

FINAL REPORT

on

ALTERNATIVES TO THE OHIO ENERGY CREDITS PROGRAM

by

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by

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EXECUTIVE SUMMARY

This report discusses alternatives to the Ohio Energy Credits Program in terms of their advantages and disadvantages. The main categories covered are direct aid, utility pricing policies and weatherization. These are discussed as individual programs, and as combinations where suitable.

The Energy Credits Program is designed currently to assist elderly and disabled persons with low incomes in payment of their winter heating bills. Originally established by Amended Substitute House Bill 230, the program has since been modified by two House and two Senate bills. The Energy Credits Program is funded from the General Revenue Fund and is administered by the Tax Commissioner who coordinates the efforts of the State Auditor, County Auditors, the utility companies and the energy vendors of Ohio. Amended Substitute House Bill 230 also established the Energy Credits Advisory Committee which must report to the General Assembly on a number of aspects of the program including whether it should be continued or modified.

Direct Aid

Direct aid programs are those in which eligible persons would receive direct assistance from the state in paying energy bills. Such assistance could take the form of energy stamps, direct cash payments or government subsidized utility rates.

An energy stamps program would function similarly to a food stamps program. The stamps would be legal tender in payment of energy bills. They would be usable by all members of the eligible group regardless of the type of fuel used. A stamp program has flexibility: eligible consumers could receive equal benefits or benefits geared to their needs. Among the drawbacks of such a program are the potential for theft and the black marketeering of stamps.

Direct cash assistance has advantages similar to those of energy stamps, but differs by allowing recipients greater control over how the money is spent. Such freedom of choice is considered economically sound.

Under a system of government subsidized utility rates, eligible persons would pay lower rates than other residential customers. The resultant loss of revenues by the utility companies would be reimbursed by the state. Lower rates do not have the demeaning connotation of welfare and can be expected to be more popular than energy stamps or cash assistance in this respect. However, another program may be

needed for those eligible persons whose heating is provided by electric or gas utilities if all energy needs are to be covered.

Utility Pricing Policies

Rate structures can be designed so as to benefit a target group of customers. The utility company's revenue requirements are then met by those ratepayers who are unable to take advantage of the rate design. The benefit enjoyed by the target group may or may not be subsidized by the other customers of the utility depending on whether the new rates are based on costs.

Basing rates on cost is a fair and economically efficient method of designing a rate structure. A cost based rate design considered in this report is "time-of-day" rates and a subsidized rate structure is lifeline. Also considered are special rate classifications to assist eligible people. Another rate structure considered is inverted rates. Whether or not inverted rates are cost based is the subject of considerable debate.

Lifeline is a general term for rate structures which provide an essential amount of energy at low cost. In its simplest form, lifeline rewards all low volume users, not aiming benefits to those in the target group. However, not all members of the target group are likely to be low volume users. Furthermore, since lifeline applies only to utility customers, a separate program would have to be devised for persons who heat with coal, kerosene, wood, and other non-utility fuels in order to cover all energy needs.

Inverted rates charge higher electric and gas prices for use by high volume consumers. Such rates encourage energy conservation, and may promote wiser energy use than declining block rates if the price charged to large users equals the current cost of producing additional energy supplies. The disadvantages of inverted rates for assisting the people in the target group are similar to those of lifeline, particularly that some of the people in the target group may have above average energy requirements.

Special rate classifications are designed to apply only to persons who meet some eligibility criterion. Assuming such a special rate is cost based, it should be instituted. Assuming such a rate is not cost based the only advantage of such a rate is that the benefits of the rate go only to the intended beneficiaries. Along with being costly to other utility customers, a subsidized rate classi-

fication would have a negative impact on the wise use of energy by all utility customers. Also a separate program would be needed for those who do not heat with electricity or gas in order to cover all their energy needs.

Time-of-day rates, which benefit persons who use electricity during off-peak periods, are intended to make rates match costs more closely, as well as promote energy conservation and reduce the rate of cost increase for electricity production. However, while these rates would lower electric bills for many members of the target group, they could raise bills for others.

Weatherization

The use of state funds to weatherize the homes of the eligible group is consistent with energy conservation goals and is economically efficient in the long run. Weatherization programs are relatively easy to administer and are more readily accepted than credits or welfare programs. An existing federal program already serves some of the eligible group and would reduce the cost to the state. The large start-up costs and other short term disadvantages of a weatherization program, coupled with the fact that many of the benefits of weatherization are realized in the long run, reduce the attractiveness of such a program. A weatherization program also has the possible disadvantage of leading to an unequal distribution of benefits within the eligible group.

Combination Programs

In some cases, alternate programs can be combined so as to complement their positive features and reduce their individual disadvantages. Pairing direct cash assistance with time-of-day rates, for example, extends coverage to those who do not heat electrically and still promotes conservation. Direct cash assistance combined with a weatherization program provides for benefits in both the long and short term. Other combinations have fewer advantages.

The overall attractiveness of any particular alternate program is closely related to the size of the eligible group and the level of assistance considered necessary by state policy makers. These factors must be considered in designing a program of assistance with energy bills.

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CHAPTER 1
INTRODUCTION

The Ohio Legislature has instituted a temporary program of credits to assist in payment of heating bills for elderly and disabled citizens whose incomes are low. After a trial period of two heating seasons, the present program is to be evaluated and alternatives considered. This program may be viewed as a trial program for meeting the energy needs of all low income persons. This report discusses and evaluates some alternatives to energy credits for meeting these needs.

Background

The Energy Credits Program (ECP) originated in Amended Substitute H.B. 230 and went into effect during the 1977-78 heating season. It established a system which grants heating energy credits to householders who are at least 65 years of age or are permanently or totally disabled. Subsequent legislation enlarged the eligible group. H.B. 937 included house-trailer dwellers and eased the deadline for receipt of applications from eligible persons. The amount of income a household could earn and still be eligible for the program was increased by Amended Substitute H.B. 1073, further enlarging the target group. At the inception of the program income eligibility was determined from the previous year's income. Substitute S.B. 493 expanded eligibility to include those whose current income meets the guidelines. It eliminated the lag

in benefits for those whose past year's total income exceeded the allowable amount: those newly fallen below the designated income level. Most recently, benefits were extended (by Amended Substitute S.B. 523) to include persons whose energy use is not separately metered ("master metered") but who otherwise qualify for the program. At this writing, the head of a household who is at least 65 years old and/or permanently or totally disabled and whose current total income indicates that his entire income for the year will not exceed \$7,420 is eligible for the program. Of this group, those whose primary source of heating energy is separately metered utility service receive a 25% discount on winter usage: that is, for bills rendered in December, January, February, March and April. Those who are not separately metered or who are heated by non-utility energy (fuel oil, coal, wood, kerosene) receive a direct single payment of \$87.50 for each heating season on or before March 1 from the Auditor of State.

The program is administered by the Tax Commissioner who coordinates the efforts of the State Auditor, the County Auditors and the utility companies and energy vendors of Ohio. It is funded entirely from the General Revenue Fund and therefore does not create a price increase for other utility customers. The start of the program was buttressed by a one time acceleration of the collection of the 4% tax levied on the intrastate gross receipts of electric light, gas and natural gas companies and the 6% tax levied on the intrastate gross receipts of pipeline companies which operate in Ohio. Companies which

have credited customers with the 25% discount are reimbursed by credit toward the public utility excise tax liability for the total amount of bill reduction given.

The original legislation (Amended Substitute H.B. 230) also created an Energy Credits Advisory Committee consisting of the Chairman of the Public Utilities Commission of Ohio (PUCO), the Consumers' Counsel, three (majority) and two (minority) members of the House of Representatives, three (majority) and two (minority) members of the Senate, plus a chairman chosen by the Speaker of the House, and a vice chairman chosen by the President Pro Tempore of the Senate. The Committee chose an executive director who, along with his staff, was to undertake the necessary work of the Committee.

The Energy Credits Advisory Committee must report to the General Assembly on the ECP, specifically regarding (1) the number of people who benefited from the program and the extent to which they benefited, (2) the impact of the act in reducing the number of uncollectible electric, gas, natural gas, fuel oil, propane, coal, wood and kerosene bills, and (3) energy pricing, and also regarding whether the program should be continued, modified or expanded.

Alternatives

A necessary factor in such a determination is an examination of the alternatives to the Energy Credits Program.

This report examines the broad categories of alternatives to the ECP in terms of their advantages and disadvantages. It is not an in-depth analysis of these alternatives, nor does it analyze the appropriateness of these alternatives using specific Ohio data. It gives a general overview only.

The alternatives to be examined in this report are direct aid, utility pricing policies, and weatherization. Direct aid includes government subsidization in the form of energy stamps, direct cash payments, or discounts on utility heating bills for the target group of interest. The examination of utility pricing policies addresses itself to changes in rate structure which could be of benefit to the target group. Finally, weatherization, a method of reducing heating bills in the long term, is discussed in terms of its ability to assist in meeting the energy needs of the target group.

The factors considered in evaluating the various alternative programs include:

- (1) who will benefit--whether most of the qualified group will be reached, and whether unqualified persons can be excluded;
- (2) the extent of benefits for recipients--whether all receive equal relief and whether the amount of the benefits varies with the needs of the recipient;
- (3) the costs of the program and who pays these costs;

- (4) the economic efficiency of the program; and
- (5) the consistency of the program with conservation goals.

CHAPTER 2

DIRECT AID

Under direct aid policies energy consumers would receive direct assistance from the state in paying their energy bills. This assistance could assume several forms: energy stamps, direct cash assistance and government subsidized utility rates. The Energy Credits Program itself is a combination of government subsidized utility rates and direct cash assistance.

An energy stamp program would be similar to the current food stamp program. Energy stamps could be bought by the people in the eligible group at specified locations throughout the state. The stamps could then be used as legal tender in the payment of energy bills.

Direct cash assistance programs are those in which people in the eligible group would receive a check each month from the state. They would receive enough cash to keep the proportion of their income spent on energy about the same as it was at some specified date. However, they would not be required to spend this money on energy.

A program of government subsidized utility rates is one in which utility bills are lowered for the people in the eligible group. The revenues lost by the utility would then be reimbursed by the state, not by other rate-payers. For example, eligible electric customers would

enjoy lower rates for some or all of their electric consumption and this would be made up by the state from the general revenues.

All direct aid programs share a common advantage and disadvantage. The advantage of direct aid is that it can be targeted to a specific group of energy consumers. Persons outside the target group would not receive the aid. Direct aid programs all share the common problems of determining correct eligibility and protecting against fraud. As a result, these programs require various amounts of paperwork and associated administrative costs. These costs add to the total cost of the program and the application procedure may act as a deterrent to some people for whom the program is intended.

The advantages and disadvantages of specific programs of direct aid are discussed in the following sections.

Energy Stamps

Energy stamps are a direct aid alternative to the Energy Credits Program. The energy consumer in the target group would receive the stamps from the state and would then use them to help pay energy bills.

Energy stamps have several advantages. Some of the people in the target group do not use utility energy, electricity or natural gas, for space heating. Unlike programs directed solely at utility customers, an energy

stamp program could be used with any fuel, thus allowing all qualifying Ohio residents to take part in the program. Also, the value of energy stamps issued could be matched to the need for stamps. For example, persons with all electric homes usually have higher heating bills in the winter heating months than those with gas heat. The value of energy stamps sent to these individuals could be adjusted, if desired, to meet this need. The value of stamps sent out could also vary with location, time of the year, or the weather.

A desirable quality of any program designed to aid a specific group of people is the ability of that program to benefit the people in the eligible group and not benefit persons outside the group. Energy stamps, like other direct aid programs, satisfy this requirement.

An energy stamps program has the advantage of being able to provide an equal level of benefits to all eligible consumers. However, as noted earlier, another benefit of an energy stamps program lies in its ability to adjust to individual needs. Thus, legislators must determine whether the program should be adjusted to fit individual needs or to serve all eligible group members equally. The extent of flexibility of the program will naturally be constrained by cost considerations. An energy stamps program also has the advantage of being subsidized by taxpayers, not ratepayers.

Energy stamps also have several disadvantages. Administrative costs of programs similar to the energy stamps program, such as a food stamp program, tend to be substantial. The overall cost of the program would vary with the value of the stamps issued. Another problem could be the development of a black market for the stamps. A black market would partially defeat the program's attempt to lower energy costs for the target group. This is because the "real" price of energy to the eligible group member would be increased above the purchase price of the energy stamps. The effective price of energy would be somewhat higher than was originally intended under the energy stamps program. Also, the profits received from selling the stamps would be shared by the buyers in the black market, most of whom would not be members of the eligible group.

These results are not necessarily undesirable from the viewpoint of economic efficiency. Many economists believe that a black market would actually allow for a more accurate appraisal of the value of energy in relation to other goods. However, even if a black market in energy stamps provides cash to the eligible group, a program of direct cash assistance would accomplish this more efficiently and effectively. Protecting against a black market and other types of fraud (such as counterfeiting) may be an additional cost of an energy stamps program.

Aside from the possible development of a black market, an energy stamps program would be less efficient economically than direct cash assistance because it would effectively lower the price of energy in relation to other goods. Economists believe that the price of a unit of a good should be equal to the incremental costs incurred in producing that unit. That is, the price of a commodity should be equal to the additional cost associated with producing an additional unit of the commodity. This is referred to as the marginal cost of the unit. Thus, energy stamps may reduce economic efficiency and lead to resource misallocation. The extent to which resources would be misallocated (i.e., over used or under used) would depend upon the responsiveness of consumer demand for energy to a change in price. In economists' terms this is the price elasticity for the economic good, in this case, energy. If the response is small then the good is relatively price inelastic and the misallocation would be small. If the price elasticity is large and the number of consumers affected is large, then the misallocation would be great. It is very likely that the price elasticity would be small for small volume energy users. Nevertheless, there will be some misallocation of resources. The lower price of energy may cause eligible group members to increase their use of energy and thus also the resources used to produce it. This would negatively affect energy conservation goals.

One measure of the success of any social program is the extent to which those persons eligible for the program participate in it. Many of the eligible group members may regard the energy stamp program as a dole which they consider objectionable. In this regard, an emergency fuel stamps program for fuel oil and coal in Pennsylvania is illustrative. After eleven weeks, \$30,000 of the \$180,000 available in benefits were still available. Some of the eligible elderly persons told newspaper reporters they did not want a handout. Other problems in allocating the benefits may also arise. The stamps could be stolen if they are mailed. Also, allocating the stamps through distribution centers located throughout the state will inhibit eligible group members who are not mobile.

Direct Cash Assistance

Another alternative to assist the eligible group would be to expand the current welfare program to include those target group members who are not already on welfare. Alternatively, the welfare benefits could be increased for those recipients already in the target group to help meet the rising costs of energy. This would be a direct cash assistance program.

An advantage of this program, like some others, is that it could be offered to all qualifying Ohio residents, not just those who are electric and gas customers. People

using fuels such as LPG, fuel oil, coal and wood could also benefit.

Like energy stamps, a direct cash assistance program could be designed to provide eligible group members with an equal amount of aid. However, this would not take advantage of the fact that the program can be flexible to meet individual needs. Another benefit of the program is that it can easily be designed to benefit only those persons who are eligible for aid.

A major advantage of a direct cash assistance program is that it is the most economically efficient method of providing assistance to the target group. The reason for this is that instead of altering energy prices, it alters income. The eligible group members are given sufficient income to maintain the same proportion of their income spent on energy today as at some specified date. If they prefer to spend a greater proportion of their income on heavier winter clothing or some other good, they can do so. This results in a more economically efficient use of energy. Under a direct cash assistance program the prices for energy could be equal to marginal costs without overburdening members of the target group. Allowing the price of energy to be as close as possible to its marginal cost will allow energy markets to resemble some of the more competitive markets for other goods. Most economists believe that more competitive markets

are associated with a more efficient use of resources. Also, many economists believe that an income subsidy such as a direct cash assistance program will lead to a higher level of consumer satisfaction than a price subsidy would. This is because the free choice associated with a direct cash assistance program allows the consumer to allocate his income in a way that best meets his own individual needs. While a price subsidy for energy may enable the consumer to purchase energy at a lower rate, an income subsidy allows him to purchase those goods which have the highest value to him. The criterion of economic efficiency is important when evaluating alternatives to meeting the needs of the target group in order to avoid the over or underproduction of energy which would result in lower productivity in the economy. For the same reason, a direct cash assistance program does no damage to state and national energy conservation goals. From a conservation viewpoint, it is a preferred program.

The administrative costs of a welfare expansion alternative could possibly be substantial. Costs of current welfare programs in various states support this hypothesis. There is no reason to believe that an expansion of the existing program would lead to any economies of scale.

Going to a welfare office and standing in line could be difficult for some people who would be eligible for benefits. An outreach program where caseworkers are sent to the homes

of the elderly and disabled poor would be necessary and would add to the overall cost of the program.

The nature of the eligible group provides some insights as to the probable success of the program. Many of the people in the eligible group, particularly the elderly, are not people who are caught in a poor financial situation because of a lack of planning or prudence. They are simply victims of an inflation they could not anticipate. It is difficult therefore for some of the eligible group members to turn to the government for assistance for reasons of personal pride. For this type of individual a welfare expansion program would probably not be successful. Again, the Pennsylvania emergency fuel stamp program is an example of this lack of participation.

The other problems associated with any direct cash assistance program are likely to be present: those of allocating and distributing the benefits. As mentioned, reaching welfare offices may be difficult for many of the people in the eligible group. Also, theft of the benefit checks, if they are mailed, is a possibility although not as serious a problem as with energy stamps.

Finally, although the free choice associated with direct aid may be the most efficient way to meet the needs of the eligible group, it may not be socially desirable. The money could be used to purchase goods which are considered undesirable by taxpayers.

Government Subsidized Utility Rates

Under government subsidized utility rates the people in the eligible group would be charged less per kilowatt-hour of electricity or per thousand cubic feet of natural gas. For this particular program the rates would be set below costs for all or part of their energy usage. The revenues lost by the utility would be recovered from the state's general revenues.

The advantage of this alternative is that while many of the people in the target group might hesitate to accept direct welfare, they would more readily accept lower utility bills. The administrative costs of the program would arise mainly from the yearly determination of eligibility. The costs would be no more than, and possibly less than a direct aid program.

The total cost of a program of government subsidized utility rates could be adjusted by changing the level of benefits the eligible group would receive. The advantage of this program over lifeline, its ratepayer subsidized counterpart, is that the revenue loss to the utilities is recovered from the state's general revenue fund, rather than from other utility ratepayers. Hence, the burden is spread more equitably, and energy costs for other consumers are not artificially raised.

The extent to which government subsidized utility rates would affect energy conservation goals would depend on the

amount of subsidy and on whether the subsidy is tied to the level of energy usage. The latter case amounts to a rate structure alteration. Nevertheless, any subsidy directed at energy only would effectively lower energy prices relative to other goods and would have an effect, however small, counter to energy conservation goals. Lower prices for energy use might well cause an increase in energy consumption. However, energy consumption at low usage levels is relatively price inelastic: a drop in rates at low usage levels for a small segment of the population would not result in a large change in state energy consumption patterns. Under these conditions the detriment to state energy conservation goals would not be significant. However, if a large group of persons were eligible for the program the effect on state energy consumption patterns could be significant.

Another problem associated with a program of government subsidized utility rates is its inability to serve the members of the eligible group in an equitable fashion. An additional program may be needed to serve consumers who heat with fuels other than electricity or natural gas if all energy needs are to be covered.

A special subsidized rate structure for the eligible group would not be as flexible in meeting individual needs as other direct aid alternatives. For example, the eligible customer may head a large household which may not receive the needed benefits because rates apply to households rather than to

individuals. Adjusting such rates to vary with the number of individuals in the household would be difficult and costly.

Economic efficiency would be reduced under a program of subsidized rates because the price of energy would be below costs, at least for some initial levels of energy usage. The exact extent of resulting resource misallocation would depend upon the rate structure and the various price elasticities at the specific energy usage levels.

CHAPTER 3
UTILITY PRICING POLICIES

Utility pricing policies could be modified to assist target group members. The structure of utility prices can be one of several forms, including rate structures which are based on costs and those involving subsidies.

Subsidized rate structures can be of two categories: rates subsidized for a specific class of customers and rates subsidized for a specific range of energy usage. These lower rates would be subsidized by other ratepayers. (Lower rates subsidized by the state would be a direct aid alternative as discussed in Chapter 2.)

Cost based rates are designed to be as close as possible to the cost of providing electricity and natural gas to each category of customers. Thus, rates could differ according to the voltage level or location of the customer, or rates could vary with the time of day that energy is used. For example, only if the cost of providing service to elderly persons were lower than the same costs for other customers would rates for the elderly be set at lower levels.

Cost of Service

With regard to utility pricing policies, a brief review of the cost basis for rate structures is in order.

Most public utility experts agree that basing rates on costs is the only fair and efficient method of determining rate structures. Deviation from the cost based principle of "fairness" leads to conflicts among various other standards of equity and fairness.

Even when it is agreed that basing rates on costs is proper policy, determining whether a rate structure is or is not cost based is very difficult for several reasons. The cost of serving customers varies at least minutely for each individual customer. Cost differences arise from many different patterns of customer usage at many different locations. The problem becomes even more complex when attempting to incorporate these cost differentials into a single tariff applicable to a large group of customers.

Furthermore, there is a lack of agreement on how costs should be calculated. Adding up the incremental costs of providing service to individual customers will not yield a result equal to the revenue requirement of the utility. This is because the only costs which can be attributed to a specific customer or a group of customers are the incremental costs of providing energy service to those customers. These incremental costs do not include the "sunk" or fixed costs which the utility incurs before providing any customer or group of customers with energy service. In the economists' terminology this is equivalent to differentiating

between marginal costs (incremental costs) and average costs (which include the fixed components). Thus, adding up all the costs attributable to groups of customers or to individual customers would not allow sufficient revenues for the utilities to meet all their costs and earn a "reasonable" rate of return on their investments. Beyond this, there is disagreement over whether the original, historic cost of equipment in use or the current replacement cost is a proper basis for rate design.

Furthermore, even among those who can agree on the solution of the difficulties listed above, there is wide disagreement on how the joint costs of facilities for producing, transmitting and distributing energy should be allocated among the various classes of users.

The net result of these difficulties in determining costs for ratemaking is that there are widely varying rate designs and price levels which are purported by various advocates to be cost based. In short, a wide range of rate structures have at least some claim to being cost based. Outside of this range are rate structures universally recognized as intentional subsidies.

The Utility Pricing Alternatives

One attraction of using utility pricing policies instead of the direct aid programs is that the administrative costs associated with altering rate structures may be lower

than the administrative costs associated with government subsidy programs. If rates are structured so as to subsidize all low volume users of electricity and natural gas, the administrative costs of the program are negligible. Many "lifeline" rate proposals take this approach. This advantage does not pertain, of course, to programs in which only certain eligible ratepayers are affected by the special rates. Then, the administrative costs for the utility of determining eligibility could be significant.

Another advantage of using rate structures is that while some people in the target group might be reluctant to receive aid directly from the state they would readily accept lower utility rates.

A disadvantage of changing utility pricing policies to lower energy bills is that such a program would assist all energy needs of only those people who are heating customers of electric and gas utilities. People using fuels such as coal or fuel oil for heating would not receive the same level of benefits as those who heat with electricity or natural gas. A further disadvantage is that rates for households are not adjusted to meet individual needs. These disadvantages would reduce the effectiveness of altering utility pricing policies in providing assistance to the target group.

Several utility pricing policy changes, which have a potential for lowering some energy bills, are lifeline rates, inverted rates, special rate classifications, and time-of-day pricing.

Many public utility rate analysts contend that lifeline rates and inverted rates are two names for the same rate form. As the terms are used here, a lifeline rate form contains a rate below cost for essential energy use and may or may not have a cost based rate for additional energy use. An inverted rate form, on the other hand, sets a tail block rate above historic average cost for the customer class, often a rate equal to marginal cost, and may or may not have a cost based rate for initial energy use. Lifeline rates are proposed by those seeking to help the poor to meet the costs of minimal energy usage, and inverted rates are proposed by those attempting to promote energy conservation and reduce the need for new, high cost energy production and transmission facilities. Lifeline advocates usually admit that their proposed rate involves a subsidy, but inverted rate proponents often contend that the inverted rate is cost based. When advocates of both rate forms join forces, the rate proposed will be below average cost for initial consumption and above it for additional use. Then, the distinction between lifeline and an inverted rate becomes unclear.

Lifeline Rates

Lifeline is a general name for several rate structures designed to provide the energy consumer with essential energy at a low cost. Lifeline rates, depending on the

particular form, are often considered an example of a subsidized rate structure. The lifeline rate structure considered here involves subsidization by other ratepayers.

As with other utility pricing policies applicable to all residential customers, lifeline rates as an alternative to the ECP have the advantage of low administrative costs. A lifeline rate structure would be readily accepted by the target group, because it would apply to all residential utility customers. Thus, lifeline rates could provide assistance without the possibly demeaning aspects of a welfare expansion program or energy stamps.

Energy conservation goals would probably be served if the initial low lifeline block rates were followed by a tail block priced above cost. Low rates for initial energy use followed by "normal" rates for further usage would not promote energy conservation. Thus, as with government subsidized utility rates the net effect of lifeline rates on energy conservation would depend on the rates for usage outside the lifeline block.

The success of a lifeline rate structure in providing assistance to the target group will be affected by the manner in which the program addresses certain questions. Examples of these questions are: What should be the length of the lifeline block? Which utilities should be covered? Will lifeline be available to all residential customers? What should be charged for lifeline service? What should be the lifeline breakeven point? How should revenues be

recovered? Some of these questions can be answered, at least partially, by attempting to design the lifeline rate structure to benefit the target group more than it benefits others.

Most advocates of a policy of lower rates for initial energy use and higher for large volume use assume that the intended beneficiaries of this policy are low volume users of energy. The target group may or may not consist primarily of low volume users. If the target group members are high volume users of electricity or natural gas for heating older or poorly constructed homes, they could be penalized under this rate structure.

Consider the effect on economic efficiency. Suppose the lifeline rate structure is set up in such a way that the people in the target group pay lower rates while those outside the target group pay higher rates. For the people in the target group the price of energy has been effectively decreased. This may cause target group members to increase their energy consumption. Ratepayers outside the target group, facing a higher price, would probably be forced to decrease their energy consumption below an optimum level. The resulting effect on resource misallocation would be negative. The magnitude of the effect cannot be gauged without information on consumer response to the change in rates at various energy usage levels. Nevertheless, the tendency for resource misallocation will exist. The relation of price to marginal costs would depend on the

particular lifeline rate structure. In all cases it is assumed that the lifeline block rates are set below costs. Because lifeline rates result in a price subsidy, most economists would contend that consumer satisfaction will be lower with lifeline than with the free choice associated with an income subsidy.

Because resource misallocation could evolve from two sources under ratepayer subsidization a taxpayer subsidized rate structure would probably be preferable from the viewpoint of economic efficiency. There are additional reasons for preferring taxpayer subsidization. Ratepayer subsidization programs may impose a welfare burden on people who are just slightly better off than the recipients of aid. The government is a more effective agent in dealing with the problems of the poor. Also, under welfare and government subsidized programs costs are clearly identified.

As with other rate structures, it is difficult for lifeline to accommodate individual needs.

Inverted Rate Structures

An inverted rate structure is designed so that rates increase in a stepwise fashion with increasing energy use. The tail block rates would be priced above average cost, possibly at marginal cost. Initial rates would be lower, possibly chosen to meet the utility's revenue requirement. While there is considerable debate over the degree to which

such a rate form is cost based, all agree that it would result in lower utility bills for initial energy consumption than would declining block rates.

An inverted rate structure would have a positive impact on energy conservation. Increasing rates for high level energy consumption discourages high volume use of energy. The possibility exists that the decrease in energy use could be quite substantial. Advocates of inverted rates believe that high volume use of energy is more sensitive to price than low volume use, and that a decrease in rates for initial energy use will not offset the energy savings from the high tail block rate.

An inverted rate structure would be economically efficient to the extent that the price of energy as set by this rate structure closely followed the marginal cost of producing this energy. A rate equal to marginal cost for all but initial consumption would be more economically efficient than the declining block rates now widely used. However, most public utility economists believe that time-of-day rates are a better rate form for closely following the marginal cost of producing electric energy.

If the initial block rate is set below the marginal cost, then resource misallocation can occur. The extent of the resource misallocation will depend on the sensitivity of the low volume consumer to rate changes and the degree

to which the rate differs from the marginal cost. Thus, if the demand for energy is relatively price inelastic among low volume users, the impact on resource allocation will not be substantial. However, if demand is relatively price elastic among high volume users and if energy is priced far above the cost of production, serious consumer underconsumption could result.

Additionally, using inverted rates as a method of providing assistance to the target group will result in a lower level of consumer satisfaction than an income subsidy. This is related to the concept of free consumer choice given the prices of various goods and services. An inverted rate structure may result in a price subsidy not an income subsidy.

In other ways the advantages and disadvantages of inverted rates are similar to those of lifeline. A serious drawback to using an inverted rate structure to assist people in the target group is that this policy assumes these people are low volume users of energy. People in the target group who are not low volume users of energy would have their utility bills increased by an inverted rate structure. Additionally, a separate program may be needed for consumers who are not customers of electric and gas utilities if all energy needs are to be covered.

For those who contend that the inverted rate structure requires high volume users to subsidize low volume users, the difficulties seen arising from this subsidy will be similar to those described previously for a lifeline rate. In particular, a disadvantage of any utility pricing policy designed to subsidize certain consumer's rising energy costs is that an energy subsidy alone produces less consumer satisfaction than a general income subsidy.

Special Rate Classifications

A rate designed specifically for a particular subclass of customers is a special rate classification. Every utility has special rate classifications for groups of customers with similar cost characteristics which differ significantly from the cost characteristics of other customers. Residential, commercial and industrial customers are normally each on a separate schedule of rates related to the costs of serving each customer class. Classes are sometimes broken down into subclasses if each subclass has distinctive usage characteristics. For example, residential customers with all electric homes often receive a rate schedule different from most other residential customers because their different usage patterns result in different costs of service.

A rate structure designed to lower rates for persons whose income is less than a predetermined amount would be a special rate classification. If it can be demonstrated

that such low income consumers cost less to serve, then a special rate classification is appropriate, and may even be required if the cost difference is substantial. On the other hand, if no such cost difference can be demonstrated, the special classification becomes a subsidy. The advantages and disadvantages of such a subsidy are considered here. These rates must be subsidized by other residential customers or other classes of energy consumers. Rates subsidized by the state would be a direct aid alternative.

A special rate classification has the advantage of being able to assist directly only those people eligible for benefits. A special rate classification also has the possible advantage of being readily accepted by the members of the eligible group. However, one difficulty would be that another program would be required for people who do not heat with electricity or natural gas if all energy needs are to be covered.

A special rate classification is able to provide an equal level of assistance to all people in the eligible group. However, as with other such programs this does not allow for flexibility in the program to meet individual needs.

The administrative costs for a special rate classification would be far higher than those for other rate structure changes. The state or the utility would be engaged in the ongoing process of determining who is eligible for the special rates. These administrative costs would be borne by taxpayers

or by those utility customers who subsidize the special rates for the eligible persons. The total costs of a special rate classification will vary with the amount of subsidy required to allow utilities to meet their revenue requirement. The size of this subsidy would depend on the level at which the rates were set for eligible group members and the size of the eligible group. The subsidy may be paid exclusively by other residential customers. Because a specific level of income must be chosen as a cutoff point for eligibility, people just slightly better off than those eligible for benefits will subsidize persons in the eligible group.

If other classes of customers, such as industrial or commercial customers, subsidize the eligible group there will be higher prices for industrial and retail products which ultimately get passed on to consumers. Such a subsidy burden, if large enough, could be a negative factor influencing businesses deciding whether to remain, or to locate, in the state.

Such a special rate classification is not an economically efficient method of helping eligible persons pay their utility bills. Under special rates resource misallocation would arise from two groups of customers. The first group of customers would be the people eligible for benefits. If rates were set below the cost of providing energy service, the people in the eligible group would be receiving improper

price signals about the true value of energy. The second source of resource misallocation would be higher energy prices for those outside the eligible group. If rates were set above costs for these customers they may reduce too much their use of electricity or natural gas. The actual magnitude of the resource misallocation would depend on price elasticities and the amount of energy service subsidized, as well as the level of the subsidy.

For the consumer an income subsidy will result in a higher level of satisfaction than a rate subsidy, because of the greater freedom of choice allowed in spending. An income subsidy allows the consumer to purchase those goods that have the greatest value to him.

Because a special rate classification lowers energy costs for eligible group members and raises costs for non-members, the net impact on energy conservation would depend on particular characteristics of the program. However, increased rates for industrial customers could result in industry substituting the use of oil for electricity and natural gas, thus counteracting the intent of the nation's conservation program.

Time-Of-Day Rates

A time-of-day rate structure (TOD) is applicable only for electric energy. The price of electricity varies during the day as does the cost of producing it. Hence, if properly implemented, TOD could be a cost-based rate structure.

Peak hour energy is more expensive to produce not only because the most costly equipment (older or using more expensive fuel) is used to produce it, but also because the response to heavy demand usually causes costly increases in system size.

Time-of-day rates are considered here because they are an alternative to existing electricity pricing forms. Time-of-day rate structures may or may not benefit the people in the target group depending on how much flexibility they have with their time schedules, thus allowing them to adjust their electricity usage to benefit from lower priced off-peak energy.

A time-of-day rate structure can be based on marginal costs. This would serve the economists' criterion of setting price equal to marginal costs to promote economic efficiency. Because rates are closely related to costs, resource misallocation would be minimal and consumer satisfaction will not be lowered as it would under a price subsidy.

Many of the units for generating peak period electricity use higher priced fuels such as fuel oil. Time-of-day (TOD) rate schedules discourage peak period energy consumption thereby reducing the use of these precious fuels. For this reason TOD rates are consistent with energy conservation goals.

A time-of-day rate schedule, once implemented, would have low administrative costs associated with it. The total

cost of a time-of-day rate structure would also be low in relation to other programs designed to aid the eligible group.

However, there would be the additional cost of measuring the consumer's usage of energy. Time-of-day pricing meters are expensive. Thus, implementing a time-of-day rate structure could be too costly in that metering costs may outweigh expected savings.

Other problems may arise in using this rate structure to assist the target group. Some target group members may be able to adjust their time schedules more readily than others. This would lead to an unequal distribution of savings. Some may even experience losses. Also, the many persons who do not use electricity for heat would not benefit greatly from a TOD rate structure. Furthermore, since the need for electricity for heating during the winter is continuous throughout the day, the benefits of curtailing peak use may not be realizable. Thus, although TOD rates would be an economically efficient method of serving the needs of the target group, it may lack other features which are particularly desirable in serving that group.

CHAPTER 4
WEATHERIZATION

The program discussed here as an alternative or adjunct to energy credits involves the use of state funds for loans or grants to pay for insulating the homes of members of the eligible group who do not qualify for existing federal weatherization programs. Since such an undertaking is consistent with national conservation goals, it warrants serious consideration.

For the purposes of this report, the terms "weatherization" and "insulation" are used interchangeably and are intended to include insulation, weather stripping, caulking and sealing, and installation of storm windows. Existing federal weatherization programs were begun by the Energy Conservation in Existing Buildings Act of 1976 and have been extended through 1980 by the National Energy Act. They are aimed at low income families, particularly the elderly and the handicapped. To be eligible for the federal program, a family must have an income of 125%, or below, of the federally established poverty level.

A weatherization program might well prove to be the least costly to the state of all the programs in the long run. Outlays for insulation would not be tied to rising energy prices as are the discounts on energy bills.

Insulation of a dwelling provides for permanent savings of fuel and dollars and "pays for itself" within a reasonable length of time. Thus, it is the most economically efficient method of serving the eligible group.

Another attractive feature of a weatherization program is relative ease of administration. There could be only a single interaction with each eligible household rather than an ongoing series of payments. The role of the utility companies might be reduced or altogether removed from the process, and record keeping would be simplified since the amount and kind of heating energy used by recipients would cease to be a factor. The mechanism for outreach and identification of newly eligible persons could simply be continued as it presently operates with the ECP.

There may be wider acceptance of a weatherization program than a credits or welfare program by the recipient group. The removal of the utility companies as the conduit for benefits may well increase public confidence and participation. Also, participation would imply a contribution to the national conservation effort, offsetting any negative feelings associated with government assistance.

On the other hand, a weatherization program would require large start-up costs for the state and considerable financial outlay on the part of eligible persons who receive anything but an outright grant for insulation. Furthermore, it is

unclear whether the elderly members of the eligible group would be responsive either to long term commitments or long term benefits. Their concerns are understandably with the immediate future.

A corollary to the program would necessarily be the recommendation and/or licensing of insulation installers. The associated problems of liability, standard setting, and compliance by installers could delay implementation of the program to the detriment of the recipients. Existing federal standards could be used if deemed adequate by the state, but even the determination of adequacy could cause delay in starting the program.

The need to dovetail a state program with the federal one is a potential disadvantage which may counterbalance the ease of administration with intragovernmental complexity. Verification of eligible persons and completed work would have to be coordinated with the department of Housing and Urban Development, the Farmer's Home Administration, and a variety of community service organizations, all of which share in administering the federal program.

Nevertheless, at a minimum, a state program to insure that eligible Ohioans take full advantage of available federal weatherization programs would appear appropriate.

There is, however, a potential disparity of benefits to the eligible group. A weatherization program would

have the greatest impact among homeowners who have not insulated. Those who through their own or their landlord's foresight live in homes already well insulated would not benefit from the program. There would be little incentive for landlords to insulate or for renters to help improve the landlord's property. Trailer dwellers could only receive partial benefits from weatherization: their walls are not thick enough to accommodate the insulation required by Ohio's climate. This inequity of benefits to the target group may be the most serious drawback of a weatherization program if it were considered by itself as an alternative to the Energy Credits Program.

CHAPTER 5

COMBINATIONS OF ALTERNATIVES

The alternatives discussed in Chapters 2 through 4 could perhaps be employed jointly in order to meet more effectively the needs of the target group. The combinations considered first are those in which two alternatives complement each other or those in which one alternative offsets the weaknesses of the other.

The most economically efficient method of meeting the needs of the eligible group would be to combine direct cash assistance with a time-of-day rate structure. A direct cash assistance program results in an income subsidy to the eligible group. As we have seen, the income subsidy allows the consumer to use his income as he sees fit. Thus, the consumer will reach his highest level of satisfaction under a direct cash assistance program. A time-of-day rate structure can be designed to make rates conform closely to marginal costs. Thus, combining the two programs would result in a high level of economic efficiency.

The time-of-day rate structure and direct cash assistance programs also complement each other in promoting energy conservation goals. The time-of-day rate structure discourages peak period use of energy. At the same time a direct cash assistance program aids the eligible group

member by giving him sufficient income to meet the rising cost of energy without creating false energy price signals.

The direct cash assistance program allows the eligible group member to use a constant proportion of his income for energy without encouraging increased energy use. Thus, combining the two programs should further aid energy conservation goals.

The inability of a time-of-day rate structure to adjust to individual needs or to help those who do not have electric heat can be offset by the program of direct cash assistance.

A direct cash assistance program can also be used very effectively in combination with a weatherization program to meet the needs of the eligible group. This combination is perhaps the best approach. The direct cash assistance program serves the immediate needs of the eligible group members while the weatherization program meets these needs in the long run. Potentially, the benefits from a weatherization program could be great enough that the direct cash assistance program could eventually be phased out.

The direct cash assistance program could partially offset the inequities which arise under a weatherization project. For example, persons living in mobile homes that cannot be well insulated could receive additional assistance

benefits. The weatherization and direct cash assistance combination could also be easily targeted to the eligible group .

The impact of each program on energy conservation goals is positive, so the combination of the two programs would also be consistent with energy conservation goals.

Other direct aid program combinations are less attractive than direct cash assistance combinations. An energy stamp program could be combined with time-of-day rates or weatherization. However, the benefits of doing so would be no greater than under the combination with direct cash assistance. Because energy stamps result in a price subsidy the economic efficiency of the combination may be less than that with a direct cash assistance program.

Combining a time-of-day rate structure with a weatherization program will allow the eligible group member to reap the long run benefits of energy conservation along with some improvement in economic efficiency. Conserving energy now would result in a larger supply of fuels and allow for a lower price of energy in the future. However, this combination would not serve the short run needs of the eligible group.

The weatherization program could also be combined with government subsidized utility rates or lifeline rates. Again, this will allow for the immediate needs of the eligible group to be met in the interim before the full benefits of

weatherization can be realized. However, these combinations do not offer more than the combination with direct cash assistance, and they are less efficient economically.

Not all combinations of alternatives are complementary. For example, consider the current Energy Credits Program supplemented by a special rate classification. As previously noted, the ECP is already a combination of two distinct direct aid alternatives: government subsidized utility rates for electric and gas consumers, and direct cash assistance for those who heat with other fuels. What additional purpose would a special rate classification serve? The special rate classification could provide benefits to more electric and gas customers beyond those eligible for the ECP. However, the ECP as it exists could also be expanded to meet the energy needs of this larger group of individuals. If the special rate classification was simply made available only to those eligible for the ECP, the same level of benefits could be obtained by the eligible group by an expansion of ECP assistance.

The ECP is a worthwhile program because it provides state assistance without requiring one group of utility customers to subsidize another. The drawbacks of the ECP are its administrative costs and its lack of flexibility to vary the level of assistance according to the level of need of the eligible person. A special rate classification introduces a possible ratepayer subsidy, where a state

subsidy is already in place. It also requires a duplication of high administrative costs, to determine eligibility, by the state and by utilities. Also, a special rate classification would not provide any increased flexibility in meeting individual needs.

One attraction of adding a special rate classification to the ECP is that it will not result in increased burdens on the state budget in meeting the energy needs of the eligible group. However, it will directly result in an increase in rates for non-eligible utility customers through the subsidy required, assuming such a rate cannot be shown to be cost based. Also, it will indirectly increase rates through the increase in administrative costs for utilities. In addition, since a special rate classification is neither economically efficient nor consistent with energy conservation goals, adding this program to the ECP will enhance the undesirable features of each.

Summary

In this report an attempt has been made to evaluate some alternatives to the present Energy Credits Program. The ECP itself is a combination of two direct aid alternatives and is a method of meeting the energy needs of low income persons. The relevance of factors used in examining alternate programs must be evaluated when formulating public policy. For example, the effect of a particular rate

structure on energy conservation will vary with the size of the eligible group. If the group of interest is the group presently eligible for the ECP, the impact could be small. However, if eligibility were expanded to include all poor persons the impact on energy conservation would be much greater. Thus, the impact of each factor must be re-examined for alternate programs in the light of the level of assistance and the size of the group eligible for assistance.

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