

ENERGY, WATER AND ENVIRONMENT --  
INSTITUTIONAL AND POLICY ASPECTS

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This paper will present a definition of the scope for institutional and policy analysis. It will then summarize the general institutional problems identified for the energy-environment questions. Some of the details and opportunities of water-related problems in the Northeast will be introduced. Then a rough strategy for how water institutions might respond to the energy opportunity will be sketched. The results should be quite familiar to students of water policy because the elements of the accommodation of legitimate conflicting interests are so similar.

What is the Institutional-Policy Analysis Turf?

Every discipline or problem area has its own point of view and a potential contribution to policy analysis. The organization of information to provide knowledge for decision making must use inputs from different sources if the character of decision-making outputs are to change significantly. Institutional analysis should concern itself with the informal rules and formal regulations, with the incentives and disincentives for alternative behavior, and the organizations available to get specific and unspecific things done. Institutional analysts should also concern themselves with the various active and potential participants in the decision-making process, their resources for participation and the stake they have in participation.

The economic analyst who operates in the tradition of micro and macro economics is oriented toward identifying that decision which those affected would choose if they could choose (given the usual caveats of the winners being able to bribe the losers). But here the objective should be to design the structure for decision making such that those affected by a decision would agree that the balance of interests

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was appropriate. In other words, what set of institutional arrangements would we choose to choose for us if we could choose the choosers?

Such an analysis must have both normative and behavioral components. Some normative rules can be drawn from economic-like reasoning, but most seem to follow from concepts of democratic government, from notions of equity rather than efficiency. Behavioral guidelines follow from the observation of participants and institutions, from some reasoning based upon the social-psychology of the participants and often from deductions based upon an understanding of the technical processes involved.

The following propositions were drawn up in this spirit by a group who examined the institutional problems associated with environmental aspects of the energy crisis at the behest of the Senate Interior Committee.<sup>3/</sup> They should look quite familiar to students of water institutions.

First, the kinds of restraints on energy production and use to deal with environmental effects which will best serve the public interest cannot be scientifically determined.

Second, it is assumed that, in general, a decision by a governmental entity is in accord with the public interest if (a) the views of those affected by the decision have been taken into account in the decision and (b) the views of those affected have been based upon the best available information about the consequences of alternative decisions.

Third, because of the large number of issues with which government is concerned and the many facets of the problems that must be considered, the reflection of public views on the environmental effects of energy production and use cannot be achieved solely through the processes of election of public officials, such as chief executives and legislators; therefore, supplementary processes are required.

Fourth, studies in political science and administrative behaviour clearly demonstrate the tendency of administrative agencies to be strongly influenced by well organized interest groups, both public and private; interests that are not well organized -- even though large -- tend not to have their views reflected in the decisions of administrative agencies.

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3/ Extracted from I. Fox, D. Allee, et. al., "Institutional Arrangements for Dealing With the Environmental Effects of Energy Production and Use." A contribution to the Summary Report of the Cornell Workshop on Energy and the Environment sponsored by the National Science Foundation and the Committee on Interior and Insular Affairs, United States Senate, Committee Print Serial No. 92-23, May 1972, Washington, D. C.

Fifth, studies of individual and organizational behaviour have demonstrated that the alternative policies and programs that an individual or group considers relevant, depend upon the experience and interest of the individual or group; therefore, an administrative agency dominated by individuals trained in a particular profession or influenced primarily by one interest group (such as the petroleum industry) will tend not to view as relevant, alternative programs that would be considered desirable by an agency dominated by another profession or another interest group.

Sixth, in view of the foregoing considerations, it is concluded that the overall public interest will be served best if:

- A. Legislative bodies define as precisely as practicable the policies which administrative agencies are to administer.
- B. Costs or damages to the environment caused by energy production and use are borne by those creating them to the fullest extent practicable.
- C. Each significant set of interests in society is equipped to identify the kinds of policies and programs which will best serve its interests and present these views forcefully to those who make the decisions in behalf of the public.
- D. The institutional structure provides arenas in which the differing interests can bargain about their differing objectives and programs, rather than allowing individual decisions to be made without the trade-offs being considered.

The panel which agreed upon the above propositions then identified the following four limitations of the then existing institutional arrangements in the energy-environment area at the federal level.

1. Inadequate provision is made for developing and providing on a continuous basis a solid foundation of information about energy resources, the production and use of energy and the environmental effects of these activities.
2. There is incontrovertible evidence that because of the imbalance in the influence of various sectors of society over public energy decisions, existing decision making processes do a very unsatisfactory job of reflecting social preferences in this area of public activity.
3. Energy policies and programs and regulatory decisions are made at a number of separate locations in the federal government so that there is little opportunity to balance off the inter-relationships among individual decisions.

4. Regulatory responsibilities are interwoven with program responsibilities leading to a confusion of the responsibilities of regulatory bodies. On the one hand they are expected to be quasi-judicial in nature and weigh competing claims objectively. On the other hand, they are expected to promote particular programs in which some groups have a special interest.

While progress has been made in almost every one of the above limitations at the federal level, the remainder of this paper will seek to explore the possible adjustments that might be made with special attention to inter-relations with water institutions and the regional level -- particularly the multi-state river basin as a management region. However, this examination will have more significance if it is first placed in the context of an analysis of the overall problem. This is essentially an institutional analyst's version of the other three topics designated for this panel.

#### Technical Flexibility is Substantial<sup>4/</sup>

The Energy Policy Project of the Ford Foundation has tentatively concluded that within the range of possible institution changes there is substantial flexibility to achieve energy needs. Expanded consumption at our long run historic rate (3.4 percent per year) can continue to 2000 with at least three significantly different mixes between imports, domestic fossil fuels and nuclear development. A growth rate of half that level is seen as possible through applications of known conservation technology. Perhaps optimistically, behavior that would lead to such a reduction in expansion is seen as nearly within the range of incentives that resulted from shifting full costs of energy use and production to the market place.

The greatest savings in this lower level of energy use are seen as coming from a relatively small number of the present uses of energy. Space heating and cooling through greater use of heat pumps, insulation and solar energy are seen as needing only small shifts in relative prices to be practical generally to the user. Industrial heat production accounts for over a quarter of energy use and can be made more efficient through heat recovery, combining steam production with electricity production, use of heat pumps, etc. Smaller cars, radial tires, streamlining, power train redesign, diesel engines, expanded mass transit use, and the like are the key to conservation in this large energy category. The result of such changes is the ability to make much wider choices in near-term supply development. Only one of the major energy sources -- oil imports, domestic fossil fuel or nuclear power -- need be developed

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<sup>4/</sup> This section draws heavily from Freeman, S. David, et. al., Exploring Energy Choices -- A Preliminary Report; Energy Policy Project of the Ford Foundation, 1776 Massachusetts Ave., N.W., Washington, D. C., 20036; 1974.

significantly. Alternatively, the environmentally least disruptive mix of the three could be chosen -- if we have the institutional capability to make a considered choice. The breathing space in supply development could be put to more care and study of our long run options.

If all existing subsidies to energy production and use were removed, to the extent possible, would the resulting prices be enough to achieve growth in demand of half the historic rate? Probably not. Other changes seen as necessary include better information to the consumer on what energy use (and operating cost) is associated with the various appliance and housing options presented. Financing, organizational arrangements and other institutional changes to make low energy options for transportation, space heating and cooling, etc., really competitive options, would be called for. Depletion allowances and favorable freight rates for raw materials as opposed to recycled materials, differences in transportation subsidies, research and development expenditures on energy consumption efficiencies at least equal to those on production improvements are all areas of potential policy change. The energy problem to the year 2000 does not appear to be so much technical in nature as it does institutional.

#### Special Problems in the Northeast

The Northeast enjoys some of the largest areas of high density population in the nation. Environmentally, it probably contains the people and their activities about as effectively as any part of the nation, thanks to its higher rainfall per acre. The scars heal more quickly. But the "Faustian Bargain" of nuclear power presents a special dilemma in this situation. The perceived risk of nuclear accident -- of designing, building, operating and disposal of waste without flows -- seems greater where there are so many to be affected. Yet imported oil is not risk-free and coal development will only partly export the environmental problems of supply development. All three modes use water to transmit their environmental consequences. Nuclear development seems to call for institutional capacity the like of which man has not achieved before and it is not at all clear that he has achieved it yet.

Coastal zone management -- with power plant siting, oil spills, and low energy use navigation -- is giving us a chance to develop and test new arrangements to manage natural resource use. The problems are quite similar to those faced by the river basin as a unit of management. Coastal zone management is providing a focal point for a different set of relationships between levels and agencies of government, however. The basin agencies -- and whatever other regional management concept becomes fashionable next -- may have much to learn from this developing experience. Perhaps it will be a return to the metropolitan region with energy conservation as the organizing concept.

Acid mine drainage is a most frustrating problem and has been with us in the Northeast for many years. It is not easy for the operating mine to prevent the leaching, aeration and other processes that lead to the acidification of such huge amounts of water. But when the mine is abandoned and was worked with no thought to the problem correction becomes

complicated indeed. Various methods of sealing and treating have their proponents and detractors. Those that represent high one-time investments with limited year-to-year management offer the potential of appealing to the political processes of water projects. Action programs by the Corps of Engineers and Soil Conservation Service suggest themselves. Alternatively, treatment approaches requiring continuing expenditures may better lend themselves to state and regional initiatives, with some federal inducements. The trick will be to insure that the appropriate burden of cost is placed on the active mine operation (which will only in part be passed on to the fuel consumers). The abandoned sources of acid will have to be a public burden and probably only funded partly, if at all, by the direct beneficiaries. Our history of dealing with pollution from marginal, obsolete industrial plants in areas of limited alternative employment suggests that new regional approaches are called for. Perhaps the Appalachia model will apply.

Cooling water should provide a more immediate test for our slowly developing basin management arrangements to meet an energy related environmental test. Both the Delaware and the Susquehanna compact commissions have the opportunity to deal with power plant siting. The Delaware has considered development of generating capacity less than projected in basin demand growth; the Susquehanna has had a proposal of more generating capacity than growth of projected demand in the basin. The Delaware could then be said to be importing electric power and exporting environmental impacts. The cooling towers of the next power plant that goes on line along the Susquehanna may put the assured low flow below that which has been agreed as the minimum to be discharged to Chesapeake Bay. Varying temperature standards to reduce evaporation isn't likely to be an acceptable solution. It will be interesting to see how the flow regulation required will come about. Good dam sites are scarce; and ones without controversy may not exist at all.

If the state-oriented basin commissions can't deal with these conflicts, will the traditional federal agencies fare any better? It seems clear that the Congress would welcome a lower level of conflict in water development. And in the East as in the West, energy related opportunities may give our water institutions a new chance to find ways to deliver the bacon without burnt Congressional fingers. What will it take? It is doubtful that controversy can be avoided. The issue is "where can it be best resolved?"

#### Requirements for Successful Response to the Energy Crisis by Water Institutions

If the water institutions fail to resolve the pending conflicts they will be managed in other arenas to the detriment of the scope and influence of the water institutions. This does not mean that all participants in the decision-making process must feel and sound satisfied. That just doesn't happen very often in the accommodation of legitimate conflicting interests. What can and must happen is that a working majority of the other participants feel that any one other participant was reasonably and fairly dealt with. Unilateral accommodation rather than bilateral accommodation is much more to the point. Thus the trick becomes

searching out those accommodations that will be generally recognized as fair and reasonable. The above elements can be drawn upon to provide the outlines of one or more strategies for finding such accommodations.

First, the water agencies could turn their very considerable planning capacity toward correcting the inadequate information about energy, particularly as it relates to water as a transmitter of environmental effects. Everything is linked to everything else but sometimes the effects are far less than as imagined. Water is often the medium that has to be understood to verify impacts.

Second, the water agencies could and should develop access to the decision-making process for interests that will lead to a more balanced reflection of social preferences in the overall energy decisions. For example, the moderate environmentalist might see the water agencies' participation as leading to more environmental responsiveness than if the energy decision system went its usual way.

Third, the water agencies, as an elaboration of the first point, could use their familiarity with the total physical water system and the related ecosystems to provide more informed coordination between energy modes and otherwise unrelated energy decisions. For example, hydro-electric facility permits, among others, come up for periodic review. The environmental consequences of substitute forms of power should be set against the environmental consequences of alternative future operating rules and the like.

Fourth, the promotional and developmental functions and the regulatory functions of water agencies should be kept as distinct as possible rather than compounding the already difficult problem in the energy agencies.

Finally, the water agencies have opportunities and a stake in demand management. Energy conservation and the resulting breathing space for supply development may allow them to play a more positive role in the long run solutions to the energy problem. But also greater creditability and opportunities for environmental accommodation may be found in energy conservation promoted in water-related decisions.

The general problem in dealing with the energy-water-environment questions is the same as that we have faced in the water-environment questions that have occupied our attention longer. How do we achieve the institutional flexibility to make the best use of our considerable potential technological flexibility.



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