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**Behavioral Approaches to Energy Conservation in Organizations:  
A Selected Review of the Literature**

RON WIDMAN, DEBORAH SIMMONS  
RACHEL KAPLAN, and RAYMOND DE YOUNG

School of Natural Resources,  
The University of Michigan

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Behavioral Approaches to Energy Conservation  
In Organizations // A Selected Review of the  
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by

Ron Widman, Deborah Simmons, Rachel Kaplan, and Raymond De Young

School of Natural Resources  
The University of Michigan  
Ann Arbor, Michigan

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## INTRODUCTION

Despite the widely acknowledged importance of energy conservation and the steadily growing volume of research in this area, energy conservation in the institutional context has received little attention. No doubt many strategies and approaches have been applied in a variety of institutions (e.g., American Council on Education, 1980), but these have generally not been based on any systematic research. The purpose of this paper is to provide an overview of the behavioral approaches that have been used and to extend this material to the context of energy conservation in organizational settings, and in particular to higher education.

Our discussion of behaviorally-based conservation strategies will focus on the role of two main factors: motivation and information. Both factors have been investigated by the behavioral sciences because of their hypothesized effect on human behavior (see Geller, Winett, and Everett, 1982). While these can be labeled readily, they are, in fact, often not clearly distinguishable from each other. Information can in itself provide some motivation and incentives can in themselves have informational properties. Nonetheless, we find it is useful to distinguish these two factors and will examine research findings which speak to their effectiveness in different situations.

The literature on motivation in the context of energy conservation draws almost exclusively on incentives -- on ways to entice people to change their behavior because of a perceived or promised gain (often of a monetary sort). However, while there is little recognition of it in the energy conservation literature, not all motivation is extrinsic. People also do things for intrinsic reasons, for the sake of the activities themselves. In fact, sometimes the promise of a tangible reward makes an otherwise acceptable activity become less desirable!

The discussion of informational approaches includes a variety of prompts or relatively brief messages intended to encourage conservation. In addition, it is useful to examine other sources of information that are present in the setting itself.

Finally, while motivation and informational factors are useful to examine separately, it is particularly useful to consider their joint effect. The use of feedback, discussed in the "Integrative Approach" section, is a powerful device that combines these factors.

The translation of the behavioral literature on motivation, information, and feedback to the organizational or institutional context is not straightforward. It is difficult to determine whether studies that are based on individual behavior, often in the residential context, are applicable in an organization. An important step, we feel, in making such studies more likely to be useful in this setting, is putting a participatory approach to conservation efforts into effect. By having members of an organization share early in the effort, the likelihood of a successful outcome may be enhanced. This enhancement may be explained by examin-

ing the motivational and informational aspects of participation. The final section of this review thus examines some facets of the participation literature in terms of its usefulness in enhancing energy conservation in the organizational setting.

### Ways to Motivate Behavior

It is generally assumed that changing people's behavior requires some inducement or incentive. Geller, Winett, and Everett (1982) and Cone and Hayes (1980) have documented numerous studies which used incentive-based behavioral strategies to encourage individuals to conserve energy. It is important to recognize, however, that extrinsic rewards are not the only source of motivation. People are also motivated by a variety of activities that are in themselves sources of satisfaction. This class of motivation has been called "intrinsic." To date, the vast majority of research related to energy conservation has emphasized extrinsic motivations with financial incentives the most common form of reward. In fact, it has been pointed out that just about all resource conservation policy has addressed only economic factors which can serve as powerful sources of motivation (see Geller, Winett, and Everett, 1982).

#### Extrinsic Incentives

An activity is extrinsically motivated if it is done "in order to" get some reward. Examples of monetary incentives used to encourage energy conservation include rebates of savings resulting from reduction in energy consumption or off-peak usage, prizes in conservation "contests," low interest loans for the purchase of energy-efficient houses, and tax credits for installation of energy conservation hardware. While fiscal incentives are used most extensively, extrinsic rewards are not limited to this source. Cook and Berrenberg (1981) report on a variety of other types of extrinsic incentives such as comfort, convenience, and social approval. The trade between time and money is strong in our culture.

In developing an energy conservation program using extrinsic incentives (particularly monetary incentives), it is important to consider the following:

extrinsic incentives can be successful in encouraging people to perform the desired behavior.

In a discussion of the psychological aspects of energy conservation, Stern and Gardner (1981) suggest that large monetary incentives can induce people to save significant amounts of energy. Similar findings have been reported in a related conservation domain, that of recycling and reuse of household solid wastes (see Jacobs and Bailey, 1982-1983).

the effects of reward-based conservation programs may not endure for a long time after the end of the program.

In summarizing the available experimental research on the effect of extrinsic rewards on conservation, McClelland and Canter (1981) reported that although financial incentives encouraged conservation behavior, the effects were typically limited to only three to ten weeks. This suggests a transient or novel characteristic exists with respect to extrinsic incentives.

economic inducements may not be cost-effective.

Incentive programs may not be cost-effective if the price of the energy being saved is relatively low in comparison to the incentives offered. While some programs have been financially successful, in other cases, the cost of sustaining an incentive program has exceeded the monetary value of the energy saved (McClelland and Canter, 1981). This finding was also noted in the Jacobs and Bailey (1982-1983) study on recycling. The cost-effectiveness of using economic inducements is affected by both the direct cost of the incentive and the less visible administrative costs.

#### Intrinsic Motivations

A good deal of human behavior cannot be explained on the basis of extrinsic rewards. People do many things which "feel good" even without the promise of tangible returns (Csikszentmihalyi, 1978; Deci, 1975; Eckblad, 1981; Lepper and Greene, 1978). An activity is considered intrinsically motivated when it is viewed as worthwhile in its own right and not simply as useful "in order to" achieve some goal. Thus, a frugal life-style, a sense that one's actions matter, a feeling of coherence between one's own efforts and the larger world, and an overall sense of well-being are all important human concerns that guide behavior. In fact, Deci and Porac (1978:153) believe that "there is a high degree of correspondence between one's psychological health or well-being and one's being active in the sense of being intrinsically motivated."

Although intrinsic motivation traditionally has been underutilized in conservation programs, there is increasing evidence of its applicability. A relationship between intrinsic motivation and conservation behavior was found in one recent study (De Young, 1984). Reichel and Geller (1981:88) suggest that conservation should be expected, valued, and rewarded; "such norms may even be internalized by individuals so that conserving behaviors become intrinsically reinforced." Certainly changing societal conditions are helping to increase the desirability of frugal and conserving lifestyles (Graef, Gianinno, and Csikszentmihalyi, 1981) and the growing appeal of the emerging "conservers society" (Hardin, 1979) will prove to be more effective than economic factors in promoting the adoption of energy conservation strategies.

In designing a program that incorporates intrinsic motives for energy conservation, a number of factors should be taken into consideration:

energy conserving activities which are intrinsically motivated are "self-satisfying."

Seligman, Becker, and Darley (1981:111) have pointed out that as individuals became involved in energy conservation activities "they (became) interested in and challenged by the task of lowering their energy consumption, and felt satisfaction not previously present when they did so."

intrinsic motivations may prove to be more enduring than extrinsic (especially monetary) incentives.

In an investigation of recycling, Pardini and Katzev (1983-1984: 251) speculated about why their use of a moderate, rather than strong form of external inducement (their treatments included getting people to make a verbal or written commitment to recycle) was able to maintain behavior when "virtually all attempts to sustain recycling behavior under incentive-based programs have traditionally been characterized by an abrupt cessation of recycling once the external incentive is withdrawn." They suggest (1984:253) that the participants in their study, by virtue of their commitment to carry out the behavior (at least for a while), may have been led to "find their own reasons for recycling, to begin to even like doing so, and, as a result, to continue to perform these behaviors on their own."

strategies based on intrinsic motivations may prove to be more cost-effective than those based solely on monetary rewards.

As was mentioned previously, the cost of running a financially based incentive program may exceed the actual savings. In any case, if an effective program to support intrinsic incentives can be developed, it may be less expensive to operate over the long term. Additionally, McClelland and Canter (1981) note that some people are not interested in financial incentives. Presumably, then, intrinsic approaches may be more effective at involving these individuals in a conservation program.

### Providing Information

Information serves to remind people of when to do things, lets them know what things should be done, and gives them imagery on the impact of new and ongoing conservation activities. Information can support existing conserving behaviors, provide ideas for new ways of doing things, and help to establish new, more conserving behavioral norms.

The use of information in encouraging energy conservation may involve prompts<sup>1</sup> (short messages) aimed at inducing certain actions, particular

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<sup>1</sup>Energy information may involve either short messages, "prompts," or longer, more involved packages of information such as booklets or training sessions. While many of the principles that are important in the design of prompts carry over to the design of longer informational pieces, they each have their own unique characteristics. Prompts are good as reminders of what to do when, whereas more complete information about how energy systems work, or the variety of ways in which energy savings can be achieved, requires a much more involving educational approach.

bits of information, such as posters or bulletin boards, or may be more generally conveyed by the condition of the environment (lights left on, etc.) and the observed actions of other people. In reviewing the use of information in energy conservation, prompts will be discussed first, followed by the role of the environment in providing cues regarding appropriate behaviors.

### Prompts

Ideally, prompts should educate people as to what to do in certain situations and remind them to do such things at appropriate times. Prompts vary in form from stickers on light switches reminding people to turn off lights to more generalized poster campaigns. In this discussion, prompts are being used to describe information that is delivered to people before or at the moment that action is required (e.g., to turn off the lights when leaving a room). Information that is provided as a consequence of an action (feedback) is discussed in the section below on developing an integrated approach.

In reviewing a large number of research studies that examined the role of information presented before an activity, Ester and Winett (1981-1982) found that prompts were more effective if they:

- . gave specific information with regard to the requested behavior

Specific information which targets a particular action at a particular time (e.g., Please turn the light off when leaving the room.) was more effective than generalized information such as (e.g., Please help conserve energy.)

- . were considered important by the target audience

Prompts can make the importance of the action explicit (e.g., Turning out unused lights saves departmental funds.) or they can serve as a reminder when a high level of interest has already been created by other means (rewards, goal setting, general concern or basic desires of people to conserve).

Kahneman and Tversky (1979) note that people are more sensitive to incurring a loss than they are about enjoying a gain. Yates and Aronson (1983) suggest that therefore "loss" avoidance should be emphasized over the possibility of "gain" when linking results to energy conservation efforts.

- . were given frequently or presented in different ways

More frequent information is needed in situations where there is low commitment or where the required action is inconvenient. There also must be a consideration of the nature of the task; information

should be available at the point of decision about an energy-conserving action. However, the frequency and style (intrusiveness) of prompts can be overdone (Aronson and O'Leary, 1982-83). Some judicious balancing of the frequency and style of prompts needs to be done.

- . were located near the place where the activity would take place

Prompts are often designed to support a very specific behavior, so having the reminder near the point of action allows an easy connection between the prompt and the action. For example, prompts concerning things to do when leaving a room could be placed near the door (See Zolik, et al, 1982-83).

- . were attention-getting

As one would expect, messages which people find interesting are more effective than ones which are not interesting. In comparing the Canadian and United States governments' ad campaigns on energy conservation, Stern and Aronson (1984) surmised that vivid pictorial and graphic illustrations, along with appeals to motives on a variety of levels (nationalistic, financial, individual, political, etc.) were more likely to increase the effectiveness of the communication.

Yates and Aronson (1983) note the particular value of vivid and concrete examples such as using a source of smoke (e.g., commercially available "smoke stick") to make air leaks visible as being more effective than simply telling people how much heat is lost through gaps in windows and doors. Similarly, referring to the saving successes of other local people (e.g., neighbors) is useful. The utility of vivid examples is consistent with evidence that most people have problems with integrating large amounts of quantitative information that may relate to making a particular decision (Kempston, Gladhart, and Keefe, 1982; Yates, 1982) and will rely too heavily on personal accounts of others they know, or other concrete examples of failure or success.

Prompts which are interesting to people are effective. However, prompts that overdo it by being too large or forceful can be annoying to people. (See Luyben, 1980; Aronson and O'Leary, 1982). Reich and Robertson (1979) report that forceful or threatening prompts such as "Don't you dare litter" are quite ineffective.

- . ask for behavior which is considered convenient by the target audience.

While there is an obvious benefit to encouraging behaviors that are easy for people, asking for less convenient behaviors may be necessary at times. The issue of which behaviors are too costly in terms of time, effort, comfort, etc., will vary with individuals.



However, in general, compliance with such requests will be improved if prompts are linked to a reward or penalty associated with the adoption of inconvenient behaviors (Geller, Winett, and Everett, 1982).

### The Environment As Information

Prompts are generally thought of as being stated. The condition of the environment itself, however, can act in a similar manner as a cue to appropriate behaviors (Stern and Aronson, 1984; Ester and Winett, 1981-82). The state of the place we are in helps to define the norm of behaviors in that place; if the lights are always found to be out in unoccupied classrooms, then, hopefully others will accept that as normal behavior.

Other people are also a part of the environment, and, as such, can play a role in spreading information and defining norms. Yates and Aronson (1983) note the powerful influence of person-to-person diffusion of ideas which is likely to be more heavily weighted by people than by "media-based" information. People who watched videotapes of "models" enacting ways of adapting to cooler residential temperatures during the heating season were found to have used substantially less energy (Winett, et al, 1982; also Bandura, 1977).

Finally, Aronson and O'Leary (1982) report that the use of confederates as behavior models was more effective in encouraging conserving behavior than were prompts when used alone. Consequently, the potential value of "early conservers" as role models should not be underrated.

### Developing An Integrated Approach

Recent investigations have clearly demonstrated that conservation activities, as most human behavior, can be influenced in many ways. Conservation strategies will be more successful if they address several concerns that people have (such as social and environmental responsibilities, the enjoyment of doing things and tinkering, interacting with other people, and fiscal concerns [Simmons, Talbot, and Kaplan, 1984-85]). No matter which concerns are considered, however, conservation strategies must address both informational and motivational aspects (Fisher, Bell, and Baum, 1984). People need to understand what it is they should do, how best they can go about doing it, the impact that will result from carrying out the behavior, as well as have an interest in performing the needed activities. In other words, neither information nor motivation (intrinsic or extrinsic) works as well separately as they do jointly. Although prompts provide information about what to do and how it should be done, they do not provide the motivation to act. Likewise, motivation may be secured through incentives, but the information necessary to act may be missing.

Information and motivation can be linked, however, within one strategy. In fact, feedback has been found to have the advantage of providing both information and motivation (Oskamp, 1983; Ellis and Gaskell, 1978; Seligman,

Becker, and Darley, 1981; Stern and Aronson, 1984). Feedback involves the use of information to tell people about the direct effects of their actions. A meter that indicates how much energy is being used by a particular appliance is one example. In essence, it makes the pattern of energy use more visible. Such information acts to both reinforce conserving behaviors and to discourage energy-consumptive actions (Fisher, Bell, and Baum, 1984).

Interestingly, research supports the notion that feedback may be a more suitable strategy than the use of information or motivation alone. Feedback was found to be one of the most effective strategies examined by Geller, Winnett, and Everett (1982), while information alone has been found to be mostly ineffective (Cone and Hayes, 1980). Furthermore, monetary incentives, which are purely motivational in nature, are often found to be ineffective when used alone. But when coupled with feedback, which supplies the information component, monetary incentives have been found to be quite effective (Winnett and Neale, 1979).

The way in which feedback is presented to people, however, is of critical importance in its effectiveness. In designing a program that incorporates feedback in encouraging energy conservation, the following findings should be taken into account:

- . feedback should be credible, with changes in behavior being visible through changes in the feedback (Stern and Aronson, 1984).

For example, the influence of the recent weather patterns must be taken into consideration when evaluating heating fuel use. In addition, the use of units or information that are not understood may contribute to that information being discredited (Winnett and Neale, 1979). Likewise, Stern and Aronson (1984) note the need to use "familiar and intuitively meaningful concepts" in the presentation of feedback information. If the units are not simple and readily understandable, then it is likely that they will not be used.

- . feedback should be salient. A meaningful link between the "action" and the energy "savings" should be made.

The role of feedback is to give visibility to the use of energy that would otherwise be difficult to realize. If one is concentrating on the energy use of a particular element of the energy system (e.g., vent hoods or steam heat), it is important to give feedback which gives information directly about those elements. The individual energy consumer should be able to tell what effect his/her actions will have on energy use. Having feedback follow immediately after some action helps make the connection between energy use and the activity. Feedback has been found to be particularly effective when energy use is on peoples' minds, such as during especially cold weather (Cone and Hayes, 1980).

- . feedback should focus on outcomes specific to one individual, rather than aggregating the savings information across a larger group (Winett, et al, 1979).

However, the combination of both types of feedback can be quite effective. Of course, if one is trying to reduce energy use in general by focusing on a broad group of energy saving elements (strategies) or among a group of people, then aggregation is less of a problem.

- . particular attention should be paid to the frequency of the feedback.

The effectiveness of feedback has been found to increase with the frequency of the feedback (Seligman and Darley, 1977). However, Stern and Aronson (1984) note that highly frequent feedback may be important only for people with relatively little commitment or when the savings action is relatively inconvenient (see Seligman, Becker, and Darley, 1981).

While feedback programs can be effective, one needs to be concerned with both the durability of the effect and the cost-effectiveness of the feedback program. Conservation efforts developed through feedback programs have been found to be retained for as long as about 12 weeks (Winett, et al, 1981) to several months (See Oskamp, 1983; Pallak, Cook, and Sullivan, 1980). One might speculate that the durability of feedback rests on the nature of the motivation to conserve. Where strong motivations exist, feedback can be used as a tool to raise people's awareness of the use of energy associated with various activities. However, people with less motivation to save, who are responding to the incentives or disincentives associated with feedback, may be less likely to continue with the conserving behavior for a long period of time if it has not become habit.

It should perhaps be noted that information and intrinsic motivation are also readily combinable. In fact, it is possible that feedback that is linked to things one is naturally curious about would be particularly effective. We are not aware of research in energy conservation that has examined this question.

Feedback, by definition, is given during or after conservation activities are performed. Additionally, strategies incorporating both information and motivation that precede the action can be developed. Although Ester and Winett (1981-82) point out that most antecedent strategies have fared poorly in evaluations of their effectiveness, they argue that these strategies hold promise if properly formulated.

## The Institutional Context

The applicability of the behavioral approaches in an organizational setting is far from straightforward. While extrinsic motivation has been shown to be effective in some energy conservation programs, it is often difficult to use such a procedure in the organizational context. Katz and Kahn (1978) have discussed the use of external and internal motives within the organizational environment. They indicate that, in general, the use of extrinsic rewards within an organizational system does not stimulate more than minimally acceptable performance and involvement. They also report that such rewards tend to be ineffective in encouraging innovative behavior. Furthermore, the incentives to individuals would often be too small to be motivating, while incentives to the group as a whole may be difficult to distribute. Katz and Kahn (1978) also suggest that intrinsic motivation, while the most effective of motive patterns, is the most difficult to evoke within the confines of conventional organizational structure. Similarly, even feedback may not be easily applicable in the institutional context where it is difficult to connect the feedback directly to the conserving (or nonconserving) behavior of individuals or groups of individuals.

It is, thus, not surprising that approaches to energy conservation in the organizational framework often follow a distinctly different path. By resorting to physical solutions, which can be implemented without involving the building's users, it would appear that one can circumvent many problems. After all, if members of the organization have no way to change their thermostat setting, for example, one can be sure that energy can be conserved. Such top-down, technological solutions may be tempting, but they have serious drawbacks. One of the more serious of these comes about from the employees' sense of being neither consulted nor needed. Without having been part of the planning and implementation process, employees may feel no compulsion to cooperate in the implementation of the top-down strategy. They may become apathetic about organizational conservation or opt to engage their problem-solving skills in unanticipated and perhaps undesirable ways. Thus the savings achieved by lowering the thermostat settings may be counteracted by a proliferation of small electric heaters that employees bring from home.

Often what may seem to be an efficient organizational response to the challenge of lowering energy consumption may look quite different at the level of the employee. Top-down approaches can have the effect of alienating the employee. Presenting a fully developed conservation plan and soliciting the employees' cooperation can hardly be considered a form of participation. Unless employees are part of the organizational conservation effort, they may view the conservation plan as just another unwelcomed imposition, and, furthermore, an imposition that requires sacrifices of personal comfort and convenience. Furthermore, top-down conservation interventions risk not fully understanding the energy demand/conservation challenge because the experiences and knowledge of first-line employees are not obtained, understood, or used. These individuals are often quite knowledgeable about the local organizational environment and can possess valuable experience, insight, and expertise.

In other domains within the organizational context, the notion of permitting members of the organization to share in the planning, implementation, and evaluation process has become far more prevalent (see Mohrman, 1983). Workers have been provided opportunities to participate in establishing organizational policies and practices, safety and quality control standards, and workplace activities, to name a few. In the educational context, participation in decision-making has been common with respect to a broad range of issues. Approaches to energy conservation, however, generally have not been included within such a participatory framework (Crowfoot and Lesnick, 1984). A notable exception is the work by Kornbluh, Crowfoot, and Cohen-Rosenthal (1984), which specifically examined worker participation in energy conservation and found that such procedures can, in fact, affect conservation.

The growing literature on participation seems directly applicable to this aspect of organizational functioning. The purpose of this section is not to provide an extensive review of this area, but rather to suggest some ways that participatory approaches, in combination with the behavioral strategies discussed earlier, can be helpful in encouraging energy conservation in educational institutions.

#### Some Key Concepts in Participation

There are many ways to achieve participation in organizations. Crowfoot and Lesnick (1984) provide a good theoretical and conceptual overview of the major schools of thought on employee participation and their approaches to energy conservation in organizations. We want to focus on four key issues that must be addressed whatever the particular strategies that are used.

##### Comprehension

People often fail to recognize the relationship between a given activity and its energy implications (Cook and Berrenberg, 1981). It is typical for organizational conservation efforts to prompt employees in an effort to link activities in the workplace with energy conservation goals. While most conservation programs take for granted that providing information about ways to conserve will necessarily result in reduced energy use, the literature on the subject is not that hopeful. Research on the effectiveness of information strategies has had mixed outcomes. A key issue here is the sharing of information, a necessary and crucial aspect of a successful participation process. An aspect of information exchange which is easily overlooked in participation programs is that the provision of information is not equivalent to its comprehension. While the issue of what information is to be made available is important, equally important is the matter of how it is provided. In addition, the various units and levels within an organization may require different types of information to enhance their conservation efforts.

The first vital aspect of information sharing involves attending to the capacity limitation of humans. In general, there is agreement that humans can efficiently process only a limited amount of information at one time.

(Kaplan and Kaplan, 1982). Recognizing this limit means being careful not to overwhelm employees with prompts or feedback. The desire to avoid mental overload may explain why energy management plans are read so rarely by the very employees for whom they were written (see Horowitz, 1982). One must be careful not to assume capacity limitations are a characteristic of subordinate employees only. How one goes about sharing information can reflect whether employees are regarded as intelligent, creative individuals or as undereducated and slow subordinates who must be instructed in every next step.

Another issue involves understanding the prior experiences of the audience. Employees are likely to have had exposure to energy conservation ideas and concepts from their experiences outside of their organizational roles (Crowfoot and Lesnick, 1984). To enhance information exchange, a participation program should structure the information so as to tie into the employees' prior knowledge and experiences. Both talking over the heads of the intended audience and restating the obvious can seriously diminish people's motivation to understand. By presenting new material in a way that is meaningfully related to the individual's prior knowledge structure, one can promote comprehension. This issue assumes, of course, that an effort is made to determine the extent of the individual's prior knowledge structure.

#### Scale

The problems of conserving energy in an institutional setting are often perceived as being of great size and intricacy. This often leads to the development of comprehensive, organization-wide conservation plans. An effective strategy for avoiding the persisting tendency to employ centralized and comprehensive responses to the challenge of organizational conservation is based on a fresh look at the issue of scale. Two aspects of scale, organizational scale and problem scale, are appropriate here.

**Organizational Scale:** It is important to determine where in the institutional structure the participatory effort is most effective. It turns out that reducing the scale or size of the participatory units helps make the decision-making process more manageable. Having numerous opportunities for participation allows the total number of employees involved in the conservation effort to be greatly increased and helps provide each employee with a sense of truly being needed (see Wicker, 1979).

Another benefit of scale reduction comes from involving people who are familiar with local conditions in the conservation effort. A major benefit comes from utilizing employees' prior knowledge. Crowfoot and Lesnick (1984:58), in a discussion of the human growth and development school of thought on participation, have noted that

employees have information and ideas about energy and natural resource use in organizations. They experience and observe day-to-day practices and often know where there are energy and natural resource conservation problems. Many of these same employees have experience with and knowledge of conservation based on their experiences outside of their roles as employees.

By encouraging "lower level" decision-making, one must accept a certain duplication of effort, some internal competition, different problem-solving styles, and perhaps some overlapping solutions. Yet, these seemingly "sub-optimal" facets of decision-making and planning have been identified with successful organizations (Peters and Waterman, 1982). Having some voice in the changes that are made in their organizational environment increases employees' understanding of that environment as well as their sense of belonging and feelings of personal commitment. Having employees who personally identify with a conservation plan can greatly aid its implementation. At work here may be the powerful influence of the person-to-person diffusion of ideas (Yates and Aronson, 1983) and the value of early adopters as behavior models (Aronson and O'Leary, 1982) mentioned previously.

**Problem Scale:** Most Organizational conservation programs are inclined to tackle the full range of conservation opportunities at once. The approach taken is to address all aspects of energy use in one comprehensive energy plan. A more modest approach may have certain advantages over these comprehensive attempts at energy conservation. The conservation process may become more manageable by dealing with each part of the energy and material consumption system as though it were independent of the remainder of the system. Problem scale can be structured in a number of ways, for example, by energy type (i.e., electricity, natural gas, oil, coal), or by end-use (i.e., heating, cooling, lighting, mechanical effort). As with organizational scale, the potential exists for this strategy to result in overlapping solutions. But the duplications of effort may be more than offset by the increased employee commitment to the resulting conservation program.

Another aspect of the problem scale is temporal in nature. Not all opportunities need to be addressed at once and not all solutions are correct for all time. Given time, employees might work on a range of smaller problems. There can be great motivational benefit derived from focusing on a small part of the conservation challenge. Having some successful solutions in place early can provide concrete imagery of what the participatory process is capable of accomplishing. Organizational change efforts might be enhanced by starting with small experimental or demonstration sites within the institutional environment.

### **Level of Involvement**

A successful participation program must deal with the paradox of people wanting to participate but being compelled to avoid the painful experience of overload. There are many opportunities for involvement within an organizational environment, but rarely is there surplus time, effort, or attention to address these opportunities. Employees may resist even well-intended attempts to involve them in conservation programs. This avoidance might be due as much to overload as to a lack of comprehension or scale.

Often the ways of involving employees in organizational conservation efforts do not help in the management of commitment. Too often the participation techniques provide for a high level of involvement or no involvement at all. There is a basis in research findings for trying to get the highest level of commitment possible. The greater the commitment in effort,

cost, or irrevocability, the stronger and more durable the behavior effect (Arbuthnot, et al., 1976-77; Aronson and Mills, 1959; Knox and Inkster, 1968). However, as Simon (1978) has indicated, individuals usually have far more opportunities for involvement than they have attention to deal with them.

A way of resolving this issue of limited attention is to recognize that participatory efforts can function at many levels and need not require the commitment of large amounts of time or effort. There are several modes of participation which aid in the management of involvement. The standard survey instrument can be designed so as to allow employees access to the organizational conservation effort without massive effort. Another mode involves recognizing that many small behavior changes on the part of the individual can play a role in conserving energy. Examples can be provided of small behavior changes which, while seemingly insignificant in themselves, can contribute to significant savings when summed over an entire organization. These examples provide employees with a way of participating in an organization's conservation effort without a major commitment of time. And finally, one can think of feedback strategies as a form of participation. This conservation strategy has the effect of focusing attention on a particular element within the organizational environment and suggests the action or actions most appropriate as a next step. Kornbluh, Crowfoot, and Cohen-Rosenthal (1984) have reported that monitoring, evaluation, and feedback are important and effective components of organizational energy conservation efforts that include employee participation. Some of the reasons this strategy has been successful might be due to its encouragement of involvement.

#### Real Influence

For the process of participation to have its desired effects, people need to know that their input matters. The participants must be given the possibility of genuine impact on the organizational conservation effort. Clearly, it is crucial to involve them early enough in the process so that their input can be included readily in the final decision.

Often economic or political realities limit the influence participants can have. Since there will usually be such uncertainties, an honest discussion of the degree of possible influence is warranted. People are willing to take risks, venturing their time and effort; they can, however, become hostile and uncooperative when what seemed like a promise of impact turns into only a possibility.

Opening up the management process to allow for employee involvement need not be viewed by management as a relinquishing of all leadership. Many people imagine that the concepts of influence and control are necessarily related to each other. The desire of employees to participate, to have an influence, must be distinguished from a desire to assume control of the organization. Underlying the distinction between control and participation is a basic and critical difference: control is defined in terms of outcome, but participation is defined in terms of process (Kaplan and Kaplan, 1982). Participation cannot guarantee any particular outcome, although it is valued nonetheless.



## Conclusion

There is a close tie between participation on the one hand and energy conservation on the other. Many people have demonstrated a sincere dislike for waste and appreciate efforts to reduce it. Many people, in fact, are intrinsically motivated to conserve (De Young, 1984) and gain a good deal of satisfaction from involvement in efforts to reduce energy consumption (Seligman, Becker, and Darley, 1981). Participation can also make a substantial contribution to a person's sense of well-being (Deci and Porac, 1978).

Employee involvement can be thought of as a central aspect of organizational conservation efforts. Participation, when genuinely sought, can help save energy as well as enhance an employee's feeling of responsibility and commitment toward an organization (Gatts, et al., 1974). To gain all of these benefits, a participation program must be designed to address the needs of the individuals as well as call forth their strengths. A participation program should utilize employees' information and ideas as well as their unused skills. Such a program should provide employees with the information they need in a way they can understand it. And finally, it should capitalize on the opportunity to engage their underutilized planning and problem-solving abilities. As Kaplan and Kaplan (1982:404) have noted:

People, we have argued, are capable and effective when dealing with something they comprehend. They also respond well to challenge. They benefit greatly from being needed, and conversely, the sense of being surplus must be one of the most corrosive to an individual's identity and self-esteem.

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