federal regulation of gas and electric utilities, but it has a particular significance as more attention is focused on the importance of energy conservation as an element of utility regulation:

> If the states have such power (to intrude upon matters of interstate commerce), a singular situation might result. Pennsylvania might keep its coal, the Northwest its timber, the mining states their minerals.

> And why not the products of the field be brought within the principle? Thus enlarged, or without that enlargement, its influence on interstate commerce need not be pointed out. To what consequences does such power tend? If one state has it, all states have it: embargo may be retaliated by embargo, and commerce will be halted at state lines. And yet we have said that "in matters of foreign and interstate commerce there shall be no state lines."[108]

It, therefore, seems clear that the allocation of energy resources is an important Federal matter. But it is also an important state matter, for the mere existence of Federal legal power to undertake regulation of matters that have been historically regulated by states does not necessarily argue for the exercise of that power. Yet, the actions of state regulatory agencies under state law have a significant impact on national policy.

Consumer uses of electricity and natural gas quite obviously have an enormous role in defining national energy needs. But prior to 1975, both Federal and state regulatory efforts were not significantly devoted to the examination of the relationship of retail rate structure to the consumption of electricity and natural gas. Federal policy providing new and specific direction to states under the National Energy Act now undertakes a full assessment of that relationship.

The outcome of mandated review by states of retail rate policies for electric and gas utilities may chart the future delineation between Federal and state regulation of retail rate practices.

There is, as has been observed, an important deference given under the National Energy Act to state regulatory capabilities. In many new ways, Federal actions appear to be relying upon state participation in the decision-making process, as with the categorization of natural gas.

The national declaration of conservation of energy as a goal signals an important departure from past forms of regulation. Although final regulatory policies have not been specifically decided, the current public review may be characterized as an important beginning in the search for solutions.

It is quite likely that both Federal and state regulatory policy will, as the consequence of closer examination, undergo experimental modifications and incremental adjustments. Many new regulatory approaches will be tried and evaluated: some accepted, some rejected.

An important issue that will undoubtedly surface is the matter of jurisdictional delineation of responsibilities for very specific regulatory actions between the Federal and state governments. This delineation of responsibility may lead to the emergence of a new relationship between the Federal and state governments.

FOOTNOTES

1. President Carter recently sent a regulatory reform message and bill to the Congress. The Administration's bill, S. 755 has been introduced and hearings before the Senate Committee on Governmental Affairs are currently considering the bill, along with S. 262, the Ribicoff-Percy regulatory reform proposal, and several others. Among other things, the bills would substantially revise the procedures used by major Federal regulatory agencies in the conduct of rule-making, adjudication, and other agency activities.

2. See, The Department of Energy Organization Act, Public Law 95-91, 91 Stat. 565 (August 4, 1977). See also, Department of Energy Organization Act, Hearings before the Senate Committee on Governmental Affairs, 95th Cong., 1st Sess. (1977); and, Department of Energy Organization Act, Hearings before the Subcommittee on Energy and Power of the House Commerce Committee, 95th Cong., 1st Sess. (1977).

3. "The National Energy Act" is actually composed of five separate Acts of Congress: 1) The Public Utility Regulatory Policies Act of 1978, Public Law 95-617, 92 Stat. 3117 (1978); 2) The Energy Tax Act of 1978, Public Law 95-618, 92 Stat. 3174 (1978); 3) The National Energy Conservation Policy Act, Public Law 95-619, 92 Stat. 3206 (1978); 4) The Powerplant and Industrial Fuel Use Act of 1978, Public Law 95-620, 92 Stat. 3289 (1978); and, 5) The Natural Gas Policy Act of 1978 Public Law 95-621, 92 Stat. 3350 (1978).

4. 273 U.S. 83 (1927).

5. 16 U.S. Code Section 824 et seq.

6. 16 U.S. Code Section 824.

7. 16 U.S. Code Section 824e.

8. Id.

9. 16 U.S. Code Section 824f.

10. 16 U.S. Code Section 824a.

11. 16 U.S. Code Section 824b.

12. 16 U.S. Code Section 824c.

13. See for example, Arkansas Power & Light Co. v. Federal Power Commission, 368 F. 2d 276 (8th Cir. 1966); Cincinnati Gas & Electric Co. v. Federal Power Commission, 376 F. 2d 506 (5th Cir. 1967), cert. denied 389 U.S.

842; Public Service Co. of Indiana, Inc. v. Federal Power Commission, 375 F. 2d 100 (7th Cir. 1967), cert. denied 387 U.S. 931; and Federal Power Commission v. Southern California Edison Co., 376 U.S. 205 (1974). See also _____, "Public Utilities Regulation--Jurisdiction of the Federal Power Commission: Factual Determination of Interstate Flow Required," 46 Washington Law Review 837 (1971).

14. See generally, Connecticut Light & Power Co. v. Federal Power Commission, 324 U.S. (1945); Federal Power Commission v. Florida Power & Light Co., 404 U.S. 453 (1972).

15. Electric Power Reliability--1969--1970, Hearings before the Subcommittee on Communications and Power of the House Committee on Interstate and Foreign Commerce, 91st Cong., 1st and 2d Sess. (1969-1970).

16. _____, "Electric-Utility Interconnections: Power to the People," 21 Stanford Law Review 1714 (1969); _____," Blackout of Interconnected Electric Companies: Recovery and Preventive Measures," 53 Minnesota Law Review 162 (1968); and S. Breyer and P.W. MacAvoy, "Federal Power Commission and the Coordination Problem in the Electrical Power Industry," 46 Southern California Law Review 661 (1973).

17. Committee Print, "National Power Grid System Study--An Overview of Economics, Regulatory, and Engineering Aspects," Subcommittee on Mineral, Materials and Fuels of the Senate Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

18. 15 U.S. Code Section 717 et seq.

19. See Legal History of Conservation of Oil and Gas, A symposium published by the Section of Mineral Law of the American Bar Association (1938).

20. Ohio Oil Company v. Indiana (No. 1), 177 U.S. 190 (1900).

21. West v. Kansas Natural Gas Company, 221 U.S. 229 (1911).

22. Eureka Pipe Line Co., v. Hallahan, 257 U.S. 265 (1921).

23. United Fuel Gas Co. v. Hallahan, 257, U.S. 277 (1921).

24. Pennsylvania v. West Virginia, 262 U.S. 553 (1923).

25. Bandini Co. v. Superior Court, 284 U.S. 8 (1931).

26. Missouri v. Kansas Natural Gas Co., 265 U.S. 298 (1924).

27. State Corporation Commission of Kansas v. Wichita Gas Co., 290 U.S. 551 (1934).

28. See, Sections 4 and 5 of the Natural Gas Act, Public Law 75-688, 52 Stat. 821 (1938).

29. Ibid., Section 6.

30. Ibid., Section 7.

31. Illinois Natural Gas Co. v. Central Illinois Service Co., 314 U.S. 498 (1942).

32. 315 U.S. 575 (1942).

33. Public Utilities Commission of Ohio v. United Fuel Co., 317 U.S. 456 (1943).

34. Panhandle Eastern Pipe Line Co. v. Public Service Commission, 332 U.S. 507 (1947).

35. Panhandle Eastern Pipe Line Co. v. Michigan Public Service Commission, 341 U.S. 329 (1951).

36. 320 U.S. 591 (1944).

37. 347 U.S. 672 (1954).

38. Committee Print, "The Economics of the Natural Gas Controversy," Sub committee on Energy of the Joint Economic Committee, U.S. Congress 95th Cong., 1st Sess. (1977), at p. 6; see also, The Field Price Regulation of Natural Gas, by Clark A. Hawkins (Florida State University Press, Tallahassee) 1969; Natural Gas Regulation--An Evaluation of FPC Price Controls, by Robert B. Helms (American Enterprise Institute for Public Policy Research, Washington, D.C.) 1974; and, The Federal Power Commission, Course Handbook Series Number 133, (Practicing Law Institute, New York) 1974.

39. Wisconsin v. Federal Power Commission, 373 U.S. 294 (1963).

40. Permian Basin Area Rate Cases, 390 U.S. 747 (1968).

41. See, for example, Federal Power Commission v. Louisiana Power & Light Co., 406 U.S. 621 (1972).

42. See, FPC Order 476-B End Use Curtailment Plan; see also, Consolidated Edison Company of New York, Inc. v. Federal Power Commission, 512 F. 2d 1332 (D.C. Cir. 1975).

43. See, FPC Order 533.

44. See, Natural Gas Shortages, Hearings before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 94th Cong., 1st Sess. (1975).

45. Public Law 95-2, 91 Stat. 4 (February 2, 1977).

46. Id., Section 6 (a).

47. Id., Section 14

48. 42 U.S. Code Section 2051 et seq.

49. National Environmental Policy Act of 1969, Public Law 91-190 (1970), as amended.

50. See, Calvert Cliffs' Coordinating Committee Inc. v. U.S. Atomic Energy Commission, 449 F. 2d 1109 (D.C. Cir. 1971); and Calvert Cliffs Court Decision, Hearing before the Senate Committee on Interior and Insular Affairs, 92 Cong., 1st Sess. (1971).

51. Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519 (1978).

52. Clean Air Act, Public Law 92-157, 85 Stat. 464 (1971).

53. See, for example, Committee Print, "The Electric Reliability Council of Texas Intertie Situation," Subcommittee on Minerals, Materials and Fuels of the Senate Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

54. Otter Tail Power Co. v. United States, 410 U.S. 366 (1973). See also, _____, Public Utility Regulation: Wheeling and the Sherman Act, 1972 Law and Social Order 507; _____, Antitrust Law--Public Utilities--Power Company's "Refusal to Deal" with Former Municipal Customers Found to Violate Sherman Act, 5 Seton Hall Law Review 92 (1973); _____, Antitrust--Regulation by the Federal Power Act Does Not Immunize Electric Utility From Sherman Act Sanction Against Refusals to Deal Intended to Create or Maintain a Monopoly, 23 Drake Law Review 182 (1973).

55. See, Legal History of Conservation of Oil and Gas, a symposium published by the Section of Mineral Law of the American Bar Association (1938), at p. 1.

56. Id.

57. See generally, Economic Aspects of Oil Conservation, by Wallace F. Lovejoy and Paul T. Homan (The Johns Hopkins Press, Baltimore) 1967; and Conservation of Oil & Gas--A Legal History, 1948 (Use and Abuse of America's Natural Resources), Edited by Blakely M. Murphy (Arno Press, New York) 1972,

58. Supra, Footnote 20.

59. Public Law 95-2, 91 Stat. 4 (February 2, 1977).

60. Id., Article III.

61. See, for example, 1976 Legal Report of Oil and Gas Conservation Activities, published by the Interstate Oil Compact Commission (Oklahoma City, Oklahoma) 1976.

62. See, Railroad Commission of Texas v. Rowan & Nichols Oil Co., 311 U.S. 570 (1941), and Railroad Commission of Texas v. Humble Oil & Refining Co., 311 U.S. 578 (1941).

63. See generally, State Control of Business Through Certificates of Convenience and Necessity, by Ford P. Hall (Indiana University, Bloomington) 1947.

64. Smyth v. Ames, 169 U.S. 466 (1898); and Bluefield Co., v. Public Service Commission, 262 U.S. 679 (1923).

65. Several cases prior to Federal regulation are instructive. See, San Diego Land Co. v. National City, 174 U.S. 739 (1899); San Diego Land & Trust Co. v. Jasper, 189 U.S. 439 (1903); Wilcox v. Consolidated Gas Co., 212 U.S. 19 (1909); Minnesota Rate Cases, 230 U.S. 352 (1913); Galveston Electric Co. v. Galveston, 258 U.S.388 (1922); Georgia Railway v. Railroad Commission, 262 U.S. 625 (1923); McCardle v. Indianapolis Co., 272 U.S. 400 (1926); and, St. Louis & O'Fallon Railroad Co. v. United States, 279 U.S. 461 (1929).

66. See, An Outline of Electric Utility Regulation by States, (Clark, Dodge & Co., New York) 1965; and, Trends and Topics in Utility Regulation (Public Utilities Reports, Inc., Washington, D.C.) 1969.

67. Federal and State Commission Jurisdiction and Regulation--Electric, Gas and Telephone Utilities, (Federal Power Commission), (1973).

68. See, Committee Pring, "Electric and Gas Utility Rate and Fuel Adjustment Clause Increases, 1975," Subcommittee on Intergovernmental Relations and the Subcommittee on Reports, Accounting, and Management of the Senate Committee on Government Operations, 94th Cong., 2d Sess. (1976).

69. See, Subcommittee Pring, "Electric Utility Automatic Fuel Adjustment Clauses," by the Subcommittee on Oversight and Investigations on the House Commerce Committee, 94th Cong., 1st Sess. (1975).

70. The Utilities Act of 1975, Hearings before the Subcommittee on Intergovernmental Relations and the Subcommittee on Reports, Accounting, and Management of the Senate Government Operations Committee, 94th Cong., 1st Sess. (1975).

71. See, Footnote 3, supra.

72. Public Law 94-163, 94th Cong., 1st Sess. (1975).

73. Id., at Section 361 et seq.

74. Id., at Section 202 et seq.

75. See, Standy Conservation Plan No. 2--Emergency Building Temperature Restrictions, U.S. Department of Energy (1979), established under Section 202 of the Energy Policy and Conservation Act, 42 U.S. Code Section 6262.

76. See, Footnote 3, supra.

77. PURPA, supra, at Section 116.

78. Id., at Sections 113 and 115.

79. Id., at Section 114(g).

80. Id., at Section 121.

81. Id., at Section 122.

82. Id., at Sections 141-143.

83. See, The Wall Street Journal, April 27 1979, at p. 24.

84. See, for example, United States v. Wrightwood Dairy Co., 315 U.S. 110 (1942); Wickard v. Filburn, 317 U.S. 111 (1942); United States v. Gainey, 380 U.S. 63 (1968); and Leary v. United States, 395 U.S. 6 (1969). Compare, National League of Cities v. Usery, 426 U.S. 833 (1976).

85. PURPA, supra, at Sections 202 and 212.

86. PURPA, supra, at Sections 202 and 212.

87. PURPA, supra, at Sections 203 and 212.

88. See, Public Utility Regulatory Policies Act, Senate Conference Report 95-1292, 95th Cong., 2d Sess. (1978), at p. 90.

89. PURPA, supra, at Section 208.

90. PURPA, supra, at Section 209.

91. PURPA, supra, at Section 210.

92. See, Footnote 3, supra.

93. See, Powerplant and Industrial Fuel Use Act, Senate Conference Report 95-988, 95th Cong., 2d Sess. (1978), and Section 102 of the Powerplant and Industrial Fuel Use Act, supra.

94. Powerplant Act, supra, at Title II.

95. See, proposed regulation implementing the Powerplant and Industrial Fuel Use Act, 43 F.R. 53974 (November 17, 1978) and 44 F.R. 5808 (January 29, 1979).

96. See, Footnote 3, supra.

97. Natural Gas Policy Act of 1978, supra, Title I.

98. Id., at Sections 501(c) and 503.

99. Natural Gas Policy Act of 1978: Interim Regulations, 43 F.R. 56448-56636 (December 1, 1978).

100. Id., at 56604.

101. See, for example, United States v. Sharpnack, 355 U.S. 286 (1958); and, see Kauper, Utilization of State Commissioners in the Administration of the Federal Motor Carrier Act, 34 Michigan Law Review 37, 46-49 (1935).

102. See, Footnote 45, supra.

103. Natural Gas Policy Act of 1978, supra, Sections 301-304.

104. Id., at Sections 401-404.

105. See, for example, Sections 105 and 301-304.

106. ___U.S.___, 47 L.W. 4447 (1979). See also, Arizona Public Service Co. v. Snead, ___U.S.___ (No. 77-180, Decided April 18, 1979).

107. See, Footnote 21, supra.

108. Id., at 255.