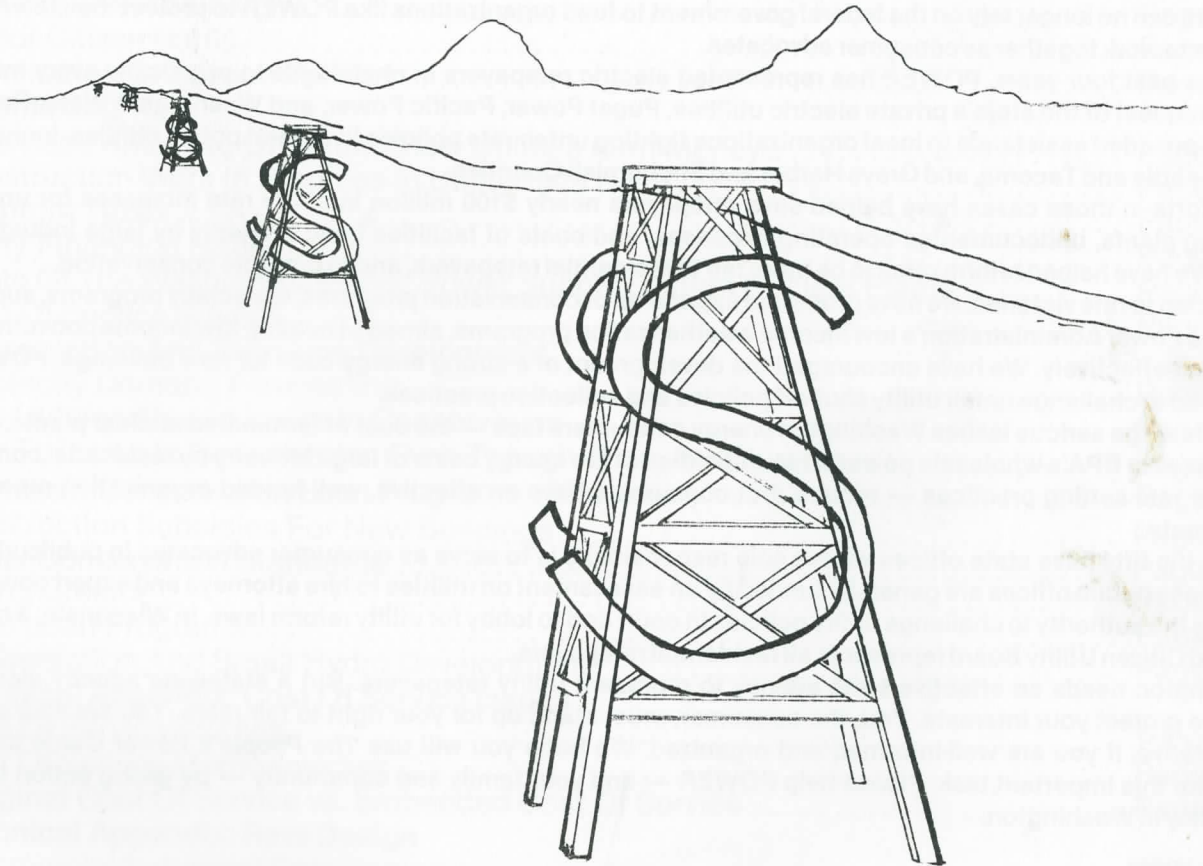


THE PEOPLE'S POWER GUIDE



K. LINK

A MANUAL OF ELECTRIC UTILITY POLICIES FOR CONSUMER ACTIVISTS

POWER

People's Organization for Washington Energy Resources

This document was prepared in 1982 by the People's Organization for Washington Energy Resources (POWER). While it is dated, the vast majority of the content remains relevant for consumer and environmental participants in the utility regulatory process. POWER was disbanded shortly after this was published. Permission for web publication granted by Michael Karp, Chairman of POWER when this was prepared.

Dear Concerned Energy Consumer:

Thank you very much for your active interest in energy issues. You and other concerned energy users have the power and the responsibility to shape the way that electricity is produced, priced and used in the Northwest — and also to affect the region's economic and social well-being. *The People's Power Guide* will help you become involved in the decisions of your utility. You can help to create energy policy which is fair to all consumers.

POWER, the People's Organization for Washington Energy Resources, has been working on behalf of low income and elderly energy users since 1978. Federal funding has assisted POWER in promoting the interests of low income and senior citizens on energy planning and pricing issues. But today, budget cuts are forcing us to face the fact that consumers can no longer rely on the federal government to fund organizations like POWER to protect their interests. It's time for us to work together as consumer advocates.

Over the past four years, POWER has represented electric ratepayers in challenges to practically every major rate increase request of the state's private electric utilities, Puget Power, Pacific Power, and Washington Water Power. We have also provided assistance to local organizations fighting unfair rate policies in several public utilities, including the cities of Seattle and Tacoma, and Grays Harbor and Snohomish Counties.

Our efforts in those cases have helped save ratepayers nearly \$100 million in utility rate increases for unfinished generating plants, undocumented operating expenses, and costs of facilities used primarily by large industrial consumers. We have helped reform rates to be more fair to residential ratepayers, and to promote conservation.

In addition to rate victories, we have promoted expansion of conservation programs, especially programs, such as the Bonneville Power Administration's low income weatherization programs, aimed at helping low income consumers save energy cost-effectively. We have encouraged the development of a strong energy code for new buildings. POWER has also worked to challenge unfair utility shut-off policies and collection practices.

We believe the serious issues Washington energy consumers face — the cost of terminated nuclear plants, continuing increases in BPA's wholesale power rates, subsidies of the energy costs of large industry by residential consumers, and unfair rate-setting practices — require that consumers have an effective, well-funded organization representing their interests.

Half of the fifty state offices whose sole responsibility is to serve as consumer advocates in public utility rate cases. These public offices are generally funded by an assessment on utilities to hire attorneys and expert consultants. They have the authority to challenge utility policies in court and to lobby for utility reform laws. In Wisconsin, a ratepayer controlled Citizen Utility Board represents all residential ratepayers.

Washington needs an effective state agency to represent utility ratepayers. But a statewide agency alone is not enough to protect your interests. You, the consumer, must stand up for your right to fair rates. You are your own best representative, if you are well-informed and organized. We hope you will use *The People's Power Guide* to prepare yourself for this important task. Please help POWER — and your family and community — by taking action to reform utility policy in Washington.

Sincerely yours,



Michael Karp
Chair of the Board

THE PEOPLE'S POWER GUIDE

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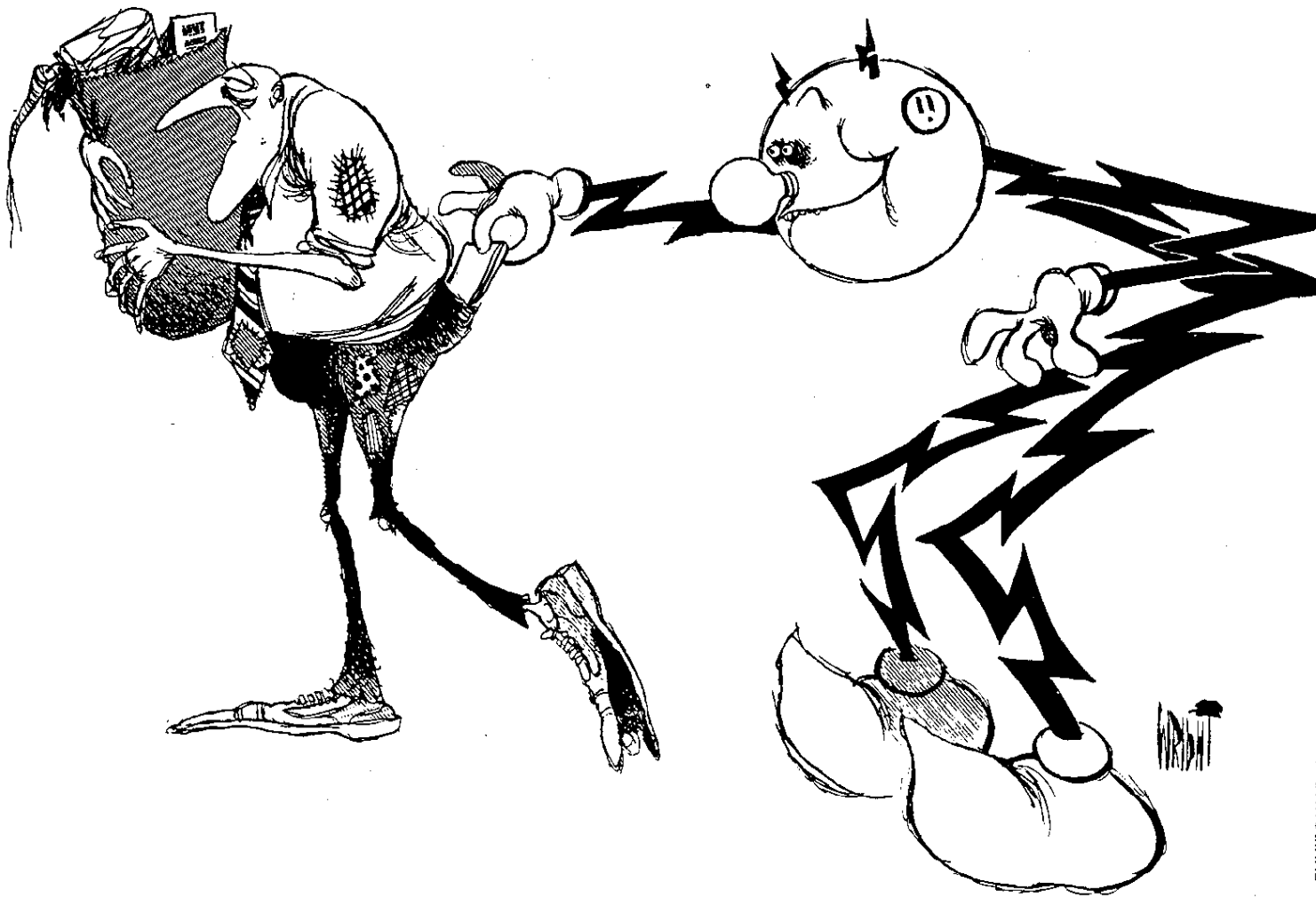
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HOW TO USE THIS CONSUMER MANUAL

If you want to improve the way your power company works, we wrote this manual for you. You can use it as a tool for protecting the interests of low income and senior ratepayers, for promoting energy conservation and renewable resources, for holding down future power costs and for restoring public participation in the energy planning process. It will help you become a more informed and active consumer.

We have tried, wherever possible, to present information and ideas in non-technical language for any interested and concerned ratepayer. Certain topics, however, require a more technically detailed explanation than others. For example, the technical appendix on cost of service issues is designed to show consumers the weak points in complex computerized studies used by utilities in allocating costs to different customer classes. Because of its complexity, we put it in a separate section at the end of the manual.

The first manual articles introduce basic concepts of intervention and rate-setting. Later articles use these con-

cepts to explain larger issues of energy planning, finances and rate design. Most articles end with a summary; you may want to skim these for a general sense of what each article describes. Once you have a strong understanding of the fundamentals of electric utility policy, you may want to study the more technical issues in preparing for a rate case.

If you are a part of a group working to reform your local utility, you may want to divide responsibility for researching the various issues the manual addresses. You can find out, for example, how your current rates are structured, what kind of programs your utility currently provides for seniors and low income ratepayers, and what conservation programs it offers.

As active consumers, your position will be stronger if you understand the many different issues involved in energy decision-making. We hope you find this manual useful in learning how to reform energy policy. Please let us know what you think of the manual, and what we can do to make it more useful for consumers.

INTRODUCTION

Between 1979 and 1982, electric rates for most Northwest public utility ratepayers have more than doubled. They will double again in the next two years to cover the cost-overruns and termination expenses of the five WPPSS plants. Private utility customers face payment of the \$600 million their power companies have invested in the Skagit and Pebble Springs nuclear plants. All electric ratepayers will feel the pinch of these tremendous increases in rates, but the increases will be most devastating for low income ratepayers, for senior citizens living on fixed incomes and for people who are laid off or between jobs. Northwest ratepayers face greater expense than other Americans because this region is more dependent upon electricity than any other part of the U.S. Utilities in the Northwest frequently compare our "low" rates with much higher rates in other parts of the country, but this kind of comparison ignores the fact that Northwest ratepayers use much more electricity than the average residential customer nationally.

The typical Northwest public utility ratepayer uses about 20,000 kwh per year, at a cost of about 2.5 cents per kwh; the average annual bill is therefore about \$500, an amount which will double in the next two years. If ratepayers do not reduce their use of electricity, the average residential consumer will pay \$1000 per year for electricity by 1984. Electric heat customers living in underinsulated homes will pay much more, since they use far more than the average amount of electricity.

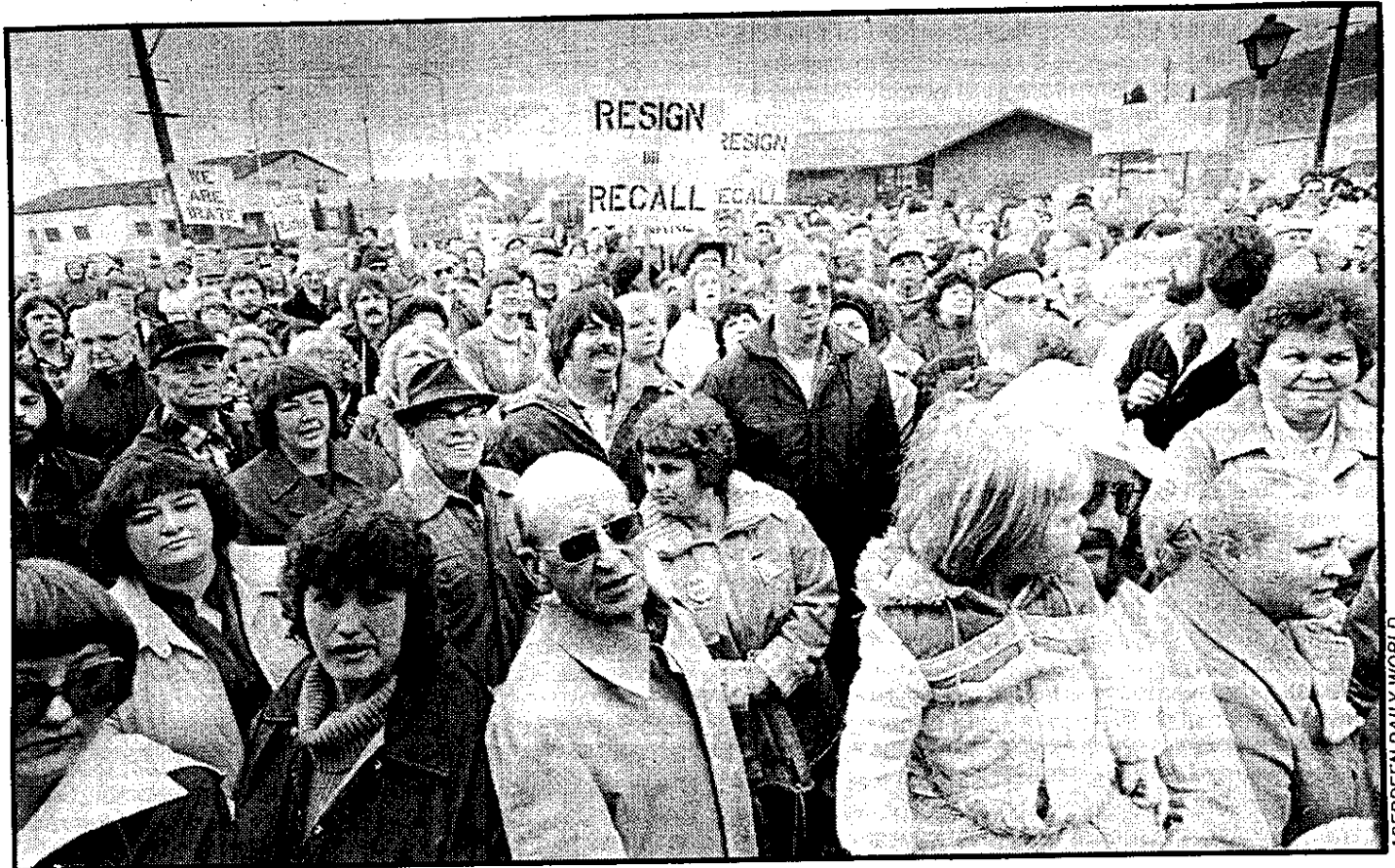
Nationally, the average residential ratepayer uses about 6000 kwh per year, at an average rate of 6 cents per kwh; the average annual electricity bill is about \$360, or one third less than the current average Northwest bill. Rate increases nationally are expected to average about 12% per year for the next two years; as a result, by 1984, Northwest ratepayers will spend about twice as much on electricity as the average American ratepayer.



Consumers have many opportunities to work to control their power costs. Restructured electric rates can promote energy conservation and reduce the need for rate increases. This will help make energy more affordable, will improve lifestyles, and will discourage wasteful energy practices which drain funds away from more productive economic uses.

PARTICIPATING IN UTILITY DECISIONS

YOU CAN AFFECT YOUR UTILITY: YOUR RIGHT TO PARTICIPATE



ABERDEEN DAILY WORLD

You can affect the decisions that determine your electric bills by becoming an informed and active participant in the rate-setting process. The way you can participate in the decision-making of your local utility depends upon what kind of utility serves you. If you are served by a Public Utility District or Municipal utility, your local utility is a public agency of the state, and must allow you to participate at almost every step of the rate-making process. If you are served by a private utility, such as Puget Power, Pacific Power, or Washington Water Power, the utility is regulated by the Washington Utilities and Transportation Commission, which has established clear procedures allowing you to participate in certain ways. If you are served by a mutual or cooperative power utility, you elect the Board of Directors, and they establish procedures for public involvement.

Utilities usually begin the rate process by having their staff or consultants determine their revenue requirements (how much money they will need) and their cost of service (who should pay how much). Consumers must be involved

at this step of the process, as the assumptions underlying such studies often determine the outcome of the overall rate-setting process.

Residential ratepayers have very different interests in ratemaking than do industrial customers. Industrial customers are often less concerned about the size of the rate increase, but more concerned about which customer classes must bear the largest portion of the increase. Their technical sophistication often makes them formidable opponents of small consumers in the competition over "who pays."

Residential customers' interests in rate-setting are very similar to the interests of small, local businesses, and so these two groups of customer classes may form a valuable coalition. Since small businesses often have strong ties to the utility regulators, particularly in the case of municipals, PUDs and co-ops, they can be important allies in attempting to get rates structured fairly.

PRIVATE UTILITIES

Washington has three private, stockholder-owner electric utilities. Puget Power serves about 1.3 million people living in the Puget Sound area. Washington Water Power serves about 500,000 people in the Spokane area. Pacific Power serves about 300,000 people in the Yakima and Walla Walla areas. The private utilities are managed by private boards of directors, elected by stockholders. Their meetings are closed to the public, and information about their plans and programs is often difficult to obtain.

These utilities are regulated by the Washington Utilities and Transportation Commission (WUTC), a state agency. If the private utilities want to increase their rates, or to change their service policies, they must first get permission from the WUTC. The WUTC schedules public hearings on proposed rate increases or other tariff changes, and establishes a process for public participation for each proceeding. WUTC rate proceedings are carried out very much like a trial, with all witnesses being sworn, lawyers asking questions and a court reporter taking down every word that is said.

In the case of major rate increase requests, the WUTC appoints a "Public Counsel," an attorney whose entire job is to represent the interests of consumers. The cost of the Public Counsel is paid by the utility requesting the rate increase. The utility must send a notice of the proposed rate increase to all ratepayers, notifying them of the time and place of hearings, and providing the address of the Public Counsel, where they can obtain further information.

Any interested ratepayer or ratepayer group may intervene in the case. Intervenor can obtain copies of all information filed with the WUTC, and have the right to cross-examine the utility witnesses. Intervenor often include POWER, which represents low income and senior citizens, and WICFUR (Washington Industrial Committee for Fair Utility Rates) which represents large industrial customers.

The rate increase proceeding begins with the utility's presentation of its request for a rate increase, followed by testimony by the company experts on the reasons for an increase. All participants in the proceeding, including the Public Counsel, are given an opportunity to cross-examine the utility employees and experts.

After all of the utility witnesses have appeared, other parties have an opportunity to digest the information they have requested of the company. They then present their own witnesses, who generally oppose all or a portion of the costs that the utilities are asking ratepayers to pay. These witnesses are subject to cross-examination by the utilities lawyers, and by other participants as well.

The WUTC staff appears as an independent body during the hearing process. Staff members present their own opinions in their testimony. The UTC staff generally attempts to reduce the rate hike which is requested by the utility.

At this point in the proceeding, public hearings are held in the service area of the affected utilities. The Commission schedules several hearings in different parts of the service area. The Public Counsel prepares a summary of the major issues in the proceeding, so that individual ratepayers will have a grasp of the technical issues discussed in the expert testimony.

After all parties and the public have had an opportunity to testify, the company presents rebuttal testimony. The Com-

missioners then evaluate all of the testimony and issue an order, generally allowing the utility a portion of the rate increase it has requested, and denying other portions. The final decision, or order, of the WUTC, is subject to appeal through the courts, but it is usually allowed to go into effect while any court appeals take place.

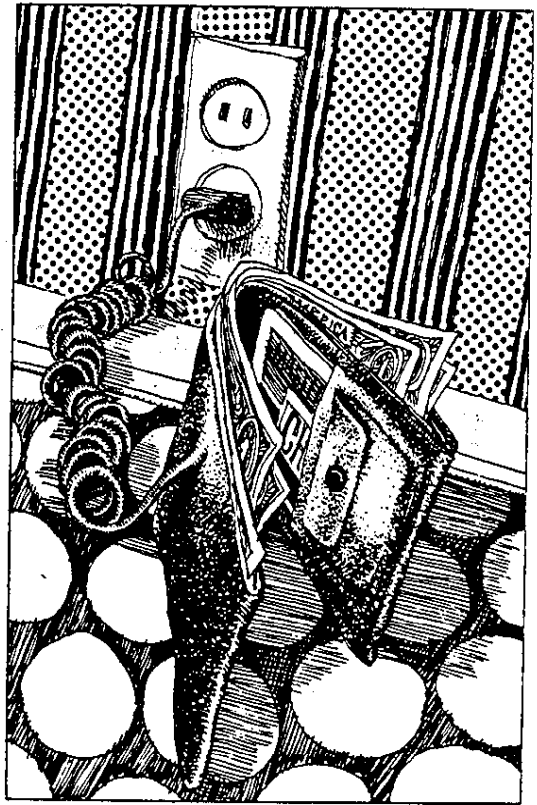
By law, the WUTC has up to eleven months to consider a rate increase request. Usually, two months elapse between the time the company requests the rate increase and the time the company witnesses give their testimony. Another two months go by before the staff and intervenor witnesses take the stand. After about another month, the company delivers its rebuttal testimony. Finally, the Commission takes about a month or two to evaluate the testimony and to issue an order.

In addition to the formal hearings on rate increases requested by the utilities, the WUTC holds hearings on complaints against utilities from ratepayers. These complaints can range from disagreements over who should pay for trimming trees which are interfering with utility lines to complaints about utilities' continued investment in nuclear power plants.

The proceedings on complaints are very similar to those for rate increases, although they are often shorter and less complex. Even in complaints, however, the public has a right to raise any issues it wants, the company must respond, witnesses are placed under oath, and a final decision is made based upon the information contained in the written record.

The complaint procedure is very valuable to ratepayers, as they can use it to force the utility to respond to any grievances which may be raised about utility rates, practices or policies.

AUDUBON



PUBLIC UTILITY DISTRICTS

Public Utility Districts are separate units of local governments, established for the sole purpose of providing utility services. Most provide only electric service; some provide water service as well. A few provide water service only, and a few are totally inactive but still legally organized.

PUDs were created by Initiative #1, sponsored by the Washington State Grange during the Great Depression. At that time, private utilities held great political power, and refused to provide service to the rural areas of the state. The establishment of PUDs brought electricity to parts of Washington which had never had electric service.

Most of the PUDs purchase all or most of their electric supply from the federal Bonneville Power Administration, which markets power from the federal hydroelectric dams and from the first three WPPSS nuclear plants. Some PUDs (such as the Grant, Chelan, Douglas, and Pend Oreille County PUDs in Eastern Washington, and the Cowlitz County PUD in Western Washington) also generate their own power.

PUDs are governed by Commissioners, elected by the people in the local county. Commissioners are usually elected on a county-wide basis, even if the PUD serves only a portion of the county. Most PUDs have three Commissioners serving six-year terms, so that one position comes up for election in each even-numbered year.

Because PUDs are public agencies, all of their meetings are open to the public, except for meetings dealing with real estate, litigation, or employee matters. Any citizen may ask to be notified of these meetings and may attend them. While PUDs are not required to accept public testimony before taking action on items at open meetings, they are often willing to listen to the public on any topic which is relevant to their responsibilities.

When PUDs plan to increase rates, they usually develop a proposed rate structure for the increase, either by using their own staff or by contracting with a specializing consultant. If you ask the PUD to inform you whenever a staff study is begun or a consultant is solicited, you can keep abreast of the process, offer suggestions during the course of the development of the staff proposal and more actively promote the consumer perspective.

In the past, PUDs have often ignored the public's point of view during rate hearings, allowing public testimony only "for show," and then approving whatever the staff or consultant had proposed. This practice stems from a belief that only experts can develop appropriate utility rates. With greater consumer interest, however, PUDs have begun to be more responsive and are listening much more closely to their consumer/owners.

Some PUDs have established "citizen advisory committees" which are involved in the rate-setting process. Such advisory committees should be well enough funded to hire their own consultants to represent consumers' interest in the development of rate proposals. As this manual details (see the technical appendix on cost of service issues), there are many different ways to set rates, some of which benefit residential consumers and help promote conservation, and others of which promote the wasteful use of energy, or benefit industrial power users.

Since PUD Commissioners are elected, they tend to be somewhat responsive to public demands. However, some

PUD Commissioners in the past have discouraged activists by ratepayers attempting to influence the operation of the utilities. If such a situation arises in the future, consumers must be particularly careful to communicate their point of view to the public.

As special agencies of local government, PUDs have limited powers. Under the law, they are allowed to purchase, generate, sell, and transmit electrical energy, to distribute water, to provide sewer services and to assist in financing energy conservation programs. They cannot do some things which might be useful as a part of an overall energy policy, such as establish building codes. Only cities and counties have that authority.

MUNICIPAL UTILITIES

Municipal utilities are controlled by the elected City Council, although the Council sometimes delegates this control to an appointed Utility Board. Direct control by the City Council usually results in policies which promote the public welfare, simply because council members are responsible for the total well-being of a city, and are less likely to regard utility operation as a strictly technical subject. City officials recognize that all energy decisions are at least in part political, affecting the lives of the people in the community.

Municipal utilities are public agencies, and as such must conduct all of their business in public. Any citizen can ask to be notified of meetings, to receive copies of internal studies and documents and to attend any and all meetings (except those having to do with real estate transactions, litigation or personnel).

Unlike PUDs, municipal utilities must adopt "ordinances" in order to have formal policies established. The law requires that public hearings be held before ordinances can be adopted. You not only have the right to attend these hearings, but also to participate.

The policies of Seattle and Tacoma are two clear examples of different approaches to public participation. Seattle City Light is controlled by the City Council. The Tacoma Utility Board controls the Tacoma Department of Public Utilities.

Seattle City Light has numerous Citizen Advisory Committees on everything from rates to conservation to new power plants to service policies. Seattle has the most progressive rate design in the entire Northwest: It promotes conservation, discourages waste, and promotes equity between classes. Through a public-participation process called "Energy 1990," Seattle avoided participation in WPPSS nuclear plants 4 & 5. Seattle has actively promoted and financed energy conservation measures for many years.

Tacoma, on the other hand, has no citizen input in its energy planning. Its rate structures allow industrial customers large quantity discounts, fail to promote conservation and fail to charge fast-growing customer classes the cost of their expansion causes. Tacoma has been very late in getting started on conservation programs, and is the second largest utility participant in WPPSS 4 & 5.

Like Seattle City Light, many municipal utilities have established citizen advisory committees. Such committees are valuable tools, giving interested citizens access to the utility's professional staff, allowing different points of view to be aired and allowing different policy options to be developed.

oped. Through this process, citizens help define the issues in a given case before it is actually forwarded to the city council or utility board.

Such advisory committees, like PUD citizen advisory committees, must have access to professional staff of their own choosing, and must have authority to hire their own consultants at utility expense. Often the utility's own professional staff members have been involved in the business for so long that they find new ideas difficult to accept. If your utility has not established an advisory committee, you can ask it to do so in a way which encourages the broadest possible public participation.

Municipal utilities, as part of city government, have much wider powers than PUDs. The same city council which sets rates can also adopt building codes, restrict new service to energy-inefficient buildings or otherwise act in a comprehensive manner on energy policy.

COOPERATIVES/MUTUALS

Cooperatives and Mutual power companies are neither private utilities (regulated by the Washington Utilities and Transportation Commission), nor public agencies (subject to the state open public meetings laws). They are private corporations, governed by a board of directors elected by their customers, and subject to their own by-laws.

As a result, these utilities sometimes refuse to conduct business in public. If you belong to a co-op, your first priority should be to insure that all board meetings are open, and that all documents of the co-op are available to any member. In this way, you can find out what policies are being proposed before they are adopted and implemented.

Co-ops are subject to certain laws of the state of Washington, but not very many. For example, no utility can increase rates retroactively, because this violates both the contracts clause of the state Constitution, and the Uniform Commercial Code. Co-ops are allowed to offer low- or no-interest loans for energy conservation, and are required to file annual reports which include their plans for repayment of their WPPSS debt obligations.

Beyond that, however, co-ops are pretty much on their own. A co-op can hold all meetings in closed session, can deny its members access to internal documents under some circumstances, can raise rates without a hearing and can donate money to political causes, if the by-laws do not prohibit such activity. Co-ops are also free to establish citizen advisory committees, to provide their ratepayers with funding for consultants and lawyers and to provide customers with sufficient information and ample public hearings to facilitate aggressive public involvement. If you belong to a co-op, you can obtain a copy of the by-laws, and learn what changes need to be made to insure that all citizens can participate fully in the decisions of the co-op.

SUMMARY

Every consumer, no matter what type of utility supplies his or her power, can get involved in rate-setting decisions. Whether through an election campaign in a PUD, a rule-making request in a co-op, or a formal intervention in a private utility case before the WUTC, you can voice your concerns to your electric company and to the people who decide how your rates will be set. You can join with other utility customers to study the utility and its policies, and to work for sensible energy choices.

HOW YOUR RATES ARE SET

The appropriate regulatory body for your local utility sets your rates in a "fair," "nondiscriminatory," and "just, reasonable and sufficient" manner. The utility is allowed to charge rates sufficient to pay its legitimate costs, but not to charge you a different rate than other customers receiving a similar service.

Virtually all utilities hold some kind of hearing before rates are adopted. The utility staff or consultants usually present their recommendations for changes in rates, but consumers may urge that these recommendations be rejected in favor of more progressive options.

At most hearings, you, as a customer, are entitled to present your own testimony and the testimony of "expert" witnesses and to ask questions or cross-examine other participants in the rate hearings. Industrial customers often hire expensive lawyers and consultants to participate actively in these hearings, in order to have rate structure decisions made in their favor.

In the case of municipal, PUD or co-op utilities, industrial customers also lobby the people who will make the decisions outside of the formal hearing procedures. You may be confronted with industrial customers effectively arguing that you should pay more and they should pay less; a strong organization is the best way to defend your right to fair rates.

Often utilities will hire experts to compile a "cost of service" study to divide the utility's costs among its customers.



"It's certainly refreshing to meet someone with no energy policy."

Cost of service studies are not necessarily objective efforts. They are frequently biased one way or another, depending upon the methodology chosen.

A cost of service study should not be taken to be "gospel" on how rates should be divided among customer classes. Some cost of service methodologies tend to favor the interests of residential and small business customers, while other approaches favor large industrial customers. (See the technical appendix to this manual on cost of service issues.)

In order to be effective in any rate proceeding, you must be well organized, be able to communicate your positions to the public and to the regulators, and be ready to ask tough questions of groups with opposing viewpoints. (See the organizing checklist section of this manual.) Take the time to organize before you get started to boost your chances of success.

THE PUBLIC UTILITY REGULATORY POLICIES ACT

As a part of the National Energy Act in 1978, Congress required all large electric utilities to conduct certain studies and hold certain hearings on ratemaking concepts which could result in additional energy conservation, improve economic efficiency, and promote equity between customers.

PURPA, the Public Utility Regulatory Policies Act, provides an opportunity for ratepayers of large utilities to become formally involved in the ratemaking process. While the initial determinations required by PURPA have been made, the law provides that any ratepayer can intervene in any rate proceeding of an affected utility in order to discuss issues covered by PURPA. Each utility affected by PURPA has developed detailed rules for intervenors.

The Act applies only to large utilities. Those in Washington which are required to comply include the private utilities, and the cities of Seattle, Tacoma and Port Angeles. PUDs required to comply include Snohomish, Clark, Grays Harbor, Benton, Chelan, Grant and Cowlitz. If your utility is affected, they can provide you with a copy of the law; or, you can write the Electric Power Research Institute at Box 10412, Palo Alto, CA, and ask for a copy of the "PURPA Manual."

Once you have intervened, you are entitled to cross-examine anyone who offers testimony on subjects like cost of service; you are allowed to present your own direct and rebuttal testimony; and you are entitled to a copy of the transcript of the entire process at the cost of reproduction. This process insures that alternative ideas of how cost of service should be measured or how rates should be structured will be heard and considered. If you are served by one of the affected utilities, you should file a petition to intervene in any rate increase hearings which you want to influence.

Prior to 1981, all of the affected utilities were required to hold hearings to consider and determine if certain standards of ratemaking should be adopted. The standards can be summarized as follows:

- **COST OF SERVICE:** Rates for each class of service should track the cost of serving each class. Consideration of both marginal and embedded cost of service studies is required.
- **DECLINING BLOCK RATES:** The rate per kwh should not decline as usage increases, except where clear cost-related justification exists.
- **SEASONAL RATES:** Rates should vary by season where utility costs vary by season.
- **TIME OF DAY RATES:** Rates should vary by time of day where utility costs vary by time of day.
- **INTERRUPTIBLE RATES:** Customers should be offered interruptible rates if the cost of doing so is less than the cost to the utility of administering the rate.
- **LOAD MANAGEMENT:** Utilities should implement load management measures, such as radio control of water heaters, when the peak load savings justify the cost.

In addition, service standards were to be considered under PURPA, including such issues as termination of service policies, master metering, information to consumers

and advertising. Of these, termination is the most controversial and of greatest concern to low income ratepayers. (See section of this manual on termination policies.)

After holding hearings, each utility was required to make a determination if each standard was appropriate for the local utility. Most utilities adopted all of the standards, but many have failed to implement them.

Detailed discussions of each PURPA issue are contained in the "PURPA Papers," published by the Environmental Action Foundation, 724 Dupont Circle Building, Washington, DC 20036. These are valuable analyses of the issues which consumers should raise in the area of rate design.

The Cost Of Service Standard

The most important of these standards is the cost of service standard. Most utilities adopted this standard, but without specifying the method by which costs would be measured. As the section on Cost of Service Studies in this manual details, there are many different ways to measure cost of service. The Seattle City Council found the standard to be so vague that they rejected it.

The U.S. Department of Energy published a "Voluntary Guideline" under PURPA for solar and renewable energy. The guideline was intended as a reference for utilities concerned with promoting alternative energy sources, since this was one of the primary purposes of the National Energy Act, and therefore of PURPA. This guideline stressed that use of anything other than marginal cost of service studies was discriminatory. It was published in the Federal Register on Feb. 22, 1980. (See section of this manual on Marginal cost of service vs. Embedded cost of service.)

Lifeline Rates

Section 114 of PURPA required all affected utilities to consider the concept of lifeline rates, defined as a rate below cost for essential levels of service. This is somewhat different than a baseline rate, which may actually track costs closely, but still provide power for essential services at low cost, if limited low cost resources are available, as they are in the Northwest.

Most of the PUDs in Washington which held hearings on the lifeline concept rejected it as a "welfare program." This approach failed to recognize, as Seattle did in adopting the lifeline concept, that PURPA defines a lifeline rate to include all customers, not just low income or senior citizens.

The Washington Utilities and Transportation Commission adopted a baseline rate standard, rather than lifeline, simply to avoid the semantic confusion on the role of a lifeline rate. All of the private utilities in Washington now have inverted rates, which provide basic service at a rate lower than for additional power under the baseline concept. The Snohomish PUD adopted a "graduated rate" standard in their hearings, but have not yet implemented it. Seattle adopted the lifeline concept directly.

Lifeline and baseline rates are discussed in detail in a separate section of this manual. Under PURPA, however, ratepayers can ask utilities to consider the concept at any general rate hearing.

Compensation To Intervenors

One provision of PURPA provides that intervenor groups are entitled to be paid for the costs of intervening if their concepts are adopted. Compensation is to be provided for legal fees, expert witness costs, and other expenses. Seattle has compensated two groups (Fair Electric Rates Now, and POWER) for their participation in Seattle City

Light rate hearings.

Other utilities have refused to provide compensation, and are being challenged in court. The compensation provision of PURPA should not be depended on as a source of funding for legal intervention or expert witness costs. A responsible utility, however, will agree in advance to provide financial assistance to a well-organized group of consumers, in order to insure that their point of view is effectively presented.

A PUBLIC POWER RATE CAMPAIGN ORGANIZING CHECKLIST

Utility rate-setting is a complex technical and political process. Concerned consumers need a well planned strategy to protect the interests of residential ratepayers, particularly low income and senior citizens. The utility, its consultants and groups of industrial customers will be planning months in advance for the rate hike. You should be on the move early to enhance public awareness, to raise important issues and to develop the technical information and political pressure which will help you obtain fair treatment when rates are increased.

1) Organize yourselves. Get together as large a group of activists as possible, including local senior citizen groups, small businesses, community action program activists, labor unions and others concerned about electric rate increases. Establish committees to do preliminary work, including a research committee and a publicity committee.

2) Begin to monitor the rates process at your local PUD or Municipal utility. If yours is one of the larger utilities, you can consider intervening pursuant to the process provided by the Public Utility Regulatory Policy Act (See section on PURPA in this manual).

3) Have your research committee meet with the utility staff and/or consultants charged with the rate design analysis. Check to see if they are taking a progressive approach to designing rates, including these options:

- Is a lifeline or baseline residential rate design being proposed? (See section of this manual on baseline/lifeline rates.)
- Is a special rate for low income senior citizens being included? (See section of this manual on senior citizen rates.)
- Are rates within each class flat or inverted, or is the utility promoting energy use with declining block rates? (See section of this manual on commercial/industrial rate design.)
- Are they using a marginal cost of service method similar to that used in Oregon in assigning costs between classes? (See section of this manual on marginal versus embedded cost of service studies.)
- If a specific cost of service method is not being used, are all rates being increased by the same amount per kilowatt hour? (Residential rates should not be raised more than commercial and industrial rates.)
- Is the monthly service charge being increased above the actual cost of reading meters and sending bills? (See section of this manual on monthly service charges.)
- Are those customer classes which are growing rapidly paying the very high costs of new facilities which are built to serve them, or are all customers bearing the cost of growth? (See section of this manual on cost of service methodologies.)

4) As information becomes available, popularize it. The

research committee should make preliminary estimates of the size of the rate increase — in percent, in cents per kwh and in dollars per month — and prepare a short report for use by the publicity committee. The report should at least show the increase to residential customers and the percentage of power used and revenues paid by each class of customers. The research and publicity committees must work together to make complex data understandable to the average ratepayer.

5) Identify constituencies in the community who will join or support you in a rates campaign. The groups working together on the campaign should take a position on the upcoming rate design questions and adopt a program or platform. This should be concise and non-technical, and it should probably consist of only three to five points.

Platform development is a difficult step. Group members must simplify and share complex information before making a decision. The platform should probably be adopted at a public meeting (smoothly chaired, not too long) in which people participate actively to put forth an economically and politically acceptable program.

EXAMPLE OF A RATE CAMPAIGN PLATFORM

A) No increase to the monthly service charge. Basic service should be available to everyone at a cost no higher than the cost of meter reading and billing. All transmission and distribution costs should be included in the rates per kilowatt-hour.

B) Rates for low income seniors should be frozen at current levels.

C) Cost of all 5 WPPSS plants (if included in rates at all) should be assigned to large energy users only. A baseline rate for basic service should be lower than rates for additional service. Hydropower is available in limited quantities at low cost, and should be sold at a price reflecting hydro-power cost, without including the WPPSS costs.

D) Rates for large industrial customers should not be more than 10% lower than rates for small business and residential customers.

E) Adequate funding should be provided to a public Citizen Advisory Committee for research, lobbying, and legal fees.

This is just an idea of what can go into a rates campaign. Conditions and issues vary from utility to utility, and from case to case; each situation demands a particular platform. The information in this manual will help you to understand the complex technical issues behind each of these platform issues.

Good luck.

RESIDENTIAL RATE STRUCTURES

BASELINE/LIFELINE RATES

The single most effective measure which utilities can take to promote energy conservation, bring future energy costs under control, and promote equity for low income and senior citizen ratepayers is to restructure residential rates. Most people in the Northwest are served by utilities which have so-called "baseline" or "lifeline" rates. Those utilities which are lagging behind need prodding to reform their rates.

A baseline or lifeline rate is an inverted rate structure designed to reflect the costs of existing low cost resources and new high cost resources to consumers. These rates include a low monthly service charge, an initial amount of energy at a low rate, and provide additional amounts of power at higher cost.

A baseline rate is generally designed to provide each customer with a share of the low cost hydroelectric power the region has at rates which cover the actual costs of that power. Use above a certain level includes the costs of more expensive thermal projects. A lifeline rate is designed to provide each customer with an amount of power sufficient to meet essential residential needs at low cost, without any specific reference to the cost of power production.

In the Northwest one rate design can achieve both goals. If each customer is given an allocation of low cost hydro-power sufficient to meet their essential needs, both lifeline and baseline criteria are met.

It is important to note that some utilities see lifeline rates as a program for low income and elderly customers only. Many have implemented special discount programs for the low income elderly (See section of this manual on senior citizen rates). The federal Public Utility Regulatory Policy Act (PURPA) defines a lifeline rate as a "rate below the cost of service for the essential needs of residential customers." This indicates that lifeline rates are essentially the same as baseline rates, and are intended to benefit all residential customers.

Baseline/lifeline rates work to achieve the goals of the region's energy policy: to promote conservation and the development of renewable resources, to improve fishery productivity, and to assure the region of an adequate energy supply.

Conservation Incentives

In the past, many utilities had "declining block" rates, which charged a high rate for initial usage, but rates decreased with increased consumption. This accurately reflected the fact that construction of the basic electrical distribution system was expensive, but additional powerplants were very cheap, so long as dams could be built on the region's rivers. The concept worked to accurately charge all customers for the costs which their basic and incremental consumption placed on the system.

This same theory now logically leads to the establishment of baseline rates. The region has a limited amount of hydropower, which is currently costing about one half cent/kwh to produce. Additional power is coming from coal and nuclear plants, at four to forty times the cost of hydropower.

By giving each consumer a fixed allocation of cheap hydropower, and charging a price that accurately tracks new power costs for additional consumption, consumers can decide for themselves if it makes sense to use more power than the hydro system can produce. If alternatives are available at costs lower than new power costs to produce, consumers will make those choices themselves. Baseline rates make conservation make economic sense.

All of Washington's private electric utilities have baseline rates, under a ruling of the Washington Utilities and Transportation Commission. All of these utilities receive a portion of their power from low cost hydroelectric sources, and supplement this power from thermal powerplants, including part-ownership of the WPPSS nuclear projects. Washington Water Power's current rate proposal is a good example of the baseline concept:

Basic Service charge:	\$3.00/month
First 600 kwh	2.38 cents/kwh
Next 700 kwh	3.01 cents/kwh
Additional kwh	3.62 cents/kwh

Under this rate, consumers using electricity only for essential needs pay a low rate. Few substitutes are available for refrigerators, basic appliances and lighting, so relatively few conservation opportunities are available. As consumption increases, providing power for water and space heating, however, the rate increases. Since most of the readily available conservation measures are aimed at water and space heating, ratepayers using electricity for these purposes will have a stonger incentive to employ such conservation measures.

Electrically heated homes create a major part of the Northwest's winter peaking problem, which forces the installation of extra turbines on dams, the construction of oil-fired peaking plants, and the import of power from California at very high prices, during peak periods. The result of a baseline rate, placing a greater percentage of the cost of larger residential users, is to give particular encouragement to these customers to bring down their winter power use, including their peak power needs.

The potential savings in energy and peak demand under a baseline/lifeline rate structure would reduce the Northwest's need to build expensive power generating facilities, such as the WPPSS projects, as well as reduce peaking needs on the hydro system.

One major study of baseline rates found that conservation of 3% to 19% could be expected from restructuring of

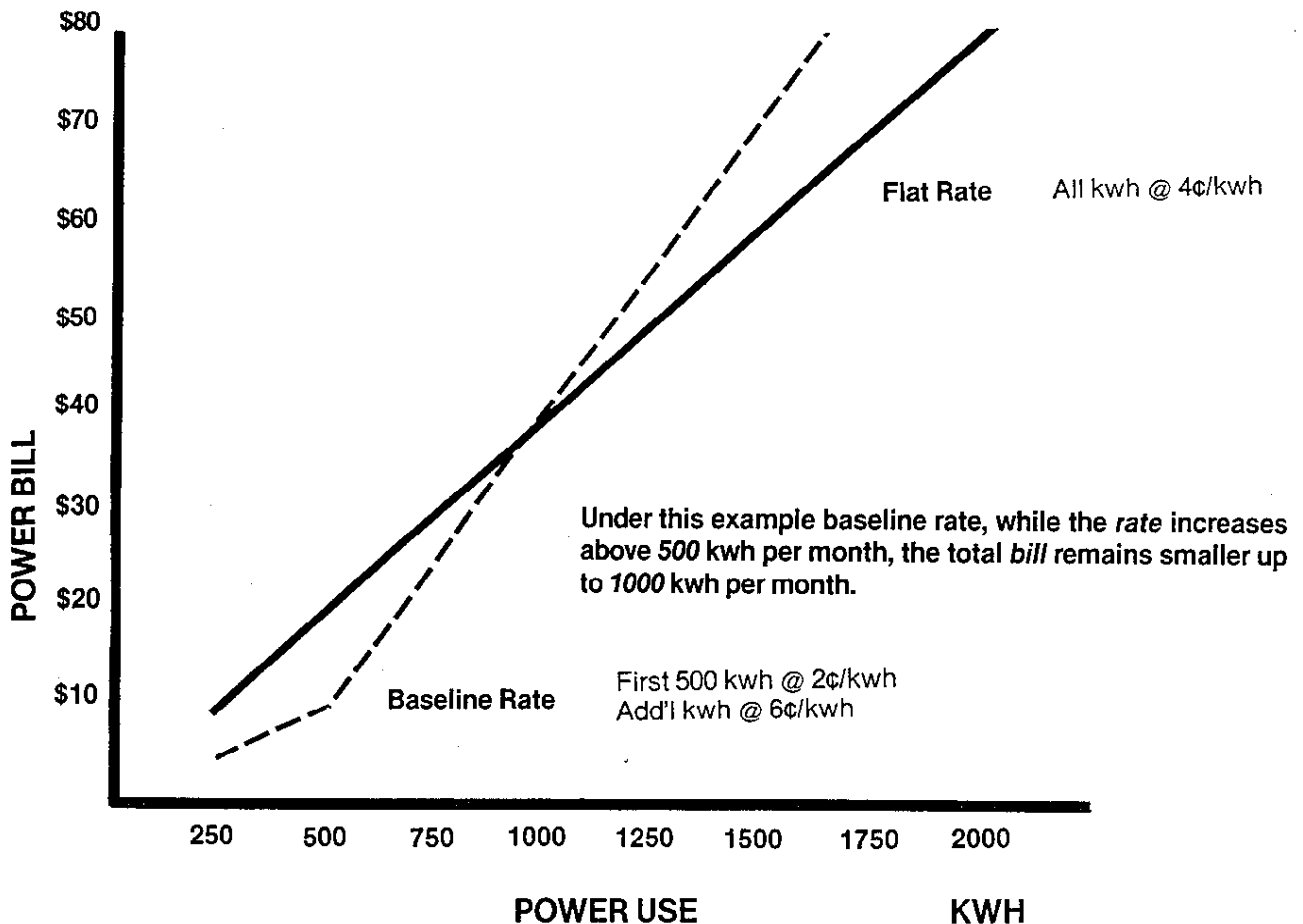
current PUD rates to follow the baseline model (See Residential Baseline Inverted Rates — Analysis of Their Application in Washington State, Senate Energy and Utilities Commission, Olympia, March, 1981.) If this amount of conservation could be achieved on all residential power use in the Northwest, the savings would exceed the output of an entire nuclear plant, reducing the need for rate increases; only rate restructuring would be needed.

One important thing to recognize is that the lower rate for initial consumption means that customers must go well beyond the breaking point in the rate before their bill is higher than it would have been if a flat rate had been used. The graph below demonstrates this issue:

Relation Of Baseline/Lifeline Rates To Cost Of Service Power Plants

Baseline rates are compatible with both marginal and embedded cost of service approaches. (See section of this manual on cost of service studies.) For example, the three Washington private utilities have established baseline rates under embedded cost of service methods, while those in Idaho and Seattle City Light have used marginal cost of service methods in reaching their baseline/lifeline rates.

The easiest way to recognize that baseline rates are consistent with cost of service principles is that a baseline rate prices both new and old power sources at their actual cost:



**ENERGY CONSERVERS SAVE MONEY
WITH BASELINE RATES**

each customer receives a fair share of low cost hydro resources at a hydro price, and can buy additional power if they are willing to pay the actual cost of producing that power from new facilities.

Two factors lead to baseline rates under embedded cost of service methods. First, large residential users tend to use most of their power during the winter heating season. As a result, the distribution system must be built to meet the large winter peak demand of electric heat customers, but they actually only use that peak capacity during the coldest weeks of the year. A baseline rate recognizes this by charging a higher price for the usage above average levels to help pay for the extra peak load facilities which must be built, but are only used a small percentage of the time. Second, baseline rates recognize that basic minimum needs can be met with low-cost hydropower, but customer usage above that level forces the utility system to seek out newer, more expensive power sources.

Under marginal cost of service approaches, economic theory suggests that all usage be priced at the level of new resources. Since this would produce more revenue than needed to pay for a mix of new and old facilities, the price for some of the utility's services must be reduced so that revenues and costs match. By reducing the rate for the monthly service charge, and for the initial, essential levels of service, few customers receive an incentive to serve the consumer more. Almost all customers use more than the basic level of service (600 kwh/month in the Washington Water Power example above) and economic efficiency is maintained.

Promoting Renewable Resources

Baseline rates encourage the development of renewable resources, including solar space and water heat, wind generators, and wood heat. Since customers receive their basic needs at low cost, but must pay higher rates for higher levels of usage, they have an incentive to install solar or wood heat, or wind generators, to meet their supplemental energy needs in order to avoid the higher rates associated with expensive new powerplants under a baseline rate. For this reason, solar energy organizations have been among the leading advocates of baseline rates.

Impact On Fish Runs

One of the purposes of passage of the Northwest Power Act was to invigorate the Northwest fishing industry by attempting to restore fish runs on the Columbia River.

Baseline rates assist in this process, by providing a stimulus to consumers to limit their use of electricity during the peak winter heating months. The higher prices of high usage give consumers an incentive to insulate their homes, install heat pumps and wood stoves, to turn down the heat in unused rooms, and otherwise hold down their power use. The reduced winter power needs reduces the need for using the Columbia River to meet peak power requirements, allowing higher river flows in the spring, when young salmon must migrate to the sea.

A baseline rate may be the least expensive means to provide for the needs of salmon migration, while at the same time protecting small electricity users from higher costs associated with new power plants. If other steps are not successful in meeting salmon migration needs, it may be necessary to build an entire coal-fired power plant just to free up the water they need in the river for spring migration. All ratepayers will be forced to pay the costs of the new gen-

erating plant, which quite possibly would not be necessary if baseline rates were adopted region wide.

Impact On The Elderly And The Poor

Every study comparing electricity use with income shows that the poor use a lower than average amount of electricity. As a result, rate structures which provide lower rates to smaller power users will generally help the poor. Senior citizens tend to live in smaller households than average, and therefore use somewhat less power than average households. As a result, seniors also will generally benefit from the implications of baseline rates. However, seniors do require warmer homes than younger people, and tend to spend more time at home. As a result, it may be necessary to provide specifically for the needs of the elderly in electric rates. While a baseline rate will help most seniors, implementation of special senior citizen rates may also be advisable. (See section of this manual on senior citizen rates.)

Implementation Of Baseline Rates

The easiest way to implement baseline rates is to hold the line on essential levels of usage when rates must be raised. Seattle raised their residential rates by 35% overall in 1980. However, the rate for usage up to 480 kwh/month was not increased at all; rates for usage above that level went up about 60%. The result is that consumers who held their power use to the essentials did not bear the rate hike, most of which was required to pay for new facilities.

For Northwest municipal, PUD, and co-op utilities, the same principle can apply. When rates are increased to pay for the costs of the WPPSS nuclear plants, increased transmission and distribution facilities, or other new projects, the rate for essential levels of use should remain unchanged. These minimum needs, which can be met from hydro generating plants, and distributed over existing lines, should not be forced to subsidize new projects.

In addition, Seattle eliminated their monthly service charge in 1980, which had been \$1.50 per month until that time. The theory was that the existence of the monthly charge did not discourage many people from hooking up to the system, but did place an unfair burden on small users, notably the elderly and the poor, whose small use of electricity made the monthly charge a major portion of their bills. Other Northwest utilities could follow this lead, allowing all residents equal access to the basic power system. (See section in this manual on monthly service charges.)

Summary

In the past, the availability of low cost hydropower from the Columbia River has led utilities to establish rates which encourage the use of energy. With new power plants being much more expensive than older facilities, rates should be structured to convey the cost of new facilities to consumers. A baseline rate allows consumers to choose for themselves whether to consume large amounts of power or not. If they choose not to use the expensive power, baseline rates eliminate the need for them to subsidize expensive new plants, which are built to meet the needs of those customers who continue to use large amounts of power.

Most of the people in the Northwest are served by utilities which recognize the conservation, efficiency, and equity which baseline/lifeline rates promote. Those utilities which have not reformed their rates are denying their customers access to a cost-free and very effective conservation program.

MONTHLY SERVICE CHARGES

Almost all residential customers pay a basic monthly service charge even if they use no electricity. Because electricity is an essential element of our lifestyle, needed for basic services like refrigeration, cooking and lighting, even a high monthly service charge will not persuade many customers to disconnect from the system. Economists say that consumers have little or no "price responsiveness" to monthly service charges, because a change in the charge doesn't cause a change in their behavior.

If, however, utilities reduce or eliminate these charges, they will need to increase the rates per kilowatt-hour of electricity in order to collect the same total amount of money. By restructuring charges in this manner, utilities can encourage conservation. A tiered rate structure, in which rates rise with increased consumption, promotes the incentive to conserve even more, because consumers will try to stay below the level of higher rates. (See section of this manual on baseline and lifeline rates.) A high monthly service charge doesn't encourage conservation, because it stays just as high no matter how much or little the consumer uses.

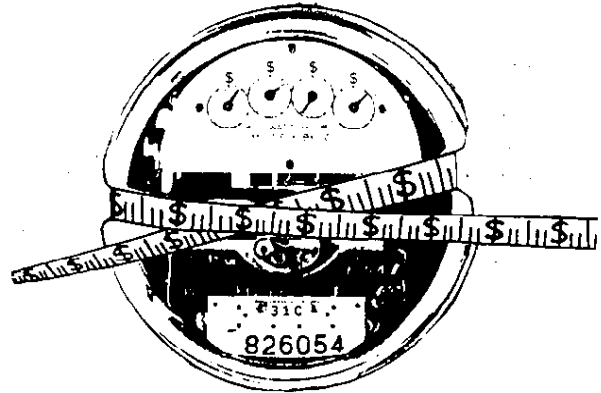
About half of the ratepayers in Washington are served by the three private utilities, Puget, Pacific, and Washington Water Power. The highest monthly service charge among these utilities is the \$3.60 charged by Puget. Another 15% are served by Seattle City Light and the Cowlitz County PUD, both of which have eliminated monthly service charges entirely. About two-thirds of Washington residents pay very small monthly basic service charges. In Oregon and Idaho, private utilities serve about 80% of the population. The Oregon private utilities have monthly service charges of about \$3.00; Idaho utilities have been eliminating their monthly service charges entirely over the past two years.

These and other progressive utilities are moving away from large basic service charges. In the past two years, Seattle City Light, which serves 500,000 people, and Idaho Power and Washington Water Power (in its Idaho service area) have completely eliminated their service charges. In the same time period, Puget Power and Washington Water Power (in Washington) have increased overall rates by about 45%, but have increased their monthly service charges by only 5%. These increases in rates per kilowatt-hour have mainly affected the blocks of service above the established 400-600 kwh baselines, to further promote conservation. (See section of this manual on baseline/lifeline rates.)

Many public utility districts, cooperatives and municipal utilities include the cost of building and maintaining their distribution systems in the basic service charge. This inclusion drives the charge much higher — as high as \$20 per month in one case. A high monthly service charge tends to drive up costs for small energy users, to discourage energy conservation, and to place heavy burdens on the elderly and the poor.

Numerous studies, conducted by utilities all over the country, suggest that most low income and elderly ratepayers use less power than other ratepayers. For these customers, the service charge is a larger fraction of the total bill than for other customers. A high monthly service charge

also shifts to small users a disproportionate share of utility costs. In the Mason County PUD system, for example, a monthly service charge of \$10.00 causes much larger bills



for small residential users. For customers who use only 400 kilowatt-hours per month at a rate of 2.5 cents/kwh, the service charge is 50% of the \$20.00 monthly bill.

A low service charge and an inverted rate would help the low income, low-use customer and would simultaneously promote conservation. For example, Puget Power's low service charge of \$3.60 would amount to only about 20% of the total bill for the same customer using 400 kilowatt-hours at 2.39 cents/kwh. Puget's low service charge and its three-tier inverted rate result in higher bills to customers using large amounts of energy; these customers have the most opportunity to conserve energy, and Puget's rates provide the incentive for them to do so.

Most people in Washington are served by utilities which have acted responsibly to minimize monthly service charges. Only the PUD's and co-ops, and a few municipal utilities, have failed to keep basic charges at a fair and appropriate level.

Monthly Service Charges – Major Washington Utilities

UTILITY	CHARGE	# OF CUSTOMERS
PUGET POWER	\$3.60	550,000
WA. WATER POWER	\$2.80	200,000
PACIFIC POWER	\$3.00	150,000
SEATTLE CITY LIGHT	NONE	250,000
SNOHOMISH PUD	\$5.25	150,000
CLARK PUD	\$5.90	78,000
TACOMA	\$3.25	104,000

Why Do Utilities Impose Large Basic Service Charges?

Utilities' high monthly service charges are based on their "customer costs," those costs which depend exactly on the number of customers the utility serves, such as the costs of preparing and mailing bills. Some utilities calculate customer costs to include "minimum distribution costs," the costs of constructing, installing and maintaining minimum size poles, wires and transformers. Many utilities argue that their large basic service charges are justified by high minimum distribution costs.

Minimum distribution system costs do not actually vary directly with the number of customers, and so they should not be included as customer costs. Minimum distribution equipment costs are more closely related to the density of a utility than to the number of customers (See the technical appendix on rate design for an explanation of low-density discounts), and the costs of maintaining the hypothetical minimum system are related to the weather.

A monthly service charge should not cover more than the basic services which vary directly with the number of customers served. Because the basic costs of meter reading, billing and accounting are directly proportional to the number of customers on a utility system, they are, in fact, customer costs, and should be included in the monthly service charge.

The practice of allocating minimum distribution costs on a per-customer basis has little basis in either theory or practice. When utilities were promoting electric use, they made an effort to keep rates per kilowatt-hour low. To do this, they assigned most costs on a per-customer basis in the monthly charge, so that less of their costs had to be included in power rates. Since utilities should now be promoting energy conservation rather than use, costs should no longer be allocated in a way that keeps electric rates artificially low.

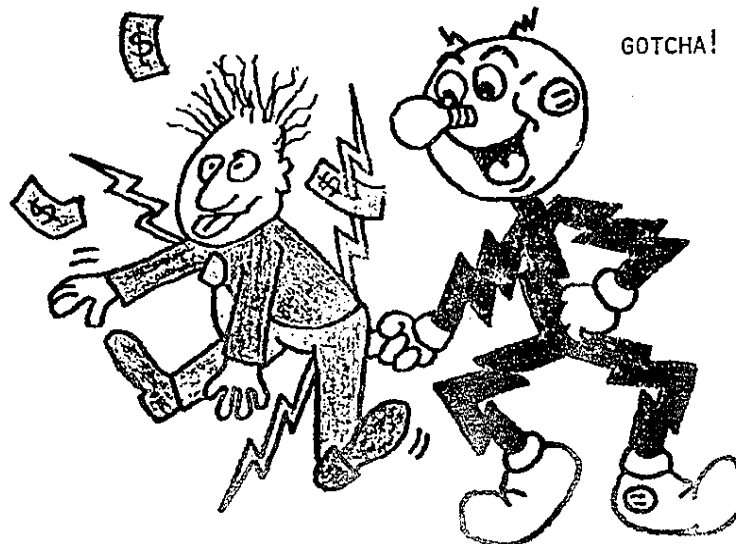
The cost of moving power to customers (that is, transmission and distribution costs) should be included as a part of

the cost of power, not assigned to "customer" costs without justification. Supermarkets include the cost of moving food to their store in prices; they don't charge admission at the door, which is basically what a high basic service charge does for electricity.

Utilities and their consultants sometimes argue that these charges represent the utility's cost of being "ready to serve." This concept ignores the fact that the cost of being ready to serve any individual customer is very small: only the cost of a wire from the power pole and a meter, plus meter reading and billing costs. The remainder of these costs, such as expenses for transmission lines and substations, are needed to serve all customers jointly — they do not diminish as the number of customers goes down, nor increase as additional customers come onto the system. By including the total distribution system costs in the "readiness to serve" category, the utility overcharges small power users, who should instead be billed for those costs based on the percentage of total power sales they consume.

Some utilities, instead of using monthly service charges, use the "minimum bill" approach. No monthly service charge is assessed apart for the per-kilowatt hour bill, but all customers are charged at least a set amount each month. Seattle charges at least \$1.50; the Cowlitz PUD at least charges \$3.75; Idaho Power charges at least \$6.00. Through these minimum bills, the utility receives enough money from its customers to cover its bookkeeping costs. For most customers, who use more than the amount of energy covered by the minimum bill, the effect is the same as a zero monthly service charge.

Overall, about 75% of the Northwest's population (Washington, Oregon and Idaho) have utility rates with monthly service charges below \$4.00 per month. Utilities charging more than that are discouraging conservation and imposing hardships on the elderly, the poor and other small residential power users. These utilities should follow the lead of major utilities throughout the region by lowering their service charges or instituting minimum monthly bills.



SENIOR CITIZEN RATES

Low income seniors, caught between fixed incomes and inflating energy prices, deserve relief from high energy prices. Washington State law (RCW 74.38.070; RCW 80.28.080) specifically allows public and private utilities to establish lower rates for senior or low income citizens. Several utilities have already implemented such rates; many others have considered and rejected senior citizen rates, and still other have totally ignored the problems that retired people face as energy costs soar.

Senior citizen rates are justified for two different sets of reasons. First, today's senior citizens built and paid for the hydroelectric system which provides most of our power at very low costs. They should not now be asked to help pay for new coal and nuclear plants which will only serve the needs of a growing population of younger people and newcomers to the Northwest.

Many retired people built and paid for their homes when they were working, so that they could enjoy the benefits of that investment after they stopped working. These seniors worked hard to earn the right not to pay higher and higher rents; they have also earned a right to the benefits of their 40-year investment in the Northwest hydropower system. As one utility employee put it, "I regard the hydro system as part of my grandparent's estate. When they are done using it, I'd like to inherit it...but not until they are done."

A senior citizen's electric rates, except for inflation in utility operating costs, could be frozen at their level when the citizen reached a particular age. Washington State property tax law (RCW 84.36) provides a limitation to the property taxes paid by low income seniors.

Utilities should consider more than simple cost of service in setting special rates for seniors, particularly those who use electric heat. A conscientious public utility should consider the ability of customers to pay; a utility that fails to account for this might cause undue hardship and hazards to human health.

Special rates for seniors also promote economic efficiency. All low income people, including low income senior citizens, have what economists call low "price elasticity" for electricity. This means that increases in their electric rates will not cause large decreases in their power use, and that decreases in rates will not significantly increase their power use. (See: Status of Residential Elasticity Studies, Pacific Gas and Electric, 1980.)

Low income people, particularly seniors, have low elasticity because they do not have the money to invest in energy-saving measures, such as storm windows or microwave ovens, to repair leaky water pipes, or to make long term commitments to home improvement projects. They cannot afford to reduce their energy consumption any further, no matter how high the price is. Other, wealthier ratepayers are more likely to have the money and the time to invest in conservation, and higher rates may encourage them to do so. Economists would say they have a higher elasticity. (See: New York State Insulation Survey, Cornell University, 1979.)

Because different groups of customers have different price elasticities, utilities can encourage energy conserva-



tion by reducing rates for low income senior citizens and increasing rates for other customers to make up the difference. The costs of power will be shifted to customers in higher income brackets who can respond to the price increases by conserving energy.

So far, utilities have considered special rates a "welfare program" to alleviate the difficulty many low income seniors are having with increasing energy costs. But special rates also make sense because they move high energy costs to customers who can respond to them by conserving.

Special rates should be structured to provide maximum relief to low income seniors, and to minimize the short and long run impact to other ratepayers. A uniform percentage discount basically gives seniors a lower rate for all the power they use. As a result, seniors have an increased incentive to consume power — even wastefully. Under this type of rate structure, seniors have no incentive to conserve energy, even if they are able to. The customer who uses the most energy receives the greatest discount.

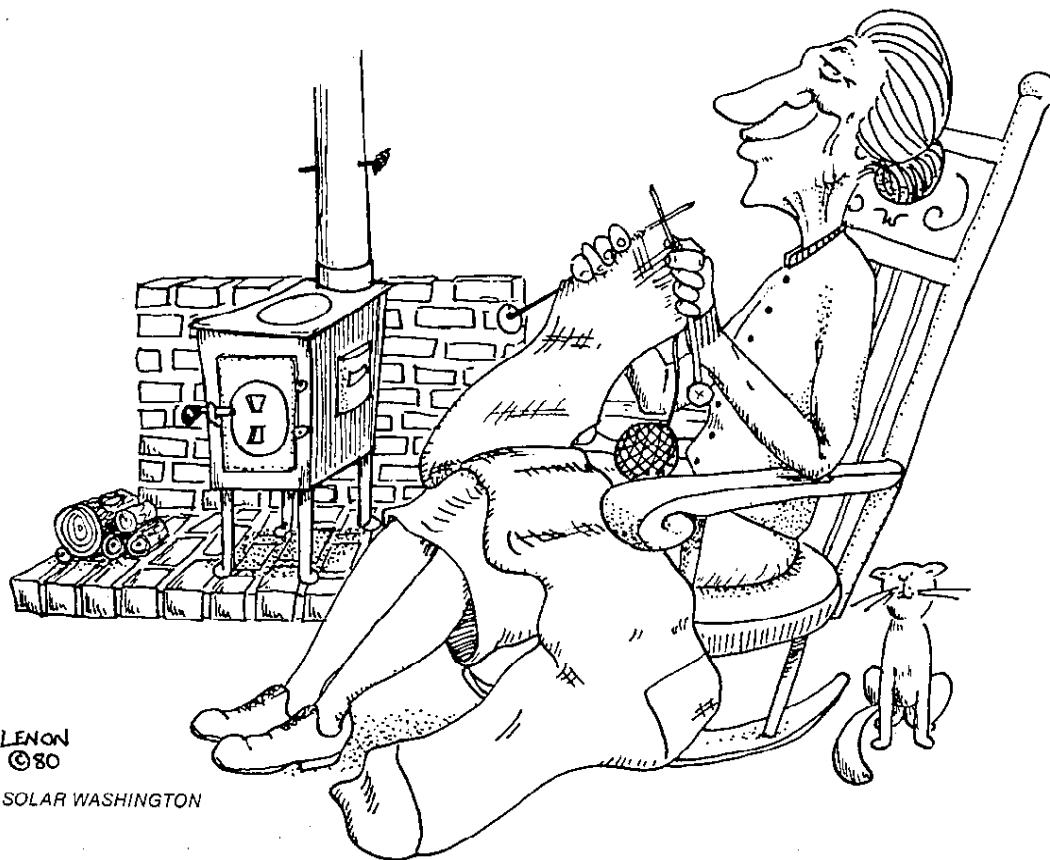
Utilities could instead offer a set dollar discount to low income seniors. This approach would benefit all eligible ratepayers equally, regardless of how much power they use. Those who conserve would not be penalized for their thriftiness by receiving a smaller discount on their monthly bill; those who waste energy would not be rewarded by receiving a larger dollar amount off of their high-use bill. Seniors

using oil, gas or wood for heat would not receive smaller discounts as a result, so the discount would not encourage them to convert to electric heat. Seniors would pay the same rates as all other ratepayers, but would still receive lower bills, because of their special discount.

A variation of this approach exempts low income seniors from the monthly service charges which many utilities bill to all of their customers. By exempting seniors from these charges, a utility effectively gives them a uniform dollar discount within the context of the current rate structure. (See section in this manual on monthly service charges.)

Summary

Utilities may use any of several devices to help low and fixed income seniors to meet the cost of electricity. Washington State law specifically provides for the special need of seniors. Utilities can and should design rates to allow seniors to enjoy the low cost of the hydroelectric projects in the region, which they built and financed and to exempt them from the costs of the coal and nuclear projects which are driving up rates.



TERMINATION OF SERVICE POLICIES

Your utility can disconnect your electric service for a whole variety of reasons ranging from nonpayment of bills to "willful waste of energy." However, you, the Washington ratepayer, have certain legal rights and protection against unfair shutoffs, and you can avoid costly, unnecessary disconnections by understanding these rights.

Public Utilities

Almost half of Washington's consumers buy power from public utilities (PUDs, municipals, and co-ops). If you buy power from a public utility, your utility gives you at least a month from when the bill is mailed to when it is due. Your utility must send you at least one reminder before issuing a disconnection notice.

You can dispute your bill at any time after you first receive it until at least two days after receiving a disconnection notice (some utilities give you a slightly longer grace period.) The utility may not shut off your power until your dispute is resolved. Your utility must grant you due process under the law, including an informal conference with a credit department employee and a formal hearing with a specially designated hearing officer.

If this still fails to resolve your dispute, you may be able to appeal your case to your utility's board of commissioners, depending on the utility (See the section of this manual on intervention).

If you have a dispute, be sure to contact your utility **BEFORE** your power is disconnected, or you may lose all rights to a dispute, and have to pay an expensive reconnection fee.

Private Utilities

If you buy electricity from a private utility such as Puget Power or Washington Water Power, your utility must obey the rules laid out by the Washington Utilities and Transportation Commission (UTC). The utility must allow a minimum of 15 days after issuing a bill before it comes due. After this time the bill becomes "delinquent" and your utility may decide to issue a disconnect notice. The utility must try to contact you by phone or in person to advise you of the pending disconnection. If the utility chooses phone contact, it must try to contact you at least twice, either at home or at your business number, if available. Also, the utility must provide written notice of disconnection sent by mail or in person. If the notice is hand-delivered, service may be terminated as early as 5:00 p.m. the next business day. If the notice is mailed, the utility must wait eight business days from the mailing date before shutting off your service.

All private utilities may require you to pay the bill in person after the disconnect notice has been mailed. However, if a service representative comes to shut off your electricity and you want to pay your bill, the service representative must accept payment. If you do not have the exact amount of the bill, the utility will credit your account with the balance, rather than giving you change on the spot. Your utility can charge you a fee for sending out the representative, though, so it's best not to wait that long. The fee is usually between \$8 and \$20 during normal business hours, and twice that at other times.

Your utility must allow you to dispute its actions, including granting you informal and formal hearings similar to those in PUD dispute procedures. You may appeal the utility's decision to the UTC (See the section of this manual on intervention). The utility must keep records of all complaints and dispute procedures, and it may not shut off your service during a dispute proceeding.

Methods Of Payment

In general, both public and private utilities must give you the opportunity to arrange a deferred payment plan if you cannot pay your entire bill on time. The details of such a plan will vary according to your credit rating. You can usually establish a good credit rating by paying all of your bills for at least one year.

In some areas, low income energy assistance programs may be able to help you pay your bills. If you think you might qualify for such a program, contact your utility or your local Community Action Program for more information.

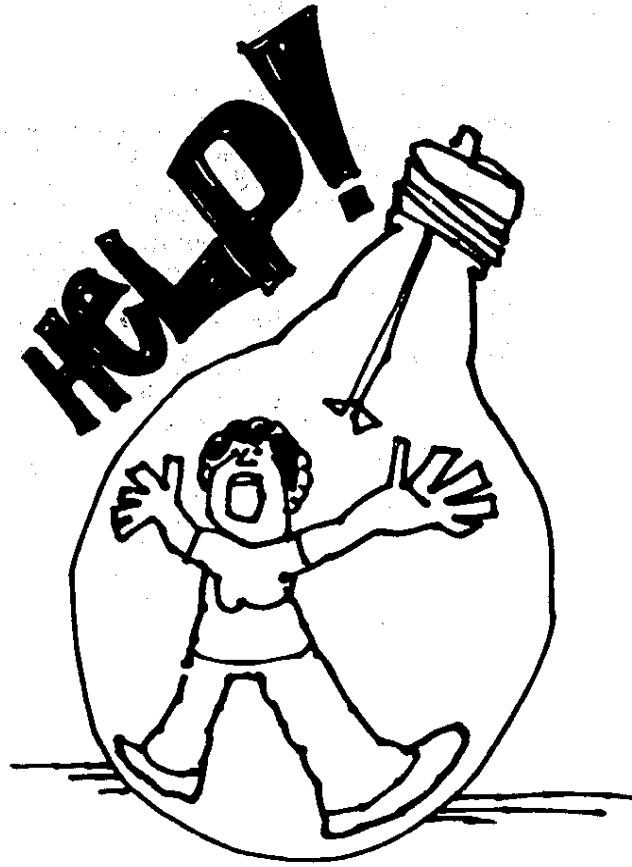
Special Considerations

Many utilities give special consideration to handicapped customers, senior citizens, customers with health problems and renters whose landlords pay the electricity bill. This is in accordance with the position of the federal Department of Energy, which believes that "the unique problems of elderly and handicapped customers should receive special consideration before electric and gas service is terminated."

The private utilities must obey UTC rules which require a utility to postpone termination of service for thirty days if the customer provides a certificate from a licensed physician stating that disconnection would aggravate an existing medical condition or create a medical emergency for any permanent resident of the household.

Renters also qualify for certain considerations under UTC rules. If you rent a house or apartment and your landlord fails to pay the bill, your utility must inform you of the impending disconnection, and give you the same amount of time to settle the bill that your landlord receives (eight days if mailed, one day if hand-delivered). If your landlord orders your service disconnected, the utility must inform you of the disconnection, and give you at least one day to remedy the situation. In either case, you can request a minimum of five days to make other arrangements for continued service.

If you buy power from a public utility, chances are that you get no such special considerations. Only Benton County, Douglas County and Snohomish County PUDs have special disconnection provisions for senior citizens or for medical emergencies. Seattle City Light also has similar special considerations. These four utilities also assist low-income customers by putting them in touch with the proper energy-assistance organizations. Seattle City Light and Snohomish PUD and a few other utilities provide special billing discounts for low-income seniors. Benton County and Douglas County PUDs and Seattle City Light specifically prohibit winter shut-offs in certain situations.



Improving The System

How can you, the ratepayer, improve existing disconnection practices? If you are a customer of a private utility, you can petition the UTC to revise its regulations. The federal government has created a set of voluntary model disconnection procedures, under the Public Utilities Regulatory Policies Act (PURPA) of 1978. You can urge your utility to adopt these procedures, which are available for you to study at your library. (See the references at the end of this section.)

If you buy power from a PUD, you have more opportunity to influence your utility's disconnection policy because you elect the PUD Commissioners. You can make unfair service policies an issue at the voting booth. Also, ratepayers may introduce and support rulemaking resolutions to improve service regulations at commission meetings, where the commissioners establish PUD policy. Similarly, electric co-op policy may be influenced through elections and Board resolutions.

Towns, counties, and other groups that franchise with a private utility for their power can attempt to include a set of service regulations in their new contracts when the old ones expire.

If your power comes from a municipal, you can probably affect policy through your city council or citizen's advisory councils. Many municipal utilities hold regular public hearings, where you can voice your opinions on service policies

and other utility issues.

References For Related Reading

1. **Rules of Practice and Procedure before the Washington Utilities and Transportation Commission.** (WAC 480-08 et seq.).
Outlines the specific procedures you must follow if you want to appear before the UTC.
2. **Rules Relating to Electric Companies.** (WAC 480-100 et seq.).
Explains the rights and regulations of privately owned utilities and their customers.
Both of the above are part of the Washington Administrative Code, available at many libraries. They are also available in pamphlet form from the UTC.
3. **Voluntary Guidelines for Termination of Service Procedures under PURPA.**
These are a set of model regulations developed by the Department of Energy after years of extensive public hearings. They are available from many libraries in the Federal Register, Vol. 44, No. 250, Friday, Dec. 28, 1979, under "Notices."
4. Your utility's specific policies on disconnection may vary slightly from those discussed here. They are available from the utility's credit department, usually at no cost. These should ALWAYS be consulted before taking action.

RATEMAKING

RATE BASE AND RATE OF RETURN: HOW UTILITIES EARN MONEY

Because private utilities have a special monopoly on electricity, their prices must be carefully regulated to insure that customers aren't forced to pay more than a fair price for power. Regulatory agencies determine how much money a utility needs to collect in a given year; this amount is called the revenue requirement and it is based on the company's expenses, the value of its rate base (equipment and facilities), and the fair interest, or rate of return, it should get on its investments.

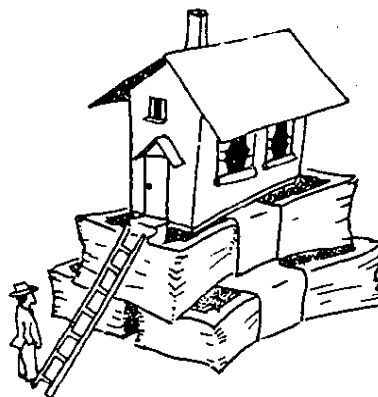
A utility's expenses include its operating costs (such as wages, repairs, insurance, fuel, and administration costs), taxes of all kinds, and depreciation — the gradual loss of value over the course of a plant's lifetime. The rate base is the total present value of the company's holdings — power plants, transmission lines, buildings and equipment. Part of the rate base is paid for by borrowing money from banks and bondholders (debt), and part by selling shares of the company to stockholders (equity).

The rate base and expenses are figured on the basis of a "test year," a recent twelve-month period in the company's history, by totalling the actual dollar values and then adjusting them to account for any unusual events during the test year or events expected in the coming year which would distort the average of the figures.

The rate of return is the profit the utility is allowed to make on its investment. It is calculated and expressed as a percentage of the rate base, and is intended to pay the cost of invested capital — in other words, it is the interest on the investment by stockholders, bondholders and banks in the utility. The cost of capital is the weighted average of the costs of debt and equity; it includes the interest on bonds and loans and the dividends on the company's stock, which must be high enough to attract new investors.

An imaginary utility regulator would assess the utility's cost of capital in the following way in order to set a fair rate of return:

	Capital Structure (% of total)	Cost Rate (interest rate)	Weighted Cost (Capital Structure Cost Rate)
Debt	50.5	9.61	4.85
Preferred Stock	13.0	9.91	1.29
Common Stock	36.5	15.25	5.57
Total:	100.0		11.71% Rate of Return



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To determine the cost rate of debt, the regulator would simply average the interest rates on long and short term bonds and loans. The cost of preferred and common stock, however, would involve a more complex calculation based on a projection of future market conditions. This calculation is a highly subjective and controversial aspect of rate-setting, and it has a serious impact on rates.

Setting the proper level for the rate of return is critical to the revenue requirement, or total dollars the utility will collect. The difference between allowing a utility a rate of return of 11.4% or 11.8% can mean a difference of millions of ratepayers' dollars. But there is no completely objective method for determining the right rate of return for a given utility. Depending on the attitudes and judgments of the regulators who decide what is a fair rate of return, power rates may stuff the pockets of a utility's investors or may drive the utility toward bankruptcy. A fair rate of return is the lowest percentage possible which will keep investors interested in and attracted to the utility.

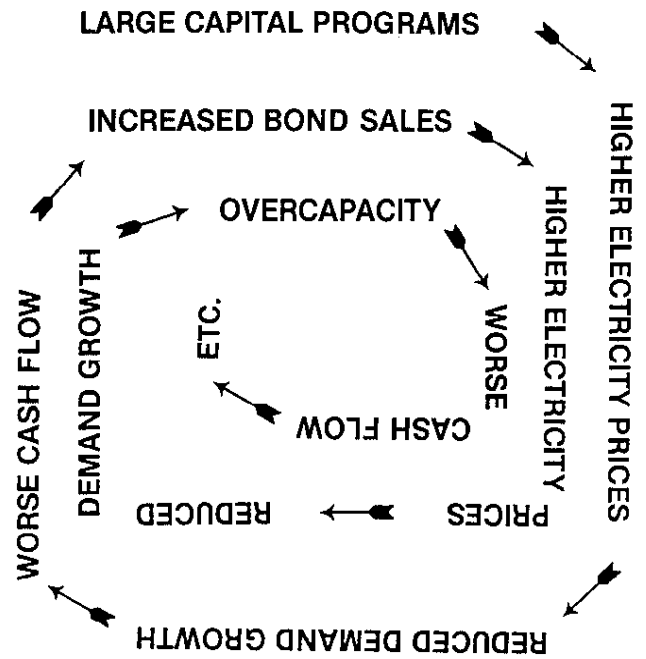
The total revenue requirement is equal to the sum of the utility's expenses and its cost of borrowing money and compensating investors. [REVENUE REQUIREMENT = (RATE BASE × RATE OF RETURN) + OPERATING EXPENSES.] This calculation is important to fair rate-setting, but it is not the only critical calculation. Regulators must also determine who will pay how much of the revenue requirement. Through the process of "rate design," the regulating agency allocates the costs of providing service among the "customer classes" (e.g. commercial, industrial and residential), the various groups of power users. (See section of this manual on rate-setting, and the technical appendices on cost of service issues and rate design.)

The Expanding Rate Base

Present rate-setting techniques offer many incentives for utilities to expand their rate bases by building new power plants, for example. Because the dollar return is greater for a larger rate base, utilities stand to benefit from expansion. In addition, various tax loopholes encourage companies to continually add new facilities. (See section of this manual on phantom taxes.) Rate structures which average the cost of new, expensive facilities (such as coal plants) with older, less costly ones (such as hydro plants) force all ratepayers to pay for expansion even if they do not need or use more and more power. (For a description of rates that encourage conservation and charge the costs of new plants to consumers who really use them, see section of this manual on baseline/lifeline rates.)

Because of the incentives, utilities inevitably make unnecessary investments in too many plants. To maintain financial health and to continue attracting investors during the lengthy construction periods on large power plants, utilities must raise their rates. But higher electricity prices often cause consumption to level off. By the time the new plant is completed, the level of demand may be so low that the utility cannot sell enough power to cover its fixed operating expenses.

The actual revenue collected is less than the revenue requirement, so the utility cannot pay its bond- and stockholders as much as they are entitled to, and thus the utility must file for another rate increase to pay the investors. Additional rate increases further dampen the growth of demand and cause further revenue shortfalls. With every shortfall, the company's credit rating deteriorates, so that every time it borrows money again the cost of borrowing is higher. This causes still higher rates, still slower demand growth, still more revenue shortfalls. This "spiral of impossibility" not only causes overbuilding and skyrocketing electric rates but also leads to financial instability for utilities.



SPIRAL OF IMPOSSIBILITY



'The charge? Indecent rate hike request!'

Bob Englehart, Fort Wayne Journal Gazette

CONSTRUCTION WORK IN PROGRESS IN UTILITY RATE BASE: A REVIEW OF THE DEBATE

In order to support their expensive coal and nuclear construction programs, Washington's private utilities are constantly exploring new ways to obtain increasing amounts of money from their ratepayers. To supply more money, the utilities have developed a new accounting treatment for construction projects.

Under this treatment, today's rates include the total cost of all construction projects (Construction Work In Progress, or CWIP, charges) so that ratepayers pay today for plants which will operate in the future. This new treatment which increases utility rates dramatically is an issue of major concern and controversy to the Washington Utilities and Transportation Commission (UTC) and to regulatory authorities across the nation.

In the past five years, customers of Puget Power, Washington Water Power, and Pacific Power and Light have paid over \$30 million in CWIP charges. These funds have paid for construction work on the Colstrip, Montana coal plant and the Skagit, Pebble Springs, and WPPSS nuclear plants. Now we know that most of these plants will never be completed. Ratepayers, not private stockholders, have lost their investment.

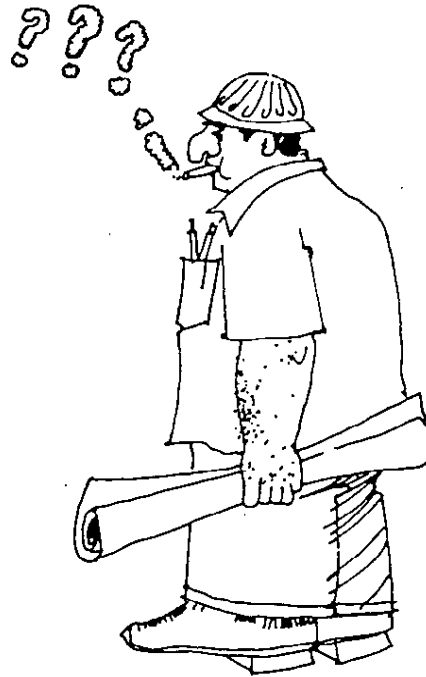
Historically, utilities have not been allowed to collect rates based on new plants until the plant was actually serving the ratepayers. Ratepayers could not be required to pay for plant and equipment until it was "used and useful." By including CWIP in the rate base, the UTC and other commissions have changed this long-established policy which prevented utilities from charging their customers for plants that are not yet producing or transmitting electricity.

What is the effect of including CWIP in rate base?

A regulatory commission uses a basic formula to determine the total dollars that a utility will be allowed to collect. First, it determines the "rate base." This includes the total capital investment in power plants and other utility facilities and equipment.

The rate base is the amount of investment on which the utility is allowed to earn a rate of return. The rate base is multiplied by the cost of capital for the utility, or the interest rate on its investment. This "rate of return" includes the cost of debt (bonds) and the cost of common and preferred stock. To this figure is added the operating expenses which include such items as administrative expenses, salaries, maintenance, etc. The result is the total dollars that the utility is allowed to collect each year from its customers, called the "revenue requirement." $(\text{RATE BASE} \times \text{RATE OF RETURN}) + \text{OPERATING EXPENSES} = \text{REVENUE REQUIREMENT}$.

CWIP is the investment to date in utility projects that are not completed. CWIP can range from small items that will be completed in very short periods of time, such as substations or transmission lines, to major undertakings such as



coal and nuclear power plants, which will not "come on line" or produce power for ten years or more. By including CWIP in the rate base, the regulatory agency allows the utility to earn a return on the construction costs now, rather than having to wait until the construction is completed and serving the public.

Including CWIP in the rate base substantially increases rates for present ratepayers. For instance, if a utility is allowed a rate of return of 15% and seeks to include thirty million dollars of construction costs into the rate base, this will result in a total revenue of $.15 \times \$30,000,000$, or \$4,500,000. However, since the utility collects the income taxes it would pay on its revenue in addition to the revenue requirement itself, the total impact on rates is approximately \$9,000,000 per year. Because of federal and state taxes, ratepayers must pay \$2.00 for every dollar raised to support CWIP. (See section of this manual on phantom taxes.)

How much does CWIP cost consumers?

Utilities argue that the inclusion of CWIP means although customers pay more today, they will pay less in the future when the plant comes on line because the total cost of the plant in the rate base will be less when the plant comes on line. This, of course, is because all of the interest on funds borrowed during construction has already been paid by the ratepayers, not by voluntary investors who receive a return on that investment. When the time value of money is considered, consumers actually pay more over the long run when CWIP is included in the rate base.

A dollar today is more valuable than a dollar in the future. There are two reasons for this: inflation and the return on an alternate investment of the dollar. Assuming that inflation will continue, even at a moderate rate, it is clear that today's dollars buy less than the dollars of five years ago and are worth more than dollars that will be spent five years from now. Aside from inflation, a dollar that a consumer does not have to pay today for CWIP can be invested to earn interest, but a dollar received in the future cannot. So an adjustment must be made in the future "savings" under CWIP to compensate for the cost of giving up real money now in exchange for the promise of that money later.

Every consumer has a personal discount rate for money, depending on how much he or she presently values money. The time value of money is higher for low income consumers because they can least afford to give up money from their present budgets, and for elderly customers because they may not live long enough to realize a return on a long-term investment. A low income person, faced with higher rates due to CWIP, might have to borrow money from a bank at 24% interest to pay his or her bills; CWIP is much more of a burden to this person than to a more wealthy consumer who simply gives up the 6% interest on the money he or she withdraws from a savings account to pay the bills. If a low income or elderly person has to give up other necessities (such as food or medical care) to pay for CWIP, the burden is even greater and that person's discount rate is even higher.

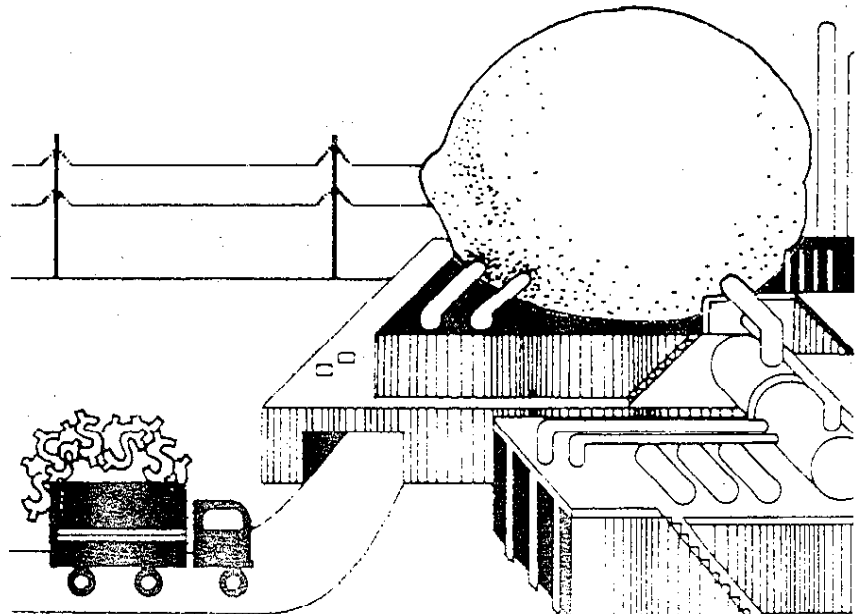
Including CWIP in rates forces present customers to bear the burden of the massive construction programs of the

Northwest's private utilities. To receive the full benefit of their forced CWIP investments, a utility's present customers must remain customers not only through the eight to twelve year construction period for any CWIP-financed plant, but also through the plant's 30-40 year useful life. Many senior citizens will not live to use power from the plants.

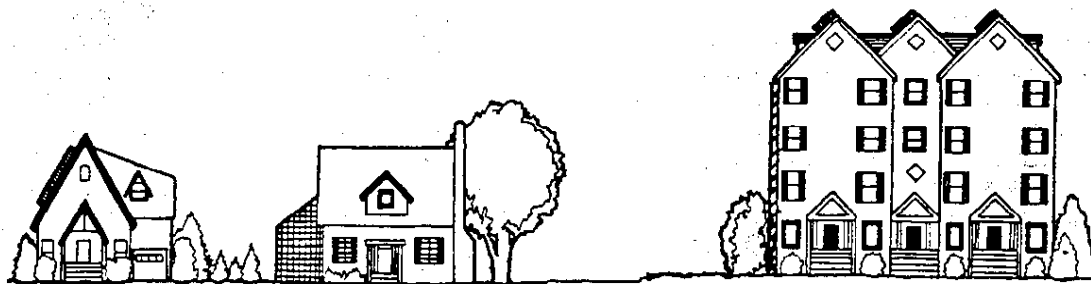
Some of the baseload coal and nuclear plants that are being constructed in the Northwest may in fact never come on line because of regulatory, financing and demand problems. Recently the Skagit/Hanford and Pebble Springs plants planned for Washington and Oregon, respectively have been informally terminated because they are not needed. Ratepayers have lost the millions of dollars they paid for these plants from the inclusion of CWIP costs in the rate base while the plants were still in the planning stages.

CWIP makes the power that half-built plants will someday produce more expensive to consumers. If CWIP is included in rate base, present customers will pay construction costs divided by the number of kilowatt-hours currently used. Since the new plants are needed to meet increasing future demand, their construction costs would be lower per kilowatt-hour if they were spread over the larger future power sales. Even for present customers who will enjoy the plants' eventual output, CWIP makes electricity much more expensive than necessary.

Utilities which include CWIP in rate base ask present customers to assume the risks of stockholders without any of the rewards of ownership. By requiring present customers to pay the interest costs now on plants that will not serve them until sometime in the distant future (if ever), the risk of the investment will be shifted to the ratepayer and away from the stockholder. If the plant never goes on line, the ratepayer will have already invested substantial amounts of money which will be lost. This should be the function of the shareholders or private investors who are compensated for the risk by the rate of return that they earn on this investment. Where CWIP is allowed, ratepayers are being forced to bear this risk with no corresponding chance of return.



ENVIRONMENTAL ACTION



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PHANTOM TAXES

Private utilities employ several complex accounting procedures which reduce their tax liability and boost the rates they charge their customers. "Phantom taxes," the result of tax breaks and accounting gimmicks, are a billion-dollar windfall profit to utility stockholders nationwide. Public utilities, whose customer-owners are the only "stockholders," cannot do this.

Like other profit-making businesses, investor-owned utilities must pay income taxes to the federal government. Regulatory agencies allow the companies to recover their income tax expenses in the rates charged to their customers. Since 1954, however, legislators have created a set of tax breaks which has reduced the utilities' tax burden, and in some cases has eliminated it entirely.

The tax breaks received by utilities are, for the most part, the same as those received by other businesses. However, because everyone must buy electricity from a utility, and because electrical generation is a large and capital-intensive industry, the social and economic repercussions of these loopholes are far more serious than for other businesses.

The type of accounting the utilities prefer is called "normalization," under which utilities may delay paying the government, but may charge customers as if they had in fact paid the taxes. Its alternative is known as "flow-through" accounting, a procedure in which customers are charged only for taxes actually paid by the utility to the government. Although many state commissions ordered their utilities to flow-through tax savings to customers in the 1950s, when many tax breaks were first instituted, federal legislation has progressively become more favorable to normalized accounting. Increased federal support to utilities culminated in the Economic Recovery Tax Act of 1981. This law not only increased the size of corporate tax breaks but effectively put all utilities on a normalized basis for one of the major tax breaks, accelerated depreciation. It also allows utility stockholders to defer paying personal income taxes on dividends if they are reinvested in the utility.

Accelerated Depreciation

Depreciation is one of the largest expenses a utility incurs. Although depreciation does not represent an actual cash outlay by the utility, it is considered a valid expense for

ratemaking and tax purposes. Instead of charging customers for the full cost of a new plant when it is first completed, a power company recovers the cost gradually over the lifetime of the facility. If, for example, a \$300 million plant is expected to last 30 years, the company could charge its customers \$10 million each year to cover the cost of depreciation. This method of recovery is known as "straight-line" depreciation.

Taxes are rarely paid on a straight-line basis, however. The passage of the Internal Revenue Code of 1954 allowed businesses to accelerate the rate of depreciation, by depreciating larger portions of an asset (such as a power plant) during the early years of its lifetime and smaller portions in later years. As a result, the utility can postpone tax payments to the federal government, even though ratepayers are paying the taxes to the utility on time.

Normalization allows the utility to reap the benefits of accelerated depreciation at the customers' expense. Utilities can charge ratepayers a higher rate based on straight-line depreciation even though the company is paying lower taxes based on accelerated depreciation. The company places the extra revenue in an "accumulated deferred income taxes" account, and invests it in new facilities until the tax is due to the government. It amounts to an interest-free loan from ratepayers.

Utilities argue that this arrangement saves consumers money by reducing the company's need to borrow money. Since utilities must pay interest to investors such as banks and bondholders, borrowing money increases their expenses and, therefore, the rates they charge their customers. Accumulated deferred income taxes are cheaper sources of money than bond sales, because they are essentially interest-free loans from the ratepayers to their utility. This savings should be reflected in the company's rates, but it may not be as large as the added expense of the deferred taxes.

Normalized accounting in a rapidly expanding industry does not merely defer taxes but eliminates them entirely. The amount of taxes paid by the utility never catches up to the amount owed to the government. Customers, therefore, are consistently overcharged for this "phantom" expense in their electric bills.

Investment Tax Credit

The investment tax credit allows a business to subtract 10% of the cost of any new investments from its taxes. Through this break, federal taxpayers subsidize one-tenth of the cost of any new construction. If a utility builds a \$300 million plant, this loophole allows the company to subtract \$30 million from its federal income tax.

The company receives the entire \$30 million credit for its large investment right away from the IRS; customers only receive the savings gradually over the lifetime of the new facility. If the plant is expected to last 30 years, customers receive only 1/30 of the credit in the first year. The company invests the other 29/30, and earns profits for its stockholders — another interest-free loan from ratepayers.

Another important benefit to utilities of federal tax laws is the "carry back/carry forward" provision, which allows any company showing a net loss for tax purposes to receive a refund of taxes paid in the past three years. A company may "save" its tax losses for up to fifteen years and subtract them from future tax liabilities. A utility can still charge its customers for federal income taxes even when it is receiving refunds in back taxes. Individual taxpayers cannot do this.

The ramifications of federal tax loopholes go beyond the overcharge to customers, windfall profits to company stockholders and loss in tax revenues. For instance, phantom taxes have a negative effect on employment because

they encourage capital-intensive investments rather than labor-intensive investments.

Second, because the tax system provides incentives for expansion, it encourages inefficient and unnecessary investments by industry. By inducing companies to undertake expensive projects even when cheaper alternatives are available, tax breaks cause a misallocation of economic and natural resources, and lead to higher and higher rates.

Citizens can protest the inclusion of phantom taxes in rates. Although the UTC cannot explicitly reduce a utility's fair rate of return, it can use different accounting techniques to link the rate level to actual tax expenses. The inequities resulting from federal tax laws can and should be used as evidence in rate hearings.

PHANTOM TAXES IN THE NORTHWEST

Utility	Actual Taxes Paid in 1978 to Federal Gov't	Taxes Included In Customer Rates in 1978	Benefit of Phantom Taxes
Puget Power and Light	\$1,933,817	\$20,869,875	\$18,936,058
Pacific Power and Light	1,364,262	12,594,000	11,229,738
Washington Water Power	6,340,258	9,621,973	3,281,715

1978 figures from the Environmental Action Foundation.



UTILITY FINANCING ISSUES

Utilities need money to build power plants, transmission lines and all the facilities for moving energy to consumers. Because they need such large amounts of capital (money to invest in productive equipment), they have mechanisms for obtaining it from such sources as stock and bond sales, short-term loans from banks and electric rate receipts.

With creativity and hard work, utilities can bring down the cost of obtaining capital and can reduce rates in the process. Private utilities often ignore the costs of the interest they must pay on borrowed money, because those costs are generally passed through directly to ratepayers. Ratepayers can urge their local utilities to reduce borrowing costs in order to keep rates as low as possible.

Stock Sales

Private utilities obtain about one third of their capital by selling additional shares of "common stock." Common stock represents a portion of the company's capital assets, including facilities, cash and money owed to the company. Each share issued is equal to every other share. As the company grows and issues additional stock, each share represents a smaller percentage of a larger company.

Stock prices are based in part on the "book value per share" of the company. This figure represents the company's assets divided by the number of shares of stock it has issued. Utilities prefer to keep the value of their stock growing to encourage investors to purchase more shares. To do this, some utilities include facilities in their accounted assets which are not yet complete, and which may never actually be used to produce electricity.

This accounting mechanism artificially increases the book value of the stock, so that new stock is sold at a higher rate than existing stock. Otherwise, new stock would be sold at a price lower than the book value of stock sold in the past. The stock already issued would be reduced in value, or "diluted" by the sale of additional stock at a lower stock, because all shares of common stock are of equal value. Utilities say this would be unfair to existing stockholders.

The selling price of stock is also determined by conditions in the open market. Ratepayers should urge that utilities sell stock only when the market is "up" — that is, when buyers are willing to pay a high price. Utilities often argue that, in order to attract buyers, their rates should cover the cost of paying high dividends to their stockholders. These high dividends, however, may not be backed up by the utility's productivity and profit, but only by the ratepayers' pocketbooks. If the utility were making sensible investment decisions, the company's thrift would appear naturally in higher profits and higher dividends. Ratepayers should not have to subsidize the utility's attempt to appear more profitable than it actually is.

Long Term Bond Sales

Both public and private utilities sell bonds on the open market to obtain most of their capital. Institutions, such as banks, insurance companies and pension funds purchase most utility bonds. Wealthy individuals purchase some bonds, primarily public power bonds which provide tax-free income.

The timing of bond sales has an enormous impact on ratepayers. If interest rates are low throughout the market, the utility can sell bonds with low yields (low interest paid by the utility to the bondholders), and ratepayers will not have to pay much higher rates as a result of the sale. But if interest rates are high, and the utility sells bonds anyway, the cost of the bond sale will be reflected in much higher rates.

When faced with high interest rates, most businesses in a competitive market postpone large projects requiring large amounts of capital. But utilities, which operate in a special, regulated market, often continue to finance large projects regardless of interest rates. Because utility regulators allow utilities to pass on high interest costs to their ratepayers, utilities can afford to sell bonds even in an unfavorable market. If utilities had to behave like ordinary businesses, they would postpone construction projects in progress until interest rates went down.

By failing to postpone construction of the last WPPSS nuclear plants promptly in 1980, when interest rates first reached record levels, utilities have cost ratepayers a great deal of money. Utilities sold hundreds of millions of dollars of additional bonds, to be repaid by ratepayers at very high interest rates. The region is now facing a power surplus, due to the recession caused in part by high interest rates and rising electric bills.

Ratepayers should demand that utilities defer construction programs when interest rates are high, to protect ratepayers from the high costs of bond sales during such periods. By organizing and working together, ratepayers can shape a more sensible electrical energy future.

Cooperative Finance Corporation

The nation's rural electric cooperative utilities have joined together to form an organization called the "Cooperative Finance Corporation," or "CFC." Through CFC, the co-ops, which are mostly very small utilities, can obtain long-term financing at competitive rates.

Usually, co-ops are able to get some of their capital at low interest rates through the Rural Electric Administration, a federal agency established to assist in making electricity available in remote areas of the country. Since only a portion of the co-ops' financing comes from REA, CFC was set up to provide the remainder.

CFC is a co-op bank, much like the banks farmers, grocery store owners and other groups have formed in the past. CFC can help small utilities finance local improvement projects at lower cost than either bank borrowing, or small, administratively expensive bond sales.

Very few cooperative utilities have pursued CFC financing for conservation programs. If the Bonneville Power Administration refuses to provide adequate support for conservation programs under the Northwest Regional Power Act, ratepayers of cooperative utilities can urge their utilities to obtain CFC funding for local conservation and renewable resource efforts. At the same time, they should keep in mind all of the recommendations above about timing of borrowing, and deferral of construction programs when interest rates are high.



"IT'S A GUARANTEED INVESTMENT, GENTLEMEN...THE DUMMY HERE PAYS YOU BACK!"

Short-Term Borrowings

Utilities routinely borrow funds for short periods of time, as well as for large, long-term projects. Short-term bonds bear higher interest rates than long-term bonds, but are still cost-effective in some cases. Because long-term bond sales are expensive to conduct, utilities only use them when they need to borrow large amounts of money. Otherwise, utilities borrow over the short term and pay off the short-term debt when they sell long-term bonds.

If long-term interest rates are high, responsible utilities will avoid selling bonds, and may use short-term borrowing sources to support their construction needs until bond interest rates come down. Short-term borrowing can reduce overall costs for major projects by preventing the need for long-term bonds until the projects are finished and their viability is demonstrated. Investors may be willing to accept a lower interest rate on a plant which is proven to produce power.

Private utilities issue "commercial paper" and borrow from banks when they need money on a short term basis. Commercial paper is a short-term "IOU" sold to firms and investment funds which have cash to invest for periods of a year or less. Public utilities also borrow from banks, and recently have been allowed to issue short-term municipal paper, sometimes known as "bond anticipation notes," or "BANS."

Bank borrowing is generally much more expensive than issuing bonds on the competitive market. Some utilities pay the extra interest to foster a good relationship with the bank; the extra costs can be easily passed through to ratepayers. Although utilities may argue for the importance of a good relationship with banks, these higher interest rates often exceed a reasonable level. Typically, banks charge about 2-3% more than commercial paper rates. If a utility can save money by issuing commercial or municipal paper, ratepayers should urge it to do so.

An Innovative Approach – Green Mountain Power Company

Green Mountain Power of Vermont has taken an innovative approach to short-term borrowing: It borrows capital from Vermont residents. The company sells "energy thrift certificates" in amounts of \$500 and more. The certificates bear interest and have terms of 360 days.

Because residents receive higher rates of interest from the "energy thrift certificates" than from putting their money in the bank, the notes are an attractive investment. The utility pays less interest than what a bank would charge, and therefore the program saves the utility and its ratepayers money.

Ratepayers can organize to help their utilities become more financially stable. By combining innovative financing arrangements, like Green Mountain Power's program, with existing funding sources, like the Cooperative Financing Corporation, ratepayers and utilities can begin to bring the cost of capital down. Ratepayers can also pressure regulatory agencies to direct utilities toward more financially sound practices, by refusing to allow the companies to pass through the costs of overpriced bond sales. Utilities and their customers can work together to create an efficient energy economy.

The table below shows the annual payment that would be required to pay off a 30-year, \$100 million bond issue, at various interest rates:

INTEREST RATE	ANNUAL PAYMENT (\$ MILLIONS)	TOTAL DEBT SERVICE (30 YEARS) (\$ MILLIONS)
6%	7.26	218
8%	8.88	266
10%	10.61	318
12%	12.41	372
14%	14.28	428
16%	16.19	486
18%	18.13	544

COSTS OF THE WASHINGTON PUBLIC POWER SUPPLY SYSTEM NUCLEAR POWER PLANTS

Projects 1, 2, And 3

Nearly every electric utility in the Northwest owns part of one or more of the WPPSS nuclear plants. And almost all of the utilities in the region buy much of their power from the Bonneville Power Administration (BPA). The Washington Public Power Supply System (WPPSS), a group of Northwest Public Power utilities which have combined their financial resources with BPA to build five major nuclear projects, holds BPA, the utilities, and ratepayers in a spiral of increasing rates.

BPA has agreed to purchase the power produced by the first three WPPSS plants. The agency will sell the nuclear power along with power generated at its dams at a price which reflects the average cost of both kinds of power. This special wholesale rate is offered to utility customers of BPA, who in turn sell it to their residential, industrial and commercial customers. We, the consumers, pay for the WPPSS plants in our retail electric bills — bills which get higher every year as BPA raises its wholesale rates to cover the costs and cost-overruns of these enormous projects.

The costs of the first three WPPSS plants, including the mothballed Plant #1, are the largest single cause of residential rate increases in the Northwest. One hundred percent of the costs and power from the first two, and 70% of #3 go directly to BPA. (The other 30% of Plant #3, like all of Plants #4 and #5, belongs to the utility participants in WPPSS). BPA has raised its wholesale rates by 200% in the last three years to cover the costs of these three plants; an additional increase of 60-70% is expected October 1, 1982, also primarily to cover these costs. This will cause about a 30% retail rate hike.

The BPA wholesale rate, which will be about 2 cents/kwh on October 1, 1982, pays for the federal hydroelectric system, the BPA transmission grid and the first three WPPSS nuclear plants. For each dollar BPA receives from public utilities for power, about 50 cents will go to pay for the first three WPPSS plants, even though none of them are generating power.

Plant #2 is expected to be on line in early 1984; #3 is scheduled for completion in late 1986; Plant #1 has been indefinitely deferred, but was otherwise expected to be on line in 1986. None of the three will be producing energy when BPA's proposed October 1982 rate hike is in effect — from October, 1982 to October 1983.

Public utilities, including municipal utilities, co-ops and PUDs, purchase most or all of their power from BPA. The private utilities, under the Northwest Regional Power Act, only purchase power for their residential ratepayers from BPA.

Every ratepayer in the region is paying for WPPSS through BPA. Most ratepayers are served by WPPSS participants, and they pay even more for the partly completed plants. But you can urge your utility to take steps to charge you more fairly for these huge investments.

Used and Useful?

Utility regulatory tradition stipulates that rates should include only cost for facilities which are "used and useful." Since the WPPSS plants are neither used nor useful, you can ask your utility to absorb or defer these costs until the projects actually provide power. Each utility could issue local utility bonds to finance the costs of these plants until the plants become operational. Investors rather than today's ratepayers would then pay for plants that are not providing service.

The WPPSS utility participants considered an idea like this in 1979. At that time, WPPSS attempted to obtain approval of a "subordinated financing agreement," under which the Supply System would have issued bonds to pay the interest on bonds already issued for construction in progress, until the plants were actually operational. Only two of the 102 participating utilities, Inland Power and Light and the Pend Oreille County PUD, rejected this agreement. For lack of unanimity, it failed. Since all other public utilities (including yours, if you are served by a Municipal, PUD or co-op) in the region approved the plan, you might argue that they should implement the same concept at the local level.

WPPSS 4 & 5 Costs

WPPSS Plants #4 and #5 are not part of BPA's system. They are owned entirely by the members of WPPSS. On January 22, 1982, the WPPSS Board of Directors voted to terminate nuclear Plants 4&5. At that time, some \$2.25 billion in bonds had been issued for these projects, and WPPSS owed to contractors about \$350 million more than the amount of cash that WPPSS had on hand. WPPSS has asked Northwest utilities and their ratepayers to pay for these projects which will apparently never produce any electricity.

For some utilities, paying for WPPSS 4 and 5 could cause serious damage to the local economy, making local businesses uncompetitive, home electric bills unmanageable and irritated agriculture unprofitable. Several utilities are pursuing legal challenges to WPPSS' demands on this basis. In most areas, the costs will amount to a surcharge of about one half cent per kilowatt-hour, an increase which will

endanger seniors living on fixed incomes, and the poor. The costs will force changes in lifestyles even for families earning an average income.

WPPSS COSTS AND SENIOR CITIZENS

Low income elderly citizens should be totally exempt from any WPPSS costs, particularly costs of WPPSS 4 and 5, which are passed through to ratepayers. The WPPSS 4&5 plants were not expected to be in service until 1987, under the construction schedule in effect when the plants were halted. At that time, the plan was to defer any payments from the utilities until the plants were on line.

With termination, payments are scheduled to begin in 1983. Even under the old schedule, many seniors would never have lived to see the plants operate, nor would they have paid the costs. The early termination of the plants should not now force these seniors to make payments for power they would not have used even if the plants had been completed. (See section on Senior Citizen Rates in this manual.)

How Can WPPSS 4&5 Costs Be Paid?

ILLUSTRATION: The table below estimates the surcharge which would be required to pay the costs of WPPSS 4&5, if each utility levied a uniform surcharge on each kilowatt hour sold:

Utility	Surcharge	Utility	Surcharge
Tacoma	.5 cents	Inland Power	1.1 cents
Snohomish PUD	.5 cents	Grays Harbor PUD	.5 cents
Clark PUD	.75 cents	Benton PUD	.8 cents
Cowlitz PUD	.5 cents	City of Richland	.8 cents
Lewis PUD	.6 cents	Clallam PUD	.7 cents
Franklin PUD	1.1 cents		

If the courts determine that the WPPSS 4&5 contracts are valid and binding, ratepayers should be prepared to attempt to "turn a lemon into a lemonade." Consumers can demand that utilities cover the costs of WPPSS 4&5 in a progressive manner which will do the least to disrupt lifestyles, while doing the most to promote energy conservation. A progressive approach to the WPPSS costs will hold down rates over the long run.

WPPSS 4&5 costs can be imposed on customers through a uniform surcharge on all power sales except the essential "baseline" quantities of electricity. Such a surcharge would be consistent with general ratemaking goals of conservation, efficiency, and equity (See section on baseline/lifeline rates in this manual). It would recover the costs from the large power users whose growing demand originally led energy planners to believe we needed the WPPSS plants. It

would promote energy conservation and the efficient use of existing resources, and would keep long-run power costs low. And it would recover revenues to make payments for the WPPSS bonds.

A uniform surcharge on a per kwh basis would also force large industrial customers, who presently pay much lower rates than residential and commercial customers, to pay a share of the WPPSS 4&5 costs proportional to their power use. Any other approach will probably place an unfair burden on residential customers.

If utilities choose not to use this type of surcharge, they may end up charging their customers unfairly for WPPSS. For example, utilities could impose a uniform monthly surcharge to each customer of \$10 to \$20 per month to pay for WPPSS 4&5. This would place the largest burden on those customers using small amounts of power, would shift the burden to residential customers and away from industrial customers, and would utterly fail to promote conservation. (See section of this manual on Monthly Service Charges.)

A second unfair alternative would be to allocate these costs either as "demand" charges, or to base the surcharge on a uniform percentage of the bill. Although these options would be more fair than a fixed monthly surcharge, they would force residential and small business customers (who pay high rates already) to pick up the lion's share of the WPPSS 4&5 costs as well. (See the section in this manual on Demand Charges.)

Most utilities which have voluntarily agreed to help WPPSS pay its interim termination costs have charged customers on per-kilowatt-hour basis. For example, the Clark County PUD has instituted a surcharge of four-tenths of a cent per kwh. This works out to about \$5 per month for the average residential customer (more for large users, less for small users). If such an approach included an exemption for essential needs, it would be the most fair way to recover the WPPSS costs.

Summary

The costs of the WPPSS nuclear plants are forcing electric rates to skyrocket. If ratepayers must pay these costs, rates should be structured so that large power users, whose use created the perceived need for the plants, will pay the bulk of the costs. Some unfair approaches to recovering these costs would place heavy burdens on small power users, including residential customers who are aggressively conserving energy. Consumers can encourage their utilities to place the costs of WPPSS fairly and squarely on the consumers whose energy use encouraged utilities to invest in the plants in the first place.



"FELLAS, DOES THIS MEAN THEY'RE FINALLY ON TO US?!"

COST OF SERVICE STUDIES

Your rates are based partly on the cost of getting power from the generating plants to your home. An industrial customer pays a different rate, because the cost of serving a factory is not the same as that of serving a house. A factory, for example, needs only expensive heavy-duty transmission lines; a house also uses less expensive distribution lines and requires more service from the utility's accountants and repair crews per kilowatt hour used.

When energy planners decide how to set rates for a utility's customers, they often develop information on the different costs of providing power to different classes of customers. This information, summarized in a highly technical report, is called a cost of service study. The cost of service study analyzes all of a utility's costs, from the interest on bonds to the gasoline in repair trucks to the paper used in company offices. The study assigns these costs to each customer class based on the particular way that class uses energy. Rates for the customer classes depend on the cost of serving their particular needs.

Cost of service consultants often argue that their studies provide all of the information needed to set rates. But many electric rate-making decisions are inherently political in nature, and cannot be based entirely on mathematical analysis, in spite of what the consultants may argue.

If your local utility concludes (based on a cost of service study) that residential customers must pay a higher rate than commercial or industrial customers, you should not assume that the study and the decision are somehow infallible, or even that they are logical and reasonable. Industrial customers routinely hire special consultants who do their own cost of service studies based on methods which are tilted towards their employers' own goals. A decision based on an industrial consultant's study is not likely to be fair to residential ratepayers.

To help insure that rates are set fairly, ratepayers can ask that the regulators of their utility make crucial policy decisions about cost of service studies in a public hearing forum. These decisions should include consideration of whether or not to accept cost of service as a basis for rates. In 1980, during hearings on the Public Utilities Regulatory Policies Act, the Seattle City Council refused to commit itself to rates based on cost of service, because the notion of cost of service itself was too unclear.

Once rate-setters have decided to base rates on the cost of service, they must carefully decide which study method-

ology to use. The way a cost of service study is developed has a critical impact on ratepayers. Rate-setters should consider, in an open public forum, the impact of all available methods on different customer classes. (See this manual's Technical Appendix for information on cost of service methodologies.) The technical jargon used in cost of service studies often obscures the political importance of the information they contain. Ratepayers can advise energy policy-makers of the need to choose an equitable way to allocate costs.

Ratesetting Is A Two- Step Process

Two basic issues must be settled in order to establish rates for electric customers. First, rate-setters must determine "rate spread," which is the division of costs between the various classes of customers. Rate spread can be and often is based on cost of service studies.

Second, rate-setters must choose a "rate design," the actual rate structure through which the utility will collect its revenues, class by class. The cost of service study's findings indicate how much revenue the utility will need from each class of customers, but not how to structure rates to collect that revenue.

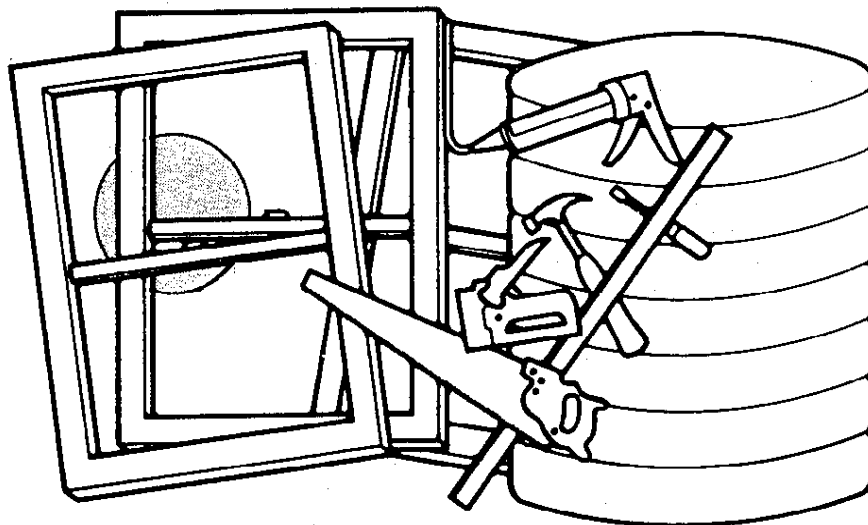
There is no one "right" way to establish rate structures. Rates can be structured to promote or discourage conservation, to benefit low income people or ignore their needs, and to help or damage the development of job-creating businesses in local communities.

What Does And Doesn't A Cost Of Service Study Do?

Although a cost of service study is a useful tool, it can't do everything. A cost of service study cannot make any of the important policy decisions about how to treat certain costs which do not clearly fall into any of the established cost of service categories. A cost of service study cannot conclude that any particular rate or rate structure is appropriate for any particular customer.

Cost of service studies are as complex and technical as they are important to fair energy policy. Concerned ratepayers can take the time to study the economic and mathematical details of these studies, and can use their knowledge to influence utility rate-making decisions. (For more information on cost of service issues, see the Technical Appendix to this manual.)

CONSERVATION AND RESOURCE DEVELOPMENT



ELECTRICITY DEMAND FORECASTING

Electric utilities in the Northwest have a habit of crying wolf about energy shortages. In the past decade, the demand forecasts our power companies have produced have greatly overestimated the region's future power needs. As a result, utilities have invested billions of dollars in expensive projects, such as the WPPSS 4&5, Skagit, and Pebble Springs nuclear plants. Utilities use forecasts as the basis for decisions to participate in new power plants and to build new transmission and distribution facilities, and these decisions, in turn, make a big difference in the future cost of power.

Who puts these forecasts together?

Three regional energy organizations presently produce the four major Northwest power forecasts. The Pacific Northwest Utilities Conference Committee (PNUCC), an association of aluminum companies and public and private utilities, does two of these; the "Black Book" and the "Blue Book." The Bonneville Power Administration and the Northwest Power Planning Council both develop forecasts independently of the individual utilities.

Washington State University also completed a regional power forecast this year, as part of a study of the need for WPPSS 4&5. In addition, the Northwest Conservation Act Coalition (NCAC), an association of business, labor, consumer, and environmental organizations, has developed a

"Model Plan" for the region's electrical future. The Plan includes an estimate of total future power requirements.

How do the present forecasts differ?

Each utility in the Northwest prepares a forecast of its own power needs. These are submitted to the PNUCC, and are added together to make up the "Black Book" forecast. The high power demand forecasts which led to the decision to start WPPSS 4&5 were the "Black Book" forecasts, to which each local utility contributed.

The "Black Book" is simply an addition of the individual estimates of each utility. Over 100 different utilities in the Northwest use vastly different methodologies. Some utilities forecast "with a ruler," simply assuming that past growth rates will continue forever. Others use complex computer models. All are concerned that the local utility have enough power to meet its needs. Unfortunately, often several different counties will be competing for the same new industrial plant, and all of the utilities will include the power needs for that plant and its employees in their own forecasts. The result is a very high regional power need estimate, when all of this double-counting is summed together by PNUCC.

The PNUCC Econometric forecast, or "Blue Book," is a complex computer model which incorporates estimates of future electricity, gas, and oil prices, future estimates of

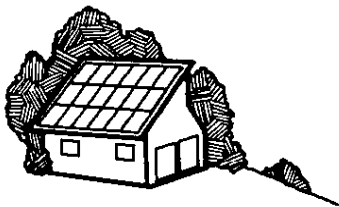
population and income growth, and estimates of insulation levels in future housing stock. It has typically been quite a bit lower than the "Black Book" forecast.

NCAC's Model Plan forecast is based on a technique called end-use analysis. This approach looks at the number of present and future energy users and the amount of energy each will use. The forecast determines how much energy the total region would need to serve all these energy users, assuming that all cost-effective conservation measures are implemented. The end-use approach allows forecasters to include conservation and solar energy savings.

The forecasts being prepared by the Northwest Power Planning Council and by BPA, and the one produced by Washington State University this year, all use a complicated mixture of econometric and end-use forecasting techniques. These are the most technically advanced forecasts in the region.

What should local utilities include in their forecasts?

Local utilities should assume that future buildings will be better insulated than current ones, that existing buildings will be tightened up with insulation, storm windows and other conservation measures, and that future houses will be smaller, on average, than existing ones, as family size de-



clines and housing costs increase. By recognizing these factors, utilities can serve additional homes without increasing the size of transmission facilities or distribution substations.

Utilities should also assume that industrial customers will improve their own energy efficiency, and will shift to alternative resources. Modern industrial processes are much more efficient than in the past. In the last ten years, the amount of energy used per unit of industrial output has dropped by about 20%. Utilities can expect further reductions in response to continuing increases in energy prices.

Local utilities should refer to the Washington Office of Financial Management's county-by-county population forecasts, to avoid overestimating the number of people they will serve in the future. In 1981, unlike past years, more people moved out of Washington than came here from other states. Utilities should not assume that their own service area will grow more quickly than the state average.

Utilities should avoid double-counting potential customers when preparing forecasts. Often, more than one utility will plan to supply energy to a new industry, even though the plant will actually be located in only one service area. Your utility may be double-counting some customers. As a result, it may build new energy facilities which will never be needed, and your electric rates will increase to pay these unnecessary costs.

Forecasts must recognize the effect that increased rates will have on electricity use. In the past, utilities have often assumed that people will continue using power at past levels even when rates are increased, although experience shows that people cut back their power use when faced with higher prices.

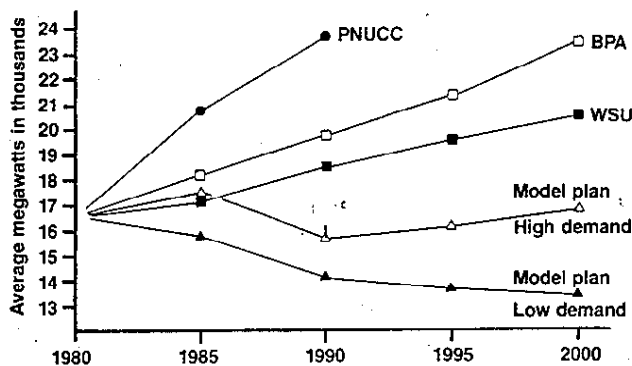
Local forecasts should specifically identify the conservation measures which local utility customers will implement. All utilities should provide insulation financing to their customers, and the power saved should be identified in the forecast. (See section of this manual on conservation loan programs.)

By participating in the forecasting process of your local utility, you can help hold down future power costs, develop an understanding of how much power will be needed in the future, and better influence utility policies on conservation, renewable resource development, and power plant construction.

Year	Forecasting Organization	Predicted 20 Year Growth Rate
1975	Pacific Northwest Utilities Conference Committee	4.9%
1975	Washington State University	1.5-2.4%
1977	Natural Resources Defense Council	.5%
1978	Northwest Energy Policy Project	2.9%
1981	Pacific Northwest Utilities Conference Committee	2.9%
1982	Washington State University	1.5%
1982	Bonneville Power Administration	1.7%
1982	Northwest Conservation Act Coalition	-.5%

The wide variation between forecasts reflects many factors — some judgmental, and some mathematical — and illustrates the uncertainty which has long been associated with power forecasting. This uncertainty demonstrates the need for more responsible local utility forecasting.

Comparison of regional electricity demand forecasts



WHY UTILITIES SHOULD INVEST IN ENERGY CONSERVATION

Most utilities don't understand that using energy more efficiently is just as good as making more energy. As a result, all of the existing and most of the proposed utility conservation programs fail to achieve energy conservation's enormous potential. If the Northwest fails to use this potential, billions of ratepayer dollars will be wasted.

Why should utilities invest in conservation?

Utilities should invest in conservation primarily because it is the lowest-cost source of additional energy. The cheapest energy we can get is the energy we waste. A kilowatt-hour saved by insulating an attic is no different than a kilowatt-hour produced at a nuclear plant — except that it usually costs much less. If utilities can free up wasted energy to meet the growing needs of their additional customers at lower cost than they can produce it from new powerplants, they should do so. Consumers facing unmanageable electric bills need conservation assistance to bring their energy costs down.

How much money should a utility be willing to pay for conservation?

Utilities typically respond to this question by setting the maximum amount to be paid out for conservation at the difference between **average cost** (the price of electricity to a utility customer or to a utility) and **marginal cost** (the cost of power from the last plant the utility is thinking of building). In this article, the difference between these costs is called the **differential cost**.

Since the average cost of power to Washington ratepayers is currently two to four cents a kilowatt hour, and the marginal cost of nuclear or coal plants is ten to fifteen cents a kilowatt hour and rising fast, the differential cost is six to thirteen cents a kilowatt hour. Six to thirteen cents is enough to cover most any conservation measure.

Utility planners expect consumers to pay part of the cost of conservation, so utilities are unwilling to pay more than the differential cost of power for conservation. But often utilities are not even willing to pay the full avoided cost for conservation. For example, Puget Power, which is considered one of the leaders in conservation (see table elsewhere for comparisons of utility programs), says its differential cost is about 3 cents per kilowatt hour. Puget got that figure by subtracting its current rates (about 3 cents per kilowatt hour) from the cost of two coal plants currently under construction in Colstrip, Montana (expected cost — about 6 cents per kilowatt hour in 1982 dollars). Yet Puget ratepayers are also being charged for Puget's 5% share of WPPSS 3 (expected cost — about 15 cents per kilowatt hour in 1982 dollars), and Puget wants to invest in coal plants currently being planned near Creston, Washington and two nuclear plants at Hanford, Washington that will probably cost even more. The true differential cost is quite a bit higher than Puget's figures.

Unlike money for conservation, the money for large thermal generating plants must be committed several years before the energy is actually produced. Puget should be try-

ing to avoid purchasing the most expensive resources first (WPPSS 3, Creston, and Hanford) and should base its conservation program on their costs. The result would be a differential cost in the range of 9 to 17 cents per kilowatt hour, ensuring full development of our conservation resources. Instead, Puget is willing to spend only about a fifth as much for energy conservation as they are willing to spend for new energy generation. And most utilities do not even have programs as good as Puget's presently inadequate effort.

Why are utilities reluctant to invest in conservation incentives?

BPA and various utilities explain their reluctance to invest in conservation incentives (for example, solar loan programs) in various ways. These electricity sellers argue that, since customers must pay for electricity they don't conserve, they should be willing to spend up to the cost of that electricity to implement conservation instead. They claim that other customers should not have to spend more than the differential cost to assure that the conservation is implemented. This claim is based on the expected response of a "rational" consumer (either a utility, in BPA's case, or a ratepayer, in a utility's case) to energy prices. This argument is technically sound, but there are a number of reasons why utilities and ratepayers do not always act "rationally."

Some "rational" utilities have a large financial and emotional stake in seeing thermal plants come on line, even if these plants are not cost effective. These utilities' interests may differ sharply from the interests of the people of the Pacific Northwest, who would prefer the cheapest, most reliable source to serve their demand.

The aluminum industry, another "rational" consumer bases its energy conservation plans on artificially low power rates included in their highly advantageous power sales contracts with BPA. Commercial and industrial customers are allowed to write off their energy costs on taxes. These financial arrangements make "rational" customers unwilling to spend as much money on conservation as strict concepts of economic efficiency would suggest. As a result utilities must get involved, to ensure that energy needs are met at the lowest possible cost to society as a whole.

Residential customers can't act exactly like the theoretical "rational consumer," either. About half of the homes in Washington are occupied by renters, seniors, and low income owners. These customers are generally unable to participate in a loan or partial grant program that requires the customer to put cash up front, or requires a mortgage lien. A disproportionately large percentage of those customers live in electrically heated, poorly weatherized homes. A conservation program that does not actively seek to include these customers will miss a substantial portion of our regional conservation resource.

Even if a customer does have money to put up front, most residential and many commercial and industrial customers don't have the information they need to make a "rational" ir-

vestment decision on energy conservation programs. Most people are reluctant to invest in anything that takes longer than three to five years to pay for itself, while utilities think in terms of thirty to fifty years. Because utilities have a long term perspective, they are uniquely suited for moving the region toward conservation over both the near term and the distant future. Any decision by utilities about the proper level for conservation incentives must take these pressures on "rational" behavior into account.

Why do all ratepayers benefit from conservation?

Utilities often set the amount they are willing to pay for conservation at or below differential cost due to a so-called "no losers" policy. This protects customers who do not implement conservation measures from paying higher rates than they would have paid if a centralized power plant had been built instead. The utility's reasoning is that by conserving energy instead of producing it, it receives less revenue, since it is investing money in something it can't sell. While the same number of homes are being heated and lighted, fewer kilowatt hours are being sold. Customers who have installed conservation are paying less money to the utility. This forces the utility to charge higher rates. Utilities claim this is unfair to non-participants, because it's more expensive.

Sound reasonable? It's not. Conservation is still the cheaper option overall. It appears more expensive to a non-participating customer because the utility is using a rate structure based on the average cost of all the utility's resources combined, instead of a more realistic, sharply inverted rate structure that reflects the actual cost of power from new resources. These new resources may cost up to 30-50 times as much as power from existing hydroelectric dams. (See section of this manual on baseline/lifeline rates.)

Since utility conservation programs typically pay for a combination of very cheap measures, like attic insulation, and some more expensive programs, like triple-glazed storm windows, the concern about non-participants can be addressed very easily. Utilities should be willing to finance any measure which costs less than power from a new powerplant, so long as the average cost of all measures implemented does not exceed the differential cost. In this manner, storm windows, which save energy at a cost of 4 cents per kilowatt hour, can be averaged in with attic insulation, which saves energy at a cost of 1 cent per kilowatt hour, and both can be installed at a cost of 2.5 cents per kilowatt-hour.

Since both measures are less expensive than a new power plant, which produces power at a cost of about 10 cents per kilowatt hour, the society benefits. Since the average cost of the measures (2.5 cents per kilowatt hour) does not exceed the differential cost of the utility's power resources (3 cents per kilowatt hour), non-participating ratepayers benefit, too. Puget Power, for instance, is now using this approach.

This cost-averaging proposal is not unique. A utility calculates the cost of power from a new coal or nuclear plant by averaging relatively inexpensive items like coal or uranium fuel with the high cost of specialized equipment needed to run the plant, such as stack scrubbers which keep the air clean around a coal plant or core cooling systems which prevent nuclear meltdowns.

By averaging costs in evaluating conservation programs'

cost-effectiveness, we can simply treat conservation costs the same way that utilities treat generation costs. Utilities that are worried about the "lost revenue" effect of conservation should consider the "lost revenue" effect of a long-term drop in energy demand as customers find themselves unwilling or unable to pay for electricity that is far more expensive than other energy options.

How should costs and benefits of conservation be spread between ratepayers and utilities?

Utilities may argue that the red tape of making and keeping track of several thousand loans of assorted shapes and sizes is more trouble than it's worth. A simpler approach may be a full grant program for any measure costing up to the marginal cost. Since the cost of many conservation measures is only a fraction of the cost of new thermal generation, the overall cost of an aggressive push for conservation is still much cheaper than the thermal alternative. Conservation is the best deal, even if utilities just go door to door giving full grants for any conservation or renewable energy resources costing less than the marginal cost of power. Such a program would also be easy to apply on either a utility or local government level. It would not be as expensive to ratepayers as the purchase of a new power plant.

Utilities appear to have few qualms about taking money from customers to build big power plants to make electricity. They seem to have a hard time, however, with the concept of taking money from customers to give to other customers to save electricity, **even if all customers save money whether or not they participate in the program.**

Even if utilities are not yet ready to treat conservation like any other energy resource, they should be ready to implement some compromise programs. Utilities should be willing to give full grants up to the point where the average cost for any available conservation resource does not exceed the full differential cost of power for any available conservation resource. This approach is undeniably cost-effective, and would simplify implementation, reduce cost, and stimulate participation in conservation programs.

Under the Northwest Power Act, BPA will finance numerous conservation programs. These programs are set up so that all Northwest ratepayers pay the costs of the programs. Any utility which does not participate in the program is forced to subsidize those which do participate. The ratepayers of the participating utilities receive lower bills, while those which do not participate get higher bills. Obviously, every utility should make full use of the BPA programs.

The BPA programs, however, suffer from the shortfalls identified in this article. BPA must be persuaded to make a commitment to conservation equal to its commitment to coal and nuclear plants, in order to minimize energy costs for Northwest ratepayers. For utilities which go beyond the basic BPA programs, the Northwest Power Act provides that "billing credits" be granted to transfer to the utility investing in conservation the benefits which those conservation programs bring to the region. (See section of this manual on billing credits.)

The billing credit program is just getting off the ground. Local utilities should be urged to support the efforts of the Northwest Conservation Act Coalition and other conservation advocates to make sure that this program is implemented to properly reward aggressive conservation programs.

WHY TO INVEST IN CONSERVATION EVEN THOUGH THERE IS A SURPLUS

For the past ten years, utilities in the Northwest have made dire predictions that the region would suffer devastating power shortages by the mid-1980s. But by the turn of the decade, the people of the Northwest came to see that conservation and decentralized generation can meet our energy needs well into the foreseeable future. The utilities suddenly discovered that they had planned to construct too many power plants. Now they tell us that the region has a power surplus expected to last through the end of the eighties.

BPA and many utilities claim that, since we are no longer faced with imminent shortages, we no longer need to invest in alternatives to thermal generation. Yet, incredibly, these same utilities are still trying to complete construction of new thermal plants that would drain the region's financial resources. These utility claims and commitments should be vigorously challenged.

Instead of continuing with the approach that brought us an increasingly unaffordable power supply careening between shortage and surplus, utilities can rethink their power planning methods, and can develop a regional power system that is affordable, reliable and flexible. Conservation and decentralized generation are a sounder basis for a regional power system than new thermal generation.

Affordability

These alternative options are less expensive than new thermal plants, even when conventional projects are already partially built. Even utilities admit that the cost of new power plants is going to keep going up much faster than the general rate of inflation. New thermal plants could prove to be much more expensive than expected, both to build and to operate. Conservation costs are comparatively stable.

Investment in conservation will help ratepayers deal with high electric bills which have resulted from high rates and poor energy efficiency. Any ratepayer in the Northwest who receives an electric bill higher than \$50 per month in winter can almost certainly benefit from installing effective conservation measures. A power surplus is no excuse for ignoring the needs of people who live in underinsulated homes, many of whom receive electric bills of \$150 and more during the winter months.

By assisting ratepayers, utilities will improve the quality of life for the public they serve, by insuring that no more household money than necessary is diverted to pay for electricity. Many ratepayers are served by utilities with interest-free residential conservation programs. These programs help hold down power bills when rates are increasing. Utilities which do not provide this service are denying ratepayers essential protection from the soaring rates we now face

in this region.

We can sell the energy freed up by conservation to utilities outside the Northwest. This power can be sold at a price high enough to cover the cost of developing our conservation resources. Such a power sale would bring the region more income than current utility plans for sales of thermal power at one-quarter to one-third the cost of building and operating thermal plants. The Northwest would become more financially stable because of the sale, and other parts of the western United States could use our relatively low-priced energy to reduce their dependence on imported oil for generating electricity. **RELIABILITY:** As the region grows to depend on a diverse, resilient energy supply, **the whole Northwest power system becomes more reliable.** The consequences of a wind generator burning out or storm window breaking are considerably less devastating than the consequences of a large generating plant breaking down on a cold January day in a drought year.

Most conservation measures require little maintenance and will last at least as long as (and probably longer than) thermal plants. Many conservation and decentralized generation measures work best in the winter, when we need power most. Conservation can help solve the problem of fishery enhancement, a requirement of the Northwest Power Act, by reducing peaking loads on the region's rivers (POWER has an issue paper available on Power Production and Fishery Enhancement.)

Flexibility

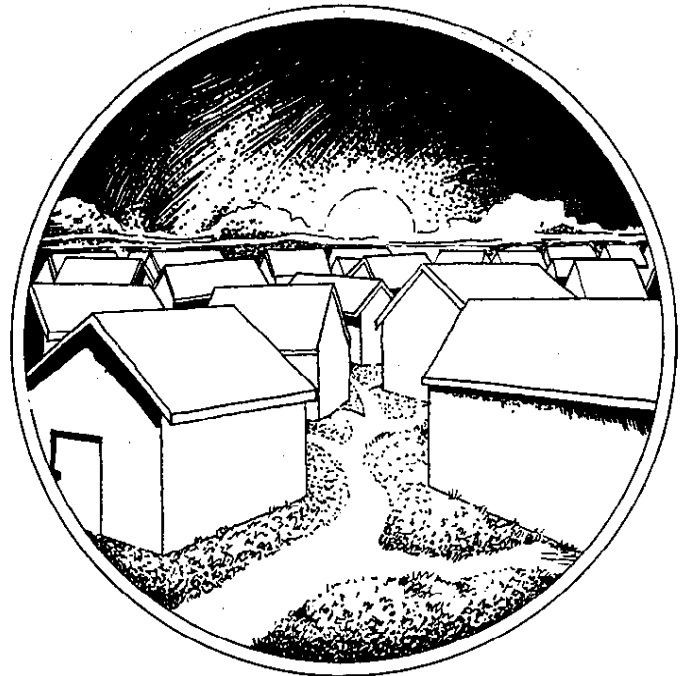
Conservation and decentralized generation can be put to use as they are needed. It doesn't take long to plan and build a small wind generator; it takes even less time to insulate an attic. Unlike large, centralized generation plants, these alternatives do not tie up large amounts of capital for long periods of time. Communities can plan to meet their energy needs as they come up, and can avoid the problems of surplus and shortage caused by unreliable forecasts of energy demand. The money and resources freed up by a flexible approach to power planning can help to rebuild the regional economy, instead of being diverted to expensive energy projects that threaten to destroy it.

The Northwest Power Planning Council has recognized the advantages of the flexibility which small projects provide, and has endorsed a program of "planning for uncertainty," meeting future energy needs with a lot of small projects, rather than a few large ones. Ratepayers can encourage utilities and local governments to adopt a decentralized, resource conserving approach to energy planning, and thereby contribute to the Power Council's goal.

NORTHWEST CONSERVATION LOAN PROGRAMS: A SUMMARY

	CONSERVATION MEASURES					SPECIAL PROGRAMS						
PRIVATE UTILITIES												
PUGET POWER	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PACIFIC POWER	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
WASHINGTON WATER POWER	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PORTLAND GE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
IDAHO POWER	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PUBLIC UTILITIES												
BENTON PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CLALLAM PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CLARK PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
COWLITZ PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
GRAYS HARBOR PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LEWIS PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
MASON PUD #1	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
MASON PUD #3	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PACIFIC PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PEND O'REILLE PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
SEATTLE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
SNOHOMISH PUD	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
TACOMA	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
RESIDENTIAL AUDITS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LOW INTEREST LOANS			YES			BPA	BPA	BPA	BPA	BPA	BPA	BPA
NO INTEREST LOANS	YES	YES	YES	YES	YES	BPA	BPA	BPA	BPA	BPA	BPA	BPA
CONSERVATION GRANTS	YES	YES	YES	YES	YES	BPA	BPA	BPA	BPA	BPA	BPA	BPA
FLOOR INSULATION	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
WALL INSULATION	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CEILING INSULATION	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
STORM WINDOWS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CAULKING & WEATHERSTRIPPING	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LOW INCOME RATEPAYERS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
SENIOR CITIZEN RATEPAYERS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
HEAT PUMP CONVERSIONS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
SOLAR WATER HEATERS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
COMMERCIAL CONSERVATION LOANS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CONSTRUCTION SUBSIDIES FOR NEW BUILDINGS



SOLAR WASHINGTON

New buildings served by your utility cost you money. When new customers hook up to your power system, the utility builds new expensive power plants to meet their needs, and must raise rates to cover the new plants' costs.

Until 1970, many utilities actually paid subsidies to new home builders to encourage them to build all-electric homes. But since then, rising energy prices have forced utilities to change their policies for new customers. Some companies are now considering special standards for new buildings.

The Problem

Existing building codes do not take into account the rising cost of energy. The current standards were established several years ago, and were based on the retail electric rates in effect at that time. As a result, new buildings have relatively low insulation levels, use a great deal of energy, and waste much of what they use.

Senior citizens on fixed incomes and low income families typically do not live in new homes, but still must pay higher electric rates whenever new power plants are built to meet the needs of new homes. Therefore, low income ratepayers and the general public should advocate policies to encourage the wise use of energy in new homes.

Subsidies For Energy-Efficient Buildings

BPA and some utilities have considered paying a subsidy to builders of new energy-efficient homes and businesses as a conservation incentive. Although existing ratepayers would have to bear the cost of this subsidy, they would also receive the benefit of smaller rate hikes, because fewer new power plants would be required if new buildings were efficient.

Most subsidy proposals have focused on residential buildings. Homes built to the current Washington State Energy Code, with modest insulation levels, use about 17,000 kwh/year, if electric resistance heat is installed. If builders installed additional conservation measures costing about \$2000, annual power use could be reduced to

about 10,000 kwh.

The power savings from this conservation investment would eliminate the need for new power generating capacity that would cost about \$6000 to build. If a \$2000 incentive payment would cause builders to make the changes, even one would be better off. The buyer of the new home would pay no more for the house, and would enjoy lower power bills. Other ratepayers would otherwise have had to pay for new power plants to provide the power being wasted. The Northwest Power Planning Council has authority to establish "model conservation standards." These standards will set goals for local utilities, which will be penalized by a surcharge on the wasted energy if the goals are not met. Residential building standards are among the model conservation standards now under consideration. (See section of this manual on Model Conservation Standards.)

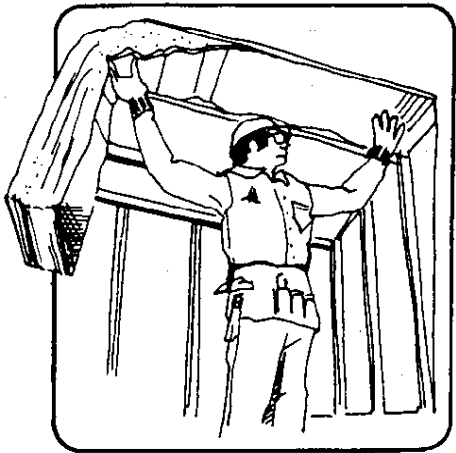
Unlike building codes, the model conservation standards will only apply to electrically heated homes. As a result, many homebuilders may choose to install gas heat rather than electric heat to avoid the regional standards. As a result, there would be much lower electricity use and correspondingly lower rate increases, although we will use larger amounts of other fuels.

Ratepayers can justify stricter codes by pointing out that new homes place greater demands on the existing electrical system, forcing rates higher. In exchange for sharing the existing low-cost facilities, built to serve existing customers, new customers should be willing to use electricity efficiently.

Summary

Both subsidies and standards would effectively reduce growth in electricity use, would decrease heating costs for purchasers of new homes, and would slow the upward spiral of electric rates. The BPA proposal might result in higher rates, due to shifts to electric heat by consumers who would otherwise use alternatives. Consumers should advocate the lowest-cost alternative, strict model conservation standards, to bring new buildings into a sound and sane energy plan.

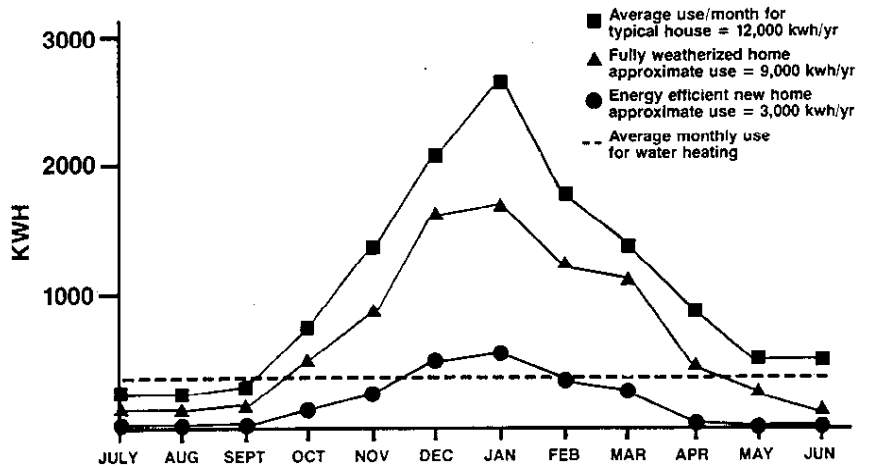
MODEL CONSERVATION STANDARDS



ENVIRONMENTAL ACTION

Average monthly space heating use

Seattle/Portland



Conservation is the key to a sound energy future for the Northwest, and Congress passed the Northwest Power Act in 1980 to help encourage the region to save resources. The Act calls for the development of "model conservation standards" by the Northwest Power Planning Council. The model conservation standards, according to the law, must "include, but not be limited to, (A) standards applicable to new and existing structures, (B) utility, customer, and governmental conservation programs and (C) other consumer actions for achieving conservation.

This is probably the most aggressive portion of the Northwest Power Act. The standards should produce all power savings that are cost-effective for the region and economically feasible for consumers, with financial assistance from BPA. The model conservation standards are expected to include the following types of programs:

- 1) Residential and commercial building codes, and utility financial assistance for certain measures;
- 2) Utility-financed audits and conservation installation programs for existing residential and commercial buildings;
- 3) Lighting codes for existing commercial buildings;
- 4) Utility investment in cost-effective process efficiency improvements and cogeneration in the industrial sector;
- 5) Regulatory and incentive programs for low income consumers.

The model conservation standards may be extensive and aggressive, if the Power Council accepts the findings of most studies that massive amounts of energy can be made available cost-effectively through aggressive conservation and renewable resource programs.

Under the terms of the Power Act, jurisdictions which fail to adopt the model conservation standards, or their equivalent, could face substantial rate penalties imposed by BPA at the direction of the regional Power Council. The Power Council will base its power plan for the region partly on the

amount of power expected from conservation and renewable resource programs. If some areas fail to implement the standards, the entire region could face a power shortage.

These regulatory and incentive programs are an indispensable part of a sound regional energy program. Rate increases alone are not a fair way to encourage development of conservation and renewable resource programs, because those most seriously affected are those least able to respond: the elderly and the poor. But if the Power Council directs the utilities to begin aggressive conservation financing programs, these programs will help those who cannot afford conservation on their own to hold their power costs in line. Low income consumers have an especially high stake in conservation. They are least able to make the investments themselves for conservation measures, and most in need of these measures as energy prices increase.

The Northwest Power Council will hold public hearings when the model conservation standards are prepared for adoption. Consumers can appear at these hearings to support conservation measures which are cost-effective compared with new thermal power plants. Strong conservation programs will minimize future rate increases.

Consumers can encourage utilities and local government agencies at the local level to put the recommended programs into effect as soon as possible, so that consumer power bills will be minimized, and so that the conservation measures can be recognized early on as dependable sources of energy. This will help to forestall the need for additional expensive thermal power plants, and hold everyone's rates down in the long run.

Utilities which refuse to implement the standards can be assessed a surcharge of 10% to 50% on the wholesale power they buy from BPA. If utilities and local government units agree to support the program, rather than oppose it, the region can work together to save energy and money.

BILLING CREDITS

Congress included a provision in the Northwest Power Act for promoting utility investment in conservation and renewable energy resources. Utilities will receive "Billing credits" for independently developing energy resources and conservation programs, and for reforming their rates to encourage energy conservation.

These billing credits, applied against wholesale power purchases, will rebate to utilities the costs BPA saves when new resources are developed without BPA backing. Since any new resource developed by BPA drives up wholesale power rates for the entire region, all ratepayers benefit when some utilities develop resources on their own, instead of depending on BPA for all of their power needs.

Billing credits make a lot of sense for the Northwest's ratepayers, but BPA is not doing all it could to make the program work. The agency is providing a much weaker incentive than Congress intended. Consequently, utilities are using less innovation in developing conservation programs, less creativity in designing new rates, and less effort in developing new small-scale renewable energy generating plants.

Billing credit advocates, during the development of the Northwest Power Act, expected BPA to pay up to the cost of power from coal and nuclear plants. BPA has refused to do this, saying that, by paying this amount, it will be forced to raise rates for its other customers sooner. But this policy hurts all ratepayers, because as the demand for power increases, the agency will be forced to build expensive new plants, causing everyone's rates to increase.

Consumers can urge utilities to implement creative programs and can ask their utilities to pressure BPA to strengthen the billing credit program. It appears that BPA will not develop a workable program of billing credits for local projects until utilities demand one.

As local utilities develop their own resources, implement conservation programs, and reform rates, they should ask BPA to grant the billing credits they deserve. If enough utilities initiate programs, and demand billing credits, BPA will have to respond.

Local energy activists should know that utilities which do take the initiative on energy conservation are entitled to billing credits for their efforts. Utilities resisting efforts for rate reform or other innovative solutions to current energy problems may become more receptive once they know BPA should compensate their efforts at a very high rate.

How Billing Credits Are Supposed To Work

The program credits utilities with the difference between the cost of the most expensive power from a new facility and the average cost of all of BPA's power. For example, if power from a new facility, such as the Creston coal plant, is estimated to cost 10 cents/kwh, and BPA's average rate is 2 cents/kwh, billing credits would be allowed at a rate of 8

cents/kwh. A utility developing any resource independently of BPA, whether an aggressive conservation program, a small hydro site, or a wind turbine, would be allowed an 8 cent reduction in its BPA bill for each kilowatt-hour produced by its independent resource.

This credit would not harm other BPA customers. If, instead of developing its own resource, the utility had simply purchased additional power from BPA, the price would have only been 2 cents/kilowatt-hour, the average BPA rate. BPA, however, would have had to pay 10 cents/kilowatt-hour to get the additional power. All customers would have faced rate increases to cover the difference. The rebate of 8 cents/kwh for the resource the utility developed has exactly the same effect on BPA rates as the cost of the power BPA would otherwise have had to produce.

Of course, some independent resources would cost much less than 10 cents/kwh to develop. Billing credits would provide a "bonus" to utilities which make an effort to save money by obtaining power at a lower cost than BPA can. By aggressively pursuing such alternatives, utilities could hold down their own power rates, while utilities depending on BPA for all of their power needs would continue to pay increasing rates.

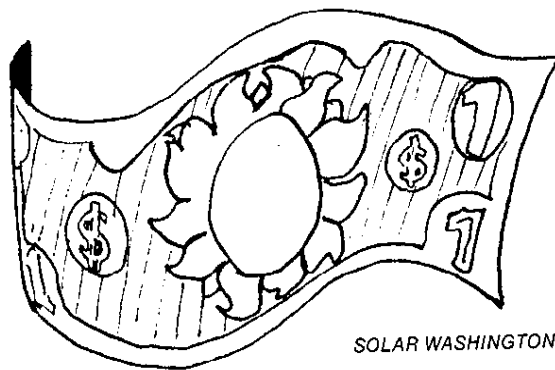
At a billing credit rate of 8 cents/kilowatt-hour, if a utility were to conserve 5 million kilowatt-hours a year through rate reforms or conservation programs, it would be entitled to a billing credit of \$400,000 per year. If its BPA bill for 100 million kilowatt-hours that year, at a price of 2 cents per kilowatt-hour, was \$2 million, billing credits would create a 20% reduction in its bill, in response to a 5% reduction in its load. Obviously, billing credits provide a strong incentive for utilities to conserve.

BPA is not expected to pay more for independently generated power than the actual cost of developing the resources. Although conservation programs can actually produce a profit for the implementing utility, BPA only grants billing credits up to the full cost of a renewable generating resource. The utility doesn't earn any extra discount, but it gets a power generator for free, and it gets to keep and sell the power produced. As a result, the billing credit program will provide a strong incentive for independent development of resources by local utilities.

Conclusion

The development and implementation of an effective billing credit program is one essential tool for promoting a least-cost energy future for the people of the Northwest. By rewarding competitive efforts to meet energy needs creatively, billing credits can ensure that cost-effective conservation and renewable energy resources are developed quickly and economically. But the success of the program depends on BPA's wholehearted support. Consumers and their local utilities can show BPA that they are ready to use billing credits to their fullest potential.

SOLAR LOAN PROGRAMS



SOLAR WASHINGTON

The Northwest needs the energy resources of conservation and renewable alternatives. Without a strong push to develop these resources, the region faces spiralling energy prices and economic instability. The Northwest Power Act was passed by Congress in 1980 to ensure that the region's utilities will develop financing programs and incentive mechanisms to make full use of our conservable and renewable energy, but BPA and the Northwest's utilities have not gone far enough yet toward achieving that goal.

Solar loan programs in the Pacific Northwest are currently inadequate, especially when compared to what is available in other parts of the country, notably California. As one Northwest utility official put it, "solar is still new to us and we're still learning." Utility officials and citizens alike can support solar by studying financing models and tax credits for the successful development of the renewable energy industry in the Pacific Northwest.

Federal tax law allows solar investors to receive a 40% federal tax credit for solar investments up to \$10,000. The current administration has proposed eliminating this credit, although that would deal a crippling blow to the solar industry in Washington state. Washington presently offers no direct state tax credits for solar or other residential renewable energy improvements, other than to exempt the value of such a system from the owner's property tax.

Existing Solar Loan Programs

Under the Northwest Power Act, the Federal Bonneville Power Administration will lead the nation's utilities into a new electric power policy revolving around conservation and renewable resources. BPA officials admit, however, that the current solar loan program is cumbersome and outdated.

Presently, BPA is engaged in a pilot solar domestic hot water heater (SDHW) program with six of the region's public utilities, but few public utilities in the region are currently doing any solar loan programs independent of BPA. Both BPA and the public utilities are waiting for the results of the Regional Power Planning Council's 20-year forecast and power plan, which will include conservation and renewable energy development standards for all of the region's utilities. Public utilities may also be apathetic because they have little experience with solar concepts and applications. They are reluctant to move away from their commitments to

large coal and nuclear plants. (See section of this manual on why to invest in conservation although there is a surplus.)

Although the power industry is still unfamiliar with solar, private utilities in the region are experimenting with solar grant and rebate programs. Unfortunately, these programs lack enough creativity and boldness to overcome the high initial costs of SDHW systems and passive solar systems. Puget Power offers cash grants for SDHW systems which comply with the applicable material and building codes in the installer's county. However, Puget's program provides only a \$300 subsidy to a SDHW system — less than half of the support provided by BPA's pilot program. Puget also offers no-interest loans to consumers for passive solar retrofits.

Washington Water Power (WWP) and Idaho Power (IP) are offering identical solar rebate programs. They refund 20% of the cost of the installed SDHW system, in addition to the 40% federal tax credit. Each program is a pilot effort by these utilities, with only 100 SDHW units offered per program. IP regards its program as a test for both the efficiency of SDHW and the ability of dealers and contractors to handle solar technologies.

What Should Utilities Be Doing?

Utilities should finance solar investment exactly the way that they finance power generation, conservation, or any other resource development program. If the energy saved by a solar project costs less than the energy produced from some other alternative, the utility should choose the solar project. (See section of this manual on why utilities should invest in conservation.)

If the power saved by a residential solar water heating system is cost-effective, the utility should provide 100% financing. The customer should be able to pay back the loan over a long period, so that the payments never exceed the savings due to the solar installation.

For commercial and industrial solar developments, the same approach should apply, subject to the limitations of state law. As long as solar investments are considered "power resource developments," however, the utilities have the authority to invest as necessary to provide power for their future needs. With full cooperation between consumers and utilities, the Northwest can make good use of the sun in its energy plans.

COGENERATION AND SMALL HYDRO DEVELOPMENT

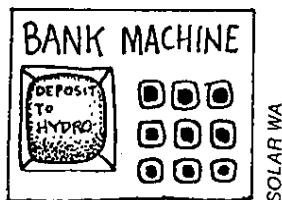
You can sell power to your utility company. Under the Public Utility Regulatory Policies Act (PURPA), large utilities must offer to purchase the output of cogeneration projects (plants which produce useful heat and electricity at the same time) and of small hydroelectric developments (plants which turn the energy in falling water into electricity). So far, the utility companies of the Northwest have not made much effort to encourage their customers to take advantage of this provision of PURPA. It's up to the people of the Northwest to insist that utilities help consumers develop these valuable resources.

Currently, Idaho Power is the regional leader, with contracts for five projects totalling over 5 megawatts. Idaho Power pays about 6 cents/kwh for this power — somewhat less than the cost of power from new coal or nuclear plants.

Once the banking community overcomes its caution about cogeneration and small hydro reliability and discovers how lucrative the market is for these types of projects, Idaho Power hopes to provide much of the new power its customers need from cogeneration and small hydro. Right now, however, private energy developers are having difficulty raising capital to build the small plants.

If your utility is not willing to pay as much as Idaho Power for independently produced power, it is not doing its share to minimize regional power costs. Other utilities are beginning to make progress in this direction. Puget Power, for example, has agreed to buy power from the Boeing Company at a rate of about 5 cents/kwh.

Some public utilities are only willing to pay the current BPA wholesale rate for independently generated power. These utilities should be made aware that, under the billing credit provision of the Northwest Power Act, BPA will pay them "billing credits" when they acquire new power sources. These billing credits are an incentive for utilities to pay independent power producers a price equal to the cost of power from a new coal or nuclear plant. (See section of this manual on billing credits.)



Cogeneration and small scale hydro power projects are much more readily available than many utilities are willing to admit. The Northwest could use cogeneration to produce as much electricity as two nuclear power plants, at lower cost than coal or nuclear plants. Small scale hydro has even greater potential here. Small dams could produce as much power as 8 nuclear plants, according to one study. The Fed-

eral Energy Regulatory Commission has received permit applications from the Northwest for over 7000 MW of new hydro capacity in the last three years alone.

Utilities should look to small scale cogeneration and hydro projects as a future source of power supply, if conservation measures alone cannot provide the energy needed in the Northwest.

How Can Utilities Finance Cogeneration And Small Power Production?

Public utilities can issue their own revenue bonds for development of local resources like cogenerators and hydro sites. Private developers who want to install these facilities, can obtain low interest financing under state and federal laws.

In Washington state and elsewhere, public utilities may issue tax-free municipal bonds, like those used by the WPPSS consortium, to finance alternative energy projects. Local PUDs may independently finance development of renewable energy resources within their service area. In Washington, PUDs and municipal utilities can also give no-interest loans to individuals to install renewable resources, under a constitutional amendment approved by the voters in 1979.

The recently passed "industrial revenue bonding authority" in Washington (already in place in Oregon and Idaho) allows both public institutions and private developers access to tax-free municipal bonds to build small energy projects. This bonding authority could enable a local government agency to set up a separate corporation to develop cost-effective solar, small hydro, and cogeneration. The corporation could issue bonds to finance energy projects. Once completed, the corporation could sell the projects' power to the local utility at high enough rates to pay off the bonds. If properly managed, this would encourage local economic development and yield lower energy costs to consumers.

The success of such a venture would depend on citizen and local government oversight. If the WPPSS case is any lesson at all, we now know that the public and local government must play a more active and responsible role in the formation and implementation of resource development policies.

Consumers can pursue the development of a locally-based energy development corporation by pressuring elected county officials, including not only county commissioners and PUD commissioners, but also port district commissioners, school board members, or any other local government officials who would consider sponsoring such an effort. The effort would increase local employment as well as revenues from the sale of power. The lower interest rates available as a result of tax-exempt financing can make these projects competitive.

TECHNICAL APPENDIX: COST OF SERVICE ISSUES

COST OF SERVICE STUDIES

Cost of service studies are complex technical analyses designed to determine which customers are responsible for the various costs of providing electric service. A cost of service study should help utility regulators set rates in such a manner that each group of customers pays for the costs which they cause the utility to incur.

Different utilities use different cost of service methodologies. (See section of this technical appendix on Cost of Service Methodologies.) Many of these were developed long ago, or in other regions of the country, and may not be appropriate for use in the Pacific Northwest in the 1980's. However, all cost of service methodologies have many common characteristics, and are subject to many of the same pitfalls.

If ratepayers succeed in getting local utilities to use modern, progressive cost of service techniques, most residential ratepayers will save money, and all ratepayers will pay rates which more closely approximate the costs of providing energy to them. Under many current methods, small power users, and the residential and small business classes in general often subsidize large business and industrial customers.

Consumers should understand that such studies are as much political as technical, and that the results of any one study should not be allowed to go unquestioned. Experts disagree about how to allocate certain fixed costs among different customer classes. Consumer advocates often argue that the fixed costs should be allocated primarily based on total energy consumption. Then residential and small business rates will be slightly higher than industrial rates, but the large quantity discounts which might have been justified in the past will be reduced greatly. (See section of this technical appendix on marginal versus embedded cost of service studies.)

Some consultants and industrial customers argue that these fixed costs should be allocated based on the peak load of each customer class, or based on the total number of customers in each class. Under their recommendations, residential and small business customers will pay too much, large power users will receive lower rates and conservation efforts will be reduced. (See section of this technical appendix on cost of service methodologies.)

The Steps Of A Cost Of Service Study

Cost of service studies begin with "functionalization," dividing the various costs of the utility into different categories. Costs are assigned to such categories such as "power supply," "transmission," "distribution," "services," and "general and common" expenses.

Power supply expenses are associated with generating plants, purchase of power, fuel costs and similar expenses. Transmission expenses cover facilities like the powerlines which run from the power plants to the local substations. (This category does not generally include the transmission lines owned by other power suppliers, such as the Bonneville Power Administration; only facilities at the local level are considered.) Distribution expenses include the costs of substations, power lines to customers' houses, meters and transformers. Services include meter reading, billing, maintenance, customer information programs and research programs. General and common expenses are for administrative headquarters, maintenance shops and other facilities used for coordinating all services. Some subjective judgment enters into the functionalization of costs, but this particular step of a cost of service study is not as controversial, arbitrary, or important as the remaining steps of the determination of appropriate costs for each class.

The next step of a cost of service study is "classification." In this step, all of the functionalized costs are sorted into categories of **energy costs**, **demand (or capacity) costs**, and **customer costs**. (See box from Environmental Action at the end of this article.) Classification is a highly subjective step in the cost of service process. At this point, residential and small business customers are generally assigned the bulk of the utility costs, to the benefit of large industrial customers.

Customer Costs

Customer costs should be only those costs which vary in direct proportion to the number of customers served by the utility. These costs are typi-

cally divided equally among the customers, regardless of their consumption of electricity.

If a customer were to divide a house into a duplex, and the total energy needed by the two different living units were exactly the same as before, no additional distribution lines would have to be built, although a second meter would be installed and a second bill sent. This suggests that distribution facilities are not "customer related" costs, since the cost of distribution facilities does not vary proportionally to the number of customers.

Minimum distribution costs do not really vary with the energy or capacity requirements of a system. The utility must install a pole of some size to support a wire, no matter how thin the wire, and the cost of installing the pole is a function of labor and equipment costs, not of the amount of power that will flow over the lines. A pole, once installed, can carry one customer's power or a hundred. The minimum distribution costs do not vary with energy (the total amount of power a customer uses) or with demand (the maximum a customer ever needs), but no category is provided in most cost of service studies for unallocable costs like the cost of the pole.

The "minimum distribution system" approach seriously overcharges urban customers and those who use very little electricity. A minimum distribution system analysis calculates the minimum cost needed to distribute a tiny amount of power to each consumer. This cost is classified as a "customer" cost, and additional distribution costs are classified either as demand (in old-fashioned studies, as outlined below) or as energy (in more progressive studies).

Utilities typically serve mixed urban/rural populations, and their minimum distribution costs in outlying areas are much higher per customer than in urban areas. A substation can serve an almost unlimited number of customers as long as they live close together, and as long as each of them uses very little electricity. However, because some customers use a lot of electricity, and others live far apart from one another, the utility needs more than one substation. A typical cost of service study, however, may allocate part or all of the cost of substations to customer costs, treating them as minimum distribution equipment.

Many consultants also classify distribution lines, meters, poles, transformers and numerous other costs to the customer cost category. As a result, the cost of expensive distribution facilities only needed by a few customers are lumped into the customer cost category. Then all customers must pay for these facilities equally, even though they do not use them equally, and even though the costs do not really vary with the number of customers.

A proper study would distribute the cost differently to the various users. Very few actually do, and essentially all utilities charge their urban and rural customers the same rates. This forces urban dwellers to subsidize their rural neighbors. Cost of service studies should recognize that minimum distribution costs do not vary with the number of customers, but rather with the density of those customers. The minimum distribution approach fails to limit customer costs to those costs which vary with the number, not the density, of customers.

This is only one of the political judgments which are often concealed under a cost of service study's pile of computer output and technical language. Often such miscellany as "uncollectible accounts" (the bad debts left by customers leaving an area) are allocated to customer charges, even though they are not caused by all customers equally. Other customer charges often include such things as utility organizational membership dues, utility headquarter buildings, and other real costs of the utility which cannot be objectively allocated to any of the three categories. We need new techniques for handling these presently unallocable costs.

In Oregon, for example, the Public Utility Commissioner has determined that charging minimum distribution system costs as customer costs would not provide any conservation incentive. To reform utility rate structures in his state, he has limited the monthly service charge to a nominal \$3.00 per month (to cover appropriate customer costs such as meter reading, billing and accounting) and has raised the charges for "capacity" and for "energy" to recover the revenue for hard-to-allocate items that might otherwise be charged as customer costs. This shift in allocation helps to promote conservation, to treat small users fairly and to hold down rates in the long run.

When evaluating a cost of service study, ratepayers should ask of each allocation to customer costs: "Does this cost really vary with the number of

customers?" If not, allocating it to customer costs will result in overcharging small residential and business ratepayers, and undercharging large energy-intensive industrial customers. Likewise, any cost which does not vary with peak load should not be allocated to capacity.

Capacity Costs

Capacity-related (or demand-related) costs are the costs which vary with the maximum peak load of the utility system. Since the utility must have sufficient generation, transmission and distribution equipment available to meet the greatest demands of its customers, cost of service studies assign these costs to different customer classes, depending on the pattern of their energy use.

The class which causes the peaks should in theory pay the costs associated with them. Unfortunately, most studies unfairly place far more than the actual cost of serving the peak loads on the residential and small business classes, which have highly variable demand. The industrial customers, who have level demand and who contribute somewhat less to the peak loads, often pay less than their share.

If your utility bases its capacity costs on anything other than the cost of peak load powerplants (such as extra hydro turbines) and the incremental transmission and distribution costs needed to meet peak loads, it is overcharging residential and small business customers. Expenses such as transmission facilities and generating plant capital costs are frequently allocated exclusively to demand and divided among all customers based on their peak load. Since residential customers, particularly those who use electric heat, have high peak loads, this approach allocates the bulk of these costs to them. This allocation is unfair because the costs of these facilities is not exclusively related to peak loads; transmission facilities and generating plants are needed to meet off-peak needs as well, and all customers should share in the costs.

This approach is also inconsistent with studies often prepared by the same consultants which allocate distribution costs on a "minimum distribution" basis. If the same techniques were used, the basic costs of the transmission system (right of way costs, transmission towers, etc.) would be treated as customer costs, since they are needed regardless of the power use per customer. Only the incremental costs of strengthening the transmission system to meet peak loads would be treated as a capacity cost. By including the whole transmission system in capacity, these studies further overcharge small consumers.

Transmission costs fall into two categories. The first category includes right of way and tower costs (the costs of the land under the lines and of building structures to support the line), which are independent of peak load. These expenses are properly allocated to energy costs because they do not vary with the peak load. Even if loads were equal at all hours and during all seasons, these costs would remain the same. Therefore, progressive rate design should treat these as an energy cost — a cost of providing any kilowatt-hour, on or off the peak.

Another transmission cost is the extra cost of building a larger transmission system in order to meet peaks. This small extra cost for stronger towers and thicker wires is genuinely attributable to meeting peak demands. Unfortunately, most studies written for utilities by consultants allocate both of these types of costs to peak load, so residential customers end up paying more than their share.

These same consultants often saddle small consumers with too large a share of the cost of baseload generating plants. The fixed costs associated with these plants are incurred primarily to meet baseload energy requirements. Unfortunately, some cost of service studies treat the fixed costs of baseload plants as capacity or demand costs. Thus, residential and small business customers end up paying for the expensive baseload plants, built at least partly to meet the steady energy demands of industrial customers.

Instead of charging residential and small business customers for all of these baseload costs, cost of service studies should determine the minimum costs of providing peak load service from extra hydro turbines, and should base calculations of capacity costs on that minimum. If baseload plants cost more than that minimum for peaking facilities, the extra costs should be allocated to energy costs, rather than peakload capacity costs.

Energy Costs

The final category, energy costs, should contain most utility costs, including all costs which are related to the total number of kilowatt-hours needed by a utility's customers. Unfortunately, many studies (particularly those done for Public Utility Districts) often allocate nothing more than the BPA wholesale energy charge to this category, although many other costs are directly or indirectly attributable to energy requirements.

Coal and nuclear powerplants, which must run continuously to be cost-effective, serve primarily to meet energy needs rather than peakload or per-

customer needs, so their costs are energy costs. The costs of transmission systems, system maintenance and conservation programs are primarily incurred to meet energy needs. Transmission losses, measured in Kilowatt-hours, should be classified as energy costs. Many cost of service studies classify these instead as demand and customer costs, effectively overburdening small energy users.

By misclassifying energy costs to demand and customer cost categories, utilities force customer classes which use large amounts of power at the peak, or who use little energy per customer, (specifically residential and small business customers) to pay the lion's share of costs.

How Do Different Utilities' Rates Compare To Different Kinds Of Customers?

Private utilities, regulated by the Oregon and Washington utility commissions, tend to allocate a greater proportion of costs to "energy" than do PUDs, which use typical consultant cost of service studies. Because of this difference in approach, some industrial customers in the Northwest pay widely different rates as high or nearly as high as their residential rates, while others have very large quantity discounts for their industrial customers and correspondingly higher residential rates.

The table below shows the relative costs for residential and industrial service for several Northwest utilities. Industrial customers of PUDs pay less than they would under the cost of service methodologies used by the state regulatory commissions.

The table also shows the rates for a number of out-of-region utilities to demonstrate that utilities all over the country treat their residential customers more fairly than do the PUDs here in the Northwest, even though rates are generally higher in other parts of the country than they are here. (This discrepancy is partially a result of the Northwest's inexpensive hydro-power compared to the high-priced oil and nuclear power used elsewhere.)

COMPARISON OF RESIDENTIAL AND INDUSTRIAL RATES
SELECTED NORTHWEST AND MAJOR NATIONAL UTILITIES

UTILITY	RESIDENTIAL BILL (1000 KWH)	COST PER KWH	INDUSTRIAL BILL (400 KW; 150,000 KWH)	COST PER KWH (CENTS)	RATIO OF RESIDENTIAL TO INDUST. RATE/KWH
PACIFIC NORTHWEST PUBLIC UTILITIES					
BENTON PUD	29.90	2.99	3593.50	2.40	1.25
CLARK PUD	31.91	3.19	3017.50	2.01	1.59
COWLITZ PUD	14.80	1.48	2564.63	1.71	.87
GRAY'S HARBOR PUD	22.50	2.25	3044.00	2.03	1.11
CITY OF RICHLAND	34.26	3.43	3500.50	2.33	1.47
SNOHOMISH PUD	29.55	2.96	3553.00	2.37	1.25
CITY OF TACOMA	20.45	2.05	2169.00	1.45	1.41
			AVERAGE:		1.28
PRIVATE UTILITIES					
PACIFIC POWER	29.54	2.95	5320.00	3.55	.83
PORTLAND GE	33.75	3.38	5864.00	3.91	.86
PUGET POWER	28.82	2.88	3523.20	2.35	1.23
WASH. WATER POWER	22.50	2.25	3786.00	2.52	.89
			AVERAGE:		.95
OUTSIDE THE PACIFIC NORTHWEST					
AUSTIN, TEXAS	44.56	4.46	8940.75	5.96	.75
BOSTON EDISON	104.98	10.50	14051.85	9.37	1.12
COMMONWEALTH ED.	75.40	7.54	9904.00	6.60	1.14
CONSOLIDATED EDISON	109.10	10.91	17439.20	11.63	.94
FLORIDA POWER & LIGHT	58.67	5.87	8154.00	5.44	1.08
GEORGIA POWER	52.21	5.22	7691.70	5.13	1.02
HOUSTON LIGHTING	82.02	8.20	10439.02	6.96	1.18
LONG ISLAND LIGHTING	114.56	11.46	13326.90	8.88	1.29
LOS ANGELES DWP	71.63	7.16	11136.50	7.42	.96
NORTHERN STATES	56.42	5.64	5939.55	3.96	1.42
PACIFIC GAS & ELECTRIC	69.98	7.00	13295.00	6.96	.79
PHILADELPHIA ELECTRIC	78.90	7.96	12184.59	8.86	.88
PUB. SVC. OKLAHOMA	52.81	5.08	6208.15	4.14	1.23
TAMPA ELECTRIC	63.07	6.31	8159.00	5.44	1.16
TEXAS ELECTRIC	66.52	6.65	8072.85	5.38	1.24
			AVERAGE:		1.09

SOURCE: WPPSS OFFICIAL BOND STATEMENT, MAY 1982

You can make a similar comparison for your own utility. If local industrial customers get a "quantity discount" of more than about 15% compared with residential rates, chances are that your utility is allocating too much of its costs to customer and capacity, and too little to energy. Remember that in order to calculate the average cost per kwh of an industrial customer, you must consider both the "demand" charge (per kw) and the "energy" charge (per kwh). (See the technical appendix on rate design for an explanation of commercial and industrial rates.)

Many utilities, such as the Cowlitz County PUD, specifically reserve their lowest cost hydroelectric power for residential customer use. These utilities' residential rates are actually lower than industrial rates.

The cost of service methodology used by the Public Utility Commissioner of Oregon provides a model example to other utilities. This method, used in Oregon for about 8 years, yields relatively small "quantity discounts" for

large industrial customers, provides effective incentives for conservation to all customers and results in lower rates for residential customers. As you can see from the table, residential rates for the Oregon utilities (Pacific Power and Portland General Electric) are lower than for many of the PUDs, even though the private utilities only get 60% of the power for their residential ratepayers from BPA and must generate the rest themselves, at higher cost. You can ask your local utility to use this methodology. (See section of this technical appendix on cost of service methodologies.)

The Northwest is incurring massive cost to meet future energy needs, through the construction of new coal and nuclear plants. If rates are based on old-fashioned cost of service methodologies and structured to encourage the use of additional energy, today's rate hikes will continue until the region is bankrupt.

If, on the other hand, utilities adopt progressive rates based on cost of service studies which recognize that most of the avoidable future costs of a utility are related to providing additional energy, future rate hikes may be less devastating. All energy-related costs should be charged as "energy" costs within cost of service studies. This way, consumers who use large amounts of energy will pay rates which more closely approximate the cost of the new facilities being built to serve their large demand.

Even with such an innovative approach, a cost of service study by itself cannot provide the information needed to make the political judgments which are inherent in electric ratemaking. Ratepayers can organize to influence ratemaking decisions so that the costs of energy will be borne fairly by all customers.

Energy Costs vary with a customer's electricity usage. They include such items as fuel supplies, the cost of baseload powerplants, the basic costs of the transmission system and maintenance costs. Because they increase with the number of kilowatt-hours the utility must produce for its customers, energy costs are generally charged to customers on a per kilowatt-hour basis, i.e., three cents per kwh. This is called an *energy charge*.

Demand Costs (also called **CAPACITY COSTS**) are expenditures which relate to the peak load or peak demand of a utility's customers. Demand costs represent investments in equipment needed to serve the company's peak load — facilities like peaking powerplants, the extra cost of overbuilding a transmission system to meet peak loads, or oversized transformers needed to serve electric heat customers in winter. Because these costs reflect a customer's peak demand, rather than overall power consumption, most utilities charge their major customers for such costs through a separate **DEMAND CHARGE** based on each customer's peak demand (in kilowatts). For most smaller customers, demand costs are included in the KWH energy charge.

Customer Costs are costs which vary with the number of customers which a utility serves. These include the cost of maintaining the customer's meter and sending the monthly bill. These are fixed costs which occur even if the customer uses no electricity at all. Some utilities impose a flat customer charge, separate from the energy and demand charges; others include these costs in the rate per KWH, sometimes with a minimum bill, which guarantees that these fixed costs will be recovered if no power is used.

Unallocable Costs are actual utility costs which do not vary with the energy usage of a utility's customers, their peak load, or the number of customers served. These include the basic distribution system costs, which can serve additional customers at essentially no extra cost, the offices and management salaries of the utility, and other costs. While some utilities charge these as "customer" costs, the decision of who must pay these costs is really a political decision, not a technical one.

COST OF SERVICE METHODOLOGIES

Ratesetters in the U.S. use more than 40 different cost of service methods, but only a few general approaches are widely used. The effect of each of these is different; some are favorable to residential and small business customers, while others favor industrial customers. None of the methods are "unchallengably objective."

In years past, when new power plants cost less than existing plants, and when it made sense to encourage the use of additional energy, cost of service methodologies were developed to allocate costs so that customers using large amounts of power received lower rates. Unfortunately many of these approaches are still practiced, even though new power plants are now very expensive.

Newer methods of calculating cost of service are more consistent with today's situation. Extra transmission and distribution facilities and peaking power generators are relatively inexpensive to add to a system, but additional baseload power plants are very expensive. As a result, a modern cost of service method should allocate the bulk of utility costs to baseload energy users (including industrial customers), and only charge the incremental costs of meeting peak loads to customers using extra power during the peak period (including residential and small business customers).

In general, any methodology which allocates fixed generation, transmission or distribution costs based on a single peak period will be unfair to residential customers. Although these customers use more power during the peak than other classes, the cost of "overbuilding" the system to meet that peak is much lower than the overall cost of building the basic system to meet average energy demand. If the average costs are allocated on an energy (per kilowatt hour) basis, rather than a demand (per kilowatt) basis, residential and small business customers will benefit. Unfortunately, the methods used by most public utility districts and municipal utilities fail to do this.

Six of the most widely used cost of service methods are described below.

Marginal Cost Methods

- **Peak Credit Methodology:** The cost of additional peak capacity is set at the cost of power from a combustion turbine; the cost of additional baseload energy is set at the cost of power from a new coal or nuclear plant. Transmission and distribution costs are considered an incremental cost to serve additional peak load, or additional customers. Of the cost of service methodologies in widespread use, this is the most favorable to residential and small business consumers.

The State of Oregon uses a marginal cost of service methodology unique to the Northwest. Since the costs of new resources are higher than the average costs of utilities, the Oregon Public Utility Commissioner sets rates for all customers at an equal percentage of marginal demand and energy costs. The costs often allocated as customer costs, such as metering and billing expenses, are not considered to be relevant for ratemaking, since they are not "avoidable" costs.

As a result, energy costs predominate in rates, meaning that large industrial customers must bear a very large share of system costs, while residential customers have relatively lower rates. This approach is favored by most marginal cost advocates.

Used by: Oregon Public Utility Commissioner, Pacific Power and Light, BPA (considered in wholesale rate design).

- **System Planning Method:** Essentially identical to the Peak Credit method, except that the actual peak and baseload power projects planned by individual utilities are evaluated, rather than the use of theoretical minimum-cost projects.

Used by: Portland General Electric

Embedded Cost Methods

- **Peak Credit:** Similar to the peak credit marginal cost of service method,

this approach determines the lowest cost "peaking" resource (such as a combustion turbine, used only during the time of the peak load) which could have been acquired when baseload plants were built. That portion of a baseload facility cost is defined as demand- (or capacity-) related, and the remainder is energy-related. Transmission and distribution costs can be allocated the same way, or may be allocated on a peak-responsibility basis. The latter results in higher costs to residential and small business customers.

• **Peak Responsibility:** This method allocates all fixed costs in direct proportion to the peak load of each customer class at the time of the system peak load. Since residential customers almost always have the highest load at this time, they bear the bulk of the generation, transmission and distribution costs of the utility system. **THIS METHOD IS MORE UNFAIR TO RESIDENTIAL AND SMALL BUSINESS CUSTOMERS THAN ANY OTHER COST OF SERVICE APPROACH.**

• **Average and Excess Demand:** This approach allocates most fixed costs based upon the average demand of each customer class, and a portion based upon demand over that level. The result is that industrial customers with high "average" demand but relatively small increases at the time of peak loads pay a large portion of the fixed costs, holding down residential and small business rates. This method can be applied either to "coincident" or "noncoincident" peaks; applying it to "noncoincident" peaks will usually result in the lowest rates to residential customers.

Used by: Washington Water Power; some PUD's and Municipal utilities.

• **Sum of 12 Monthly Peaks:** This method allocates fixed costs among classes based upon their share of the sum of the 12 monthly peaks experienced by the utility. As a result, summer peaking customers (such as irrigators and food processors) whose individual peaks differ from the system's total (maximum) peak pay more. Since all fixed costs are allocated based on peak demands, industrial customers, who have hardly any sharp peaks in demand, are the primary beneficiaries of this approach.

These are by no means the only methodologies available. About 10 different marginal cost methodologies have been developed, although the peak credit method is the most appropriate for the Northwest. (Most other marginal cost methods have been developed by proponents of embedded cost of service methods, and tend to put marginal costing in an adverse light.) A total of about 40 different embedded cost of service methods have been developed, and all are economically inefficient and unfair to small power users. (See section of this appendix on marginal versus embedded cost of service studies.)

Baseline Methodology

Seattle City Light uses a methodology which cannot really be characterized as either "marginal" or "embedded." Each customer class must pay the cost of thermally-generated power for all use in excess of that class's load in 1978 (the baseline period). As a result, growth in one class requiring new power from expensive new power plants does not raise the rates of another class. Allocation of costs based on growth is very favorable to residential customers, since their load is not growing as fast as commercial or industrial loads.

Used by: Seattle City Light.

What Should Consumers Urge Utilities To Do?

In areas where rapid growth is occurring among commercial or industrial customers, Seattle's methodology should be considered. If utilities insist upon a more conventional cost of service method, the list above includes most of the options which they will consider.

If a local utility is willing to use the methodology approved by the Oregon PUC, residential and small business ratepayers will be treated fairly. If a utility insists on using an embedded cost approach, consumers will have to exert more influence on the ratesetting process to insure a fair deal for residential and small business customers, and to help promote conservation. The "Peak Credit" or "Average and Excess Demand" methods tend to be more fair to residential customers than either the "Peak Responsibility" or "Twelve Monthly Peak" methods.

The list below shows where some of the judgment calls in allocating costs are made, and how they could be made more fairly.

COST	HOW SOME EMBEDDED STUDIES ALLOCATE THESE COSTS	HOW THESE COSTS COULD BE ALLOCATED
GENERATION		
Fixed costs of power plants	Demand	Only peaking plants are demand related; baseload plants are energy related
Maintenance of power plants	Demand/energy	Costs do not vary with peak load; should be allocated to energy
TRANSMISSION		
	Demand	Only incremental cost of expanding system from average demand to meet peak load should be allocated to demand; basic costs should be allocated to energy.
DISTRIBUTION		
Overhead lines	40% demand/60% customer	40% demand/60% energy. Costs of lines vary with density of system and with weather, not with number of customers.
Underground lines		
Transformers	30% demand/70% customer	30% demand/70% energy. Basic transformer can serve many customers if close together; costs do not vary with number of customers.
Substations	Demand	30% demand/70% energy; most costs are independent of peak load; average use level should be allocated to energy, incremental cost of meeting peak is a capacity related cost.

MARGINAL COST OF SERVICE VS. EMBEDDED COST OF SERVICE STUDIES

Utilities use three general categories of cost of service studies. "Embedded" cost of service studies focus on recovering the cost of facilities already in place from the utility's present customers. "Marginal" cost of service studies evaluate utility costs based upon what it would cost to build new facilities today. "Baseline" cost of service studies start with a base period and a corresponding marginal or embedded cost allocation, and then assign the cost of new energy facilities to those classes with growing loads, so that the classes which do not grow do not have to pay the costs of new facilities they are not using.

The State of Oregon uses marginal cost of service methodologies to set its private utilities' rates. Many PUDs use embedded cost of service methods. The City of Seattle is currently using a baseline cost of service method.

In the past, the vast majority of costs incurred by utilities were for transmission and distribution facilities, and it was very cheap to build power generating facilities. In the past ten years, however, the cost of transmission and distribution facilities has approximately doubled, keeping up with the general rate of inflation. At the same time, the cost of power from new generating plants has quadrupled.

Embedded cost of service studies reflect the former economy, and tend to suggest that customers using large amounts of energy should still pay the low costs of old power generation facilities. Embedded cost studies also imply that customers like residential ratepayers, who use extensive distribution lines relative to the amount of power they consume should pay the largest portion of utility costs, because they must repay the costs of these transmission and distribution facilities.

Marginal cost of service studies recognize that new generating plants will be more expensive than in the past. The cost of generating plants has risen much more rapidly than the cost of distribution. Therefore, marginal cost of service studies suggest that customers who use large amounts of energy relative to their need for distribution lines should pay the largest portion of these costs.

Because of this practical difference many industrial customers (who use large amounts of energy) argue that embedded cost methods should be used, while organized residential and small business ratepayers advocate marginal cost methodology. Industrial customers claim that embedded cost studies measure the "actual" costs which utilities must pay for the

“actual” facilities they are already using. Consumer advocates argue that marginal cost studies more accurately measure the “actual” costs which utilities must pay to meet increasing or decreasing demands.

Embedded cost studies suggest that ratepayers should pay rates based on what utility facilities cost in the past. As a result, such studies suggest that rates should reflect low power generation costs and high distribution costs. These rates encourage massive use of electricity by giving discounts to large power users, and thereby forcing utilities to invest in expensive new generating facilities at new (marginal) costs.

Marginal cost of service studies, by evaluating all facilities as though they were new, show that costs of producing new power are higher than the rates needed by utilities to pay for a combination of new and old facilities. In order to use a marginal cost of service study to set retail electricity rates, rate-setters must somehow reconcile this discrepancy.

The State of Oregon, which uses a marginal cost of service methodology to regulate its private utilities, compensates by reducing marginal costs (as determined in their study) by a uniform percentage. The industrial customers pay a much larger percentage of the utility's total utility costs than they would under an embedded cost approach. Residential and small business ratepayers pay a smaller fraction of these costs. The total revenues are exactly the same as they would be under an embedded cost study.

Because distribution costs are reduced by a uniform percentage along with all other utility costs, the effective level of distribution costs becomes lower than in an embedded cost study. The level of power generation costs in rates becomes relatively higher. As a result, those using large amounts of power pay more, and those who conserve pay less when marginal cost of service studies are used.

Marginal cost of service methods are often opposed by industrial customers. These ratepayers often argue that restructuring rates to shift costs to them (and away from residential and small business customers) will drive up their cost of doing business, make them uncompetitive and depress the local economy. Since they have a vested interest in continuing the large quantity discount policies of the past, they usually favor the continued use of embedded cost of service methodologies, rather than forward-looking marginal cost studies.

Some utilities and consultants have developed what they call marginal cost methods which fail to achieve the purpose of a marginal cost study. While the method used by the State of Oregon looks to the least expensive new source of energy, and capacity, some methods do not.

CH2M Hill and Economic & Engineering Services (two cost of service study consultants) use the cost of a baseload power plant as the “marginal cost” of peakload capacity, even though alternatives (such as combustion turbines) would be the logical choice to minimize the costs of peaking capacity. These firms do not advocate the use of marginal cost methods. In developing a marginal cost approach they have chosen a method that no advocate of marginal cost-based pricing would defend, and then they proceed to demonstrate why it is inappropriate. Their approach condemns marginal cost of service methodology by distorting it.

Most industry arguments against marginal cost of service methodology center on the fact that marginal cost of service studies do not measure the “actual” costs that the utility must pay, but rather measure the cost of new facilities and then reduce them by a percentage to develop rates. As a result, they argue, customers are not required to pay the true costs of the facilities which they actually use.

Embedded cost of service advocates fail to see that their own studies don't measure realistic costs of power. Embedded cost studies look backward at costs incurred in the past, rather than forward to costs which will be incurred in the future. Obviously, decisions about how many power plants to build in the future will depend on how electricity is priced and used in the present.

Obviously, we cannot determine exactly how many power plants to build in the past based upon how electricity is priced presently. But through forward looking rate design, consumers can base their energy use decisions on the same future costs that utilities will face as they acquire expensive new facilities. This will help show utilities how many new plants will be needed. The utility cannot avoid past costs, but can avoid future expenses.

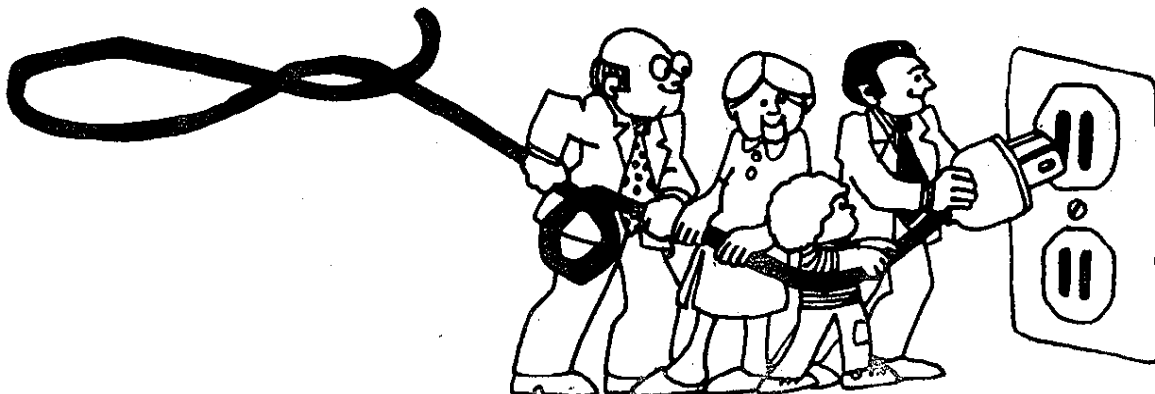
Embedded cost of service advocates claim that marginal cost of service methodologies involve inherent major policy judgments. This is true, because policy judgments are hidden in all cost of service studies, including embedded cost of service studies. These policy judgments can be made more sensibly, however, if consumers and utilities take advantage of the marginal cost of service method to help plan an energy future. The judgments inherent in an embedded cost study only lead us to try to repeat our energy history — an impossibility in today's world.

Industrial consumers often argue that marginal cost of service studies are hypothetical, but very little about these studies is hypothetical. New power plant costs are very real, and very, very high. New transformer prices, or powerline prices, are not hypothetical either.

In addition to providing a future — focused and realistically — based foundation for rates, use of marginal cost analysis improves, rather than detracts, from the revenue stability of a utility. Rates based on new resource costs will parallel current costs for increased electric service, so additional power sales will cover additional power costs. If rates are based on embedded costs, rates for additional power will reflect only the low average costs of existing facilities. Utilities will not be able to cover increased costs of new facilities from revenues so they will become less, not more, stable as a result of implementing rates based on embedded cost analysis.

The simple choice of a cost of service methodology, whether marginal or embedded, can't solve all of the questions which need to be addressed in setting rates. For example, some utilities have included the BPA wholesale power rate in doing marginal cost of service studies, rather than the cost of new facilities such as the WPPSS nuclear plants, as the marginal cost of new power supplies. However, since BPA wholesale power rates average the cost of expensive, new facilities with low cost hydroelectric power, they fail to reflect the costs BPA is facing to meet future power needs. Utilities must look beyond their own boundaries, and look at the total cost of their actions. The marginal cost of new facilities should measure exactly that: the cost of new coal or nuclear plants which utilities and BPA are building or considering.

Consumers can ask their utilities to use the marginal cost of service method employed by the State of Oregon. This method, called the “peak credit” method, is most fair to residential and small business customers. (See section of this technical appendix on cost of service methodologies.) By using forward-looking cost studies, utilities can provide consumers with objective information, insure that industrial customers pay their fair share of costs and help to bring down future power load growth, thus reducing future rate increases.



TECHNICAL APPENDIX: RATE DESIGN

COMMERCIAL/INDUSTRIAL RATE DESIGN

Large power users pay different rates for electricity than residential customers and small businesses. Utilities base these special rates on the particular way that different kinds of customers use electricity, and the costs of serving each particular use pattern. But special rates for large customers can affect the way that they use power, just as rates for residential customers do. Careless rate design can actually encourage commercial and industrial customers to waste power, but creative and thoughtful rate design can help encourage conservation and efficient use of a utility's resources.

When utilities assign the cost of providing service to different classes, they base the allocation on demand and energy use for each class. Energy charges are based on the total amount of energy a customer or customer class uses over the course of a year. Residential customers, for example, have low energy charges as a class, because they use relatively small amounts of power. Industrial customers, however, may use tremendous amounts of electricity for their production processes, and so they have high energy charges.

Demand or capacity charges are based not on the actual amount of power used, but on and the peakload, or maximum level, of power used by that class. A consumer such as a factory, which uses power at a steady rate all year long, has a high load factor, a low peak load, and a correspondingly low capacity charge. Residential consumers, however, who use substantially more power in cold winter months than during the rest of the year, have a low load factor, a high peak load, and correspondingly high capacity charges.

The amount of weight a utility gives each of these factors in determining the allocation of costs affects the rates for each customer class, depending on how that class uses energy. Cost allocations based primarily on capacity charges tend to favor large industrial customers, because these customers have high load factors.

Commercial and industrial electric customers are billed differently than residential customers by most utilities. While residential ratepayers pay a simple rate per kilowatt-hour, large power users are billed separately for "energy" and "demand." Large commercial and industrial customers use enough power to justify sophisticated metering, but residential customers typically do not.

Although residential and small business customers do not pay separate demand charges, the wholesale demand charge is often used in developing their retail rates. The demand charge is averaged in, at an estimated load factor, with the energy charge, to develop a uniform rate per kilowatt-hour. As a result, residential and small business customers do pay the demand charge in their retail bills; it just doesn't appear as a separate item.

How do demand charges affect commercial and industrial customers?

High demand charges encourage customers to maintain very high load factors, that is, to use power at a steady rate, rather than have their use vary over the day and year. This is valuable for utilities outside the Northwest, which use coal and nuclear power plants for most or all of their power needs, because it allows them to use these high cost plants efficiently by running them continuously.

On a hydro based system, which can meet peak loads more easily than a thermal system can, this problem is less important. But many Northwest utilities, including the BPA in its wholesale rates, continue to encourage high load factors, even though peak loads are not the most serious problem we face in the Northwest.

Utilities in other parts of the country have structured rates to emphasize the cost of meeting peak loads, through high demand charges. In the Northwest, however, we meet our peak loads not with expensive coal or nuclear power plants, but with hydropower. Peak load power is less expensive here than in other parts of the country.

An example of this difference in regional conditions is the installation of multiple powerhouses on many of the Columbia River dams, compared with the use of coal and oil fired plants to meet peak loads in other parts of the

country. If we used our dams all the time to meet base loads, the reservoirs behind them would be emptied, and we wouldn't have enough water to meet peak or baseload needs by the end of the year. But utilities outside the Northwest can operate thermal peaking plants continuously, as long as customers are willing to pay for expensive fuel.

The Northwest can use existing plants to meet peak demands, or can purchase power for the winter peak from California over the North-South intertie. Either of these options will meet peak demand at much lower cost than building a baseload coal or nuclear plant to meet such demand, which is what a utility outside the Northwest might have to do.

Northwest utilities can and should use cost of service methodologies to account for these different available alternatives when allocating costs between demand and energy. "Peak credit" methodologies based on both marginal costs and embedded costs of peak power facilities, help energy planners allocate costs between classes. Unfortunately, BPA and the region's public utilities are still using outdated cost of service methods, appropriate only for other parts of the country. (See technical appendix to this manual on cost of service issues.)

Why shouldn't rates be based on demand charges?

When rates are based on a large demand charge, residential and small business customers pay higher overall rates than they would otherwise. BPA presently has wholesale demand charges higher than the retail demand charges of most of the region's private utilities which produce their own power.

Utilities which base their rates on BPA's unfair rates overcharge customers with relatively low load factors (residential and small business customers). These small power users end up subsidizing large industrial customers. Ratepayer groups can ask their local utilities to urge reforms to BPA's wholesale rate structure along the lines of the approach used by the private utilities to will save residential and small business ratepayers significant amounts of money.

Industrial customers, however, often promote cost allocations based mainly on demand charges, rather than on energy charges, since they obtain the lowest rates in this manner. Smaller municipals and PUDs, and the BPA, have accepted industrial arguments in favor of these rates.

A high load factor industrial customer is not, in fact, a less expensive customer for utilities to serve. These customers are on the system all of the time — including when the system must meet peak demand. Because they are on the system at the time of the peak, they are part of the load which forces the utility to build peaking facilities. On the other hand, a consumer such as an irrigating farmer, who doesn't demand power at the time of the peak load, but who uses energy at other times, such as the summer growing season, alleviates some of the pressure on the utility, and thus allows the utility to minimize its total costs.

To manage peakload demand and its costs, rates should vary by season and by time of day. A rate which provides all power on a per-kilowatt-hour basis, differentiated by season and by time of day, provides the proper incentive for customers to remain off the system at the time and season of the system peak. This change would eliminate any justification whatsoever for rates to be further divided into demand and energy components. (See section of this technical appendix on time of day and seasonal rates.)

The sum of all loads at the time of the peak, not the individual peaks which occur throughout the day and year, determines system peak capacity. Rates should be set to increase whenever the system approaches a predicted peak situation, so that customers can respond to peak conditions by cutting back consumption. A reduced off-peak rate would reward industrial customers who adjust their production schedules to use power at off-peak times.

Demand charges do not encourage consumers to reduce peak-time consumption, even though they are measured against peak load, simply because they are measured only against the individual peak, not the system peak. Demand charges don't address the whole system's needs over time.

Rates differentiated by season and by time of day will help minimize the COINCIDENT PEAK, on which capacity investment decisions are based. The present system of demand charges only helps to minimize the NON-COINCIDENT PEAK load, which does not strain the system to begin with.

A high demand charge simply encourages consumers to make a special effort to control their individual peak demand. It doesn't keep them from using power at the peak — in fact it encourages them to continue using power at a continuous level during the peak, to avoid the high demand charge.

How can the Northwest correct this false price signal?

All utilities and BPA could revise rates to inform customers of the need to conserve energy, particularly in winter. For effective peakload management, utilities should eliminate demand charges, and instead use rates differentiated by season and time of day. (See section of this appendix on seasonal, time of day, and interruptible rates.)

Progressive rate design suggests that demand charges should be kept low, or eliminated, except for periods when peak loads are a problem. Utilities will then have to use higher energy charges, which will encourage energy conservation without increasing the total amount of revenue required from customers. Industrial customers would pick up a larger share of the total, until they learned to conserve peakload energy. Residential and commercial customers would pay their fair share of peakload costs, too, without any unfair subsidy of high load factor industry.

How else can we reform commercial and industrial rates?

Some utilities still have "declining block" commercial and industrial rates, under which rates decrease as consumption increases. These were justified when new power plants cost less than existing projects, but no longer make economic sense now that new resources are prohibitively expensive. Any utility which still offers declining block rates should eliminate them as soon as possible. In October, 1982, when BPA increases wholesale rates to the utilities, most retail rates will be revised, and any remaining declining block rates should be eliminated then.

Can utilities establish baseline rates for industrial and commercial customers?

Commercial and industrial rates cannot simply be inverted the way that residential rates generally are (See section of this manual on baseline and lifeline rates), because commercial and industrial customers have all kinds of different needs for power. It would be impossible to set a uniform "essential needs" level for these customers. A small corner grocery will use much less energy than a supermarket, but, even with aggressive conservation measures, the essential needs of the large store will always be greater than the small store. An industry employing 50 people, even if it uses hopelessly wasteful production technology, will still use less power than Boeing, no matter how efficiently Boeing builds airplanes.

Commercial and industrial customers can, however, be allocated their fair share of the low cost hydroelectric power at low cost, just as residential customers are through a baseline rate. The incentives to conserve will be just as strong for commercial and industrial customers as for residential customers under an inverted rate.

A utility could base the share of low-cost hydropower for each commercial and industrial customer on the number of people it employs. Relatively non-energy intensive industries in the U.S. consume about 600 kilowatt-hours per month per employee. Energy-intensive industries, or industries which use their power inefficiently, should be asked to pay for the more expensive power produced at new facilities, through the higher rate for more power than 600 kilowatt-hours per employee per month.

Another way to provide industrial customers with the equivalent of a residential baseline rates was developed by a Canadian utility, and was later implemented for natural gas prices in Wisconsin. It is called "benchmark pricing," or the "Large User Pricing Rule."

Utilities could provide each commercial and industrial customer with a share of low cost power equal to a fixed percentage of their past usage. Because the allocation would not change as power use changed, any expansion in energy use would be charged at the price of power from new plants. With such an approach, customers who have increasing loads pay the actual costs of the new facilities which are being built to meet growing loads, and customers whose loads are stable do not have to subsidize these costs.

A variation of this approach is to give each customer an allocation of power equal to their usage three years ago at a low rate reflecting the cost of older resources. Any increase above that level would be billed at a new-re-

sources rate. Further, any reductions in energy use below that level would be rebated at the same new resources rate. As a result, any commercial or industrial customer who cut back power use, either through conservation or business reduction, would receive a sharply reduced bill.

This would provide a strong new incentive for conservation, which is important, because most businesses demand a very rapid return on their conservation investments. (see section of this manual on why utilities should invest in conservation.) A rebate based on high new resource cost, rather than low average costs, will effectively repay these investments very quickly.

Customers who make the conservation investments keep the benefit of those investments themselves. The present average-cost pricing forces them to share the savings with all other customers, since all customers' rates go up to pay for new power plants, and all customers' rates are held down by any customer's decision to conserve.

Under the current system, industrial customers who invest in conservation reduce their power bill only by the average cost of power, not by the cost of the new power resources which their decision helps the utility avoid. As a result, few conservation measures are implemented, and everyone's rates increase to pay for the new resources. Benchmark pricing can make conservation more appealing to industry, just as baseline and lifeline rates do to residential customers.

Benchmark pricing could also help industrial customers to stabilize their profits during business cycles. During recessions, industrial production and power use is low, and a rebate at new resources cost for using less power would help them to keep costs very low also.

During an economic boom when their power use is back up they would have to pay much higher rates. The requirement would come when business is healthy, and profits are high, so the burden would not be onerous. This is not an intended feature of the large user pricing rule, but it tends to make this innovative approach, designed primarily to promote long-term conservation, attractive to industrial customers.

What progressive commercial and industrial rates are already in use?

The reduction or elimination of demand charges during off-peak months, with compensating higher rates for energy and for on-peak usage, encourages energy conservation during all months, as well as conservation of peaking capacity during peaking periods. Seattle City Light has already implemented this concept; the private utilities in Washington and Oregon have accomplished nearly the same thing by structuring their rates with very low demand charges, and with seasonal increases during the winter. BPA has eliminated its demand charges during evening hours, to reflect the fact that peak loads are not a problem during that period.

BPA sells wholesale power at different rates depending on the season and time of day. If your local utility buys its power from BPA, and does not have rates which, like BPA's, are higher during the day and during the winter than at night or in spring, its rates don't accurately reflect BPA's wholesale rates. Such a utility actually forces businesses which use lower cost power to subsidize those which use higher cost power.

Many utilities offer interruptible rates, under which the customer agrees to give up service in case of shortage in exchange for a lower rate, and time of day rates for larger customers. Wholesale power prices from BPA, and production costs for utilities which generate their own power, are higher during peak periods. Utilities use interruptible rates to reduce peak loads directly, and use time of day rates to reflect the varying costs of power production and thus to encourage customers to limit peak-time use. (See section of this manual on Interruptible and Time of Day rates.)

Puget Power, for example, has a "voluntary peak curtailment program," which allows customers a large rebate for voluntarily reducing their load during the coldest times of the year, when peaking facilities are straining to meet demand. The rebate is appropriately based on the cost of using oil-fired power to meet peak loads, since that source of power would be used in the region during those coldest times, when all of the less expensive alternatives have been exhausted.

Summary

Utilities can restructure commercial and industrial rates to promote energy conservation, to minimize the cost of power over the long run to all customers, and to provide proper economic rewards to customers who take actions to benefit the overall regional energy picture. Power producers and consumers can pursue these opportunities to improve the efficiency of energy use.

TIME OF DAY, SEASONAL AND INTERRUPTIBLE RATES

In the Northwest, electricity is more expensive to produce in the winter than in the summer. Our store of water power is built up in the rainy winter months, and only becomes useful and plentiful after the spring melt. Every year, we face a temporary shortage during the cold months, when consumers need more power to heat their homes and when the dams have less power to offer us. We also face temporary shortages every day, at certain times when many power users demand most of their power and stretch the system to its limits. Special rate structures can help the Northwest manage these temporary shortages. Time of day rates, seasonal rates, and interruptible rates can help the Northwest conserve its valuable resources by reflecting the true costs of temporarily scarce power.

Time Of Day Rates

Time of day rates vary according to the cost of providing electricity at various times of the day. Under time of day rates, customers pay more for power they use in the morning and evening than for power they use at times when the utility can rely on its less expensive power sources to meet everyone's needs.

Most utilities face the greatest demand for electricity in the morning and evening when residents turn on their heat, lights and appliances. Utilities outside the Northwest use limited and expensive oil or gas turbines to meet this peak in electricity demand.

In the Northwest, however, utilities do not often face high costs for peak-demand energy, because they simply construct extra turbines on existing hydroelectric dams instead of building oil or gas-fired generators. Northwest utilities use more expensive facilities such as coal and nuclear plants to serve the region's relatively unchanging base energy needs (the baseload) because if they operated the additional hydro turbines all or most of the year, they would quickly drain the water behind the dam.

So, although peak power from hydro plants is inexpensive, it is too scarce a resource for use in meeting normal electricity demands. If we use hydro for peakload demand, we must build thermal plants to meet baseload needs. Time of day rates, therefore, should not encourage additional use of energy off-peak, but should discourage use of electricity during the short periods when the limits of the hydro system are reached.

The off-peak portion of the time of day rates should include all the costs of providing customers with electricity (generation, transmission, service, etc.) except for the costs of peak-load facilities. Customers using power during the peaks of the day should pay a surcharge to cover the costs of the extra hydro turbines. Then people will use less power in high-demand times because it will be more expensive, and so will conserve the region's energy and money.

Time-differentiated rates may only make sense for customers who use a lot of power. For residential and small business customers, the additional expense of special meters for these rates may not make economic sense. Low-volume customers could, however, take advantage of seasonal rates.

Seasonal Rates

Seasonal rates can help the Northwest conserve electricity much more

effectively than time of day rates do, because Northwest power use and cost varies much more with the time of year than with the time of day. Seasonal rates are based on the different costs of providing electricity in summer and winter.

In the Northwest, people consume the most electricity in the winter, when they need more heat and light. This peak demand for electricity comes at the time when there is little water behind hydroelectric dams, because most water is still frozen in the mountains. As a result, Northwest utilities must buy power from outside the region or construct expensive coal or nuclear plants, or fossil fuel turbines to meet the area's high winter demand. Seasonal rates should be highest, then, when demand for electricity and the costs of providing it are greatest.

Under seasonal rates, customers begin to see the very high real costs of electric heat. Higher winter rates will encourage electric heat customers to conserve, and will hold down power rates for all customers over the long run.

Utilities must be careful to keep the rates for low-demand seasons high enough to discourage the wasteful use of new electricity. Any increase in summer usage will draw down hydro supplies, reducing the amount of low-cost power than can be generated during the peak winter season. Off-summer rates must be high enough to cover the costs of producing power and to encourage consumers to continue conserving all year round.

Interruptible Rates

Utilities charge interruptible rates to their customers who allow the utility to turn off their electricity during power shortages. The utilities can avoid buying power from outside the region or constructing costly generating plants by diverting energy from these customers to those who need continuous service.

Like time of day and seasonal rates, interruptible rates should account for the actual costs of generating power.

Traditionally, interruptible rates have been unrealistically low. Customers pay much less than they should, considering how few interruptions they really face. Though utilities avoid having to find other power under this system, the low rates new energy customers onto the system and encourage greater energy consumption.

Instead of offering a discounted rate for all power consumed, utilities should pay interruptible customers about 5 cents per kilowatt hour (the difference between average rates at 3 cents per kilowatt hour and the price of oil generated peak power from California at 8 cents per kilowatt hour) for the power they would have used if their service hadn't been temporarily shut off. This system would encourage interruptible customers to conserve energy, because they would pay the full high price of all power they actually used. And it would compensate them for the inconvenience whenever the utility had to divert their power supply to other customers.

Interruptible rates encourage firms to allow utilities to interrupt their power, reducing the utilities' need to build new sources of power to meet peak demand. If used properly, these rate structures help insure an adequate supply of power at low cost.

LOW-DENSITY DISCOUNTS

Residential electricity consumers in rural areas often have to pay the high cost of distributing power over rugged terrain in sparsely populated areas. This high cost is an unfair hardship on many residents of rural communities, and so Congress, in the Northwest Power Act of 1980, authorized the Bonneville Power Administration (BPA) to offer a discount to utilities who serve these rural customers. BPA has set up a program granting discounts of 3, 5, or 7% to rural utilities. (The size of the discount depends on the density, or number of customers per mile of distribution powerlines, of the utility.)

Unfortunately, this "low density discount" program, administered by the BPA, allows large power users, such as heavy industries, to reap the benefits of these regionally financed discounts. The small residential customers for whom the discount is intended continue to pay inordinately high electricity prices. In this summer's wholesale rate increase hearings, the BPA will propose to extend the existing program.

The current program has two basic problems. First, BPA offers this discount to each utility in the form of a reduced rate per kilowatt-hour of electricity, even though many utilities include the costs of distributing power in

their monthly service charge, NOT in their energy charge per kilowatt-hour. If the rural utilities pass this discount on to their customers as cheaper energy rates instead of cheaper monthly service charges, major energy consumers such as heavy industries, who use the most kilowatt-hours, get the largest discount. Small energy users such as residential customers and small farms receive almost no benefit. The discount on energy used encourages increased energy consumption in a time when the region faces high costs for additional power sources, and so the discount program thwarts the main purpose of the Power Act: energy conservation.

Second, BPA does not take into account the number of large power users served by each utility when it figures out which electric companies qualify for the discount. Under BPA's formula, utilities with sparse populations and a few major industrial customers qualify for the largest discounts, because they serve a small number of large power users spread over a wide area. They get a good break through the BPA program, because they qualify for the high discount rate (because they serve few customers) and they get a large dollar discount (because their few customers use a lot of power) have

the largest sales per customer.

These utilities actually heed the discount the least. Because their large consumption customers use so much power, they can spread the costs of distribution over many kilowatt-hours of power sales. Each large customer needs only one power line, so these utilities have relatively low distribution costs per kilowatt-hour. Utilities which have to lay out many small lines for residential and commercial customers have higher costs, but do not receive as large a discount.

These two problems compound each other, resulting in big discounts for large industries, incentives for more electricity consumption, and little or no reduction in the distribution charges paid by small rural customers of most of the low-density utilities. In other words, BPA's low-density discount program not only fails to achieve its intent, it also obstructs the energy conservation intent of the Power Act. But this situation can be cured. The BPA program, with only minor changes, could promote energy conservation and reduce high distribution charges.

First, BPA could require its customer utilities to pass on the discount as a reduced monthly service charge rather than a reduced rate per kilowatt-hour. Every electric company that buys power from BPA must have its rate schedule reviewed by BPA, and BPA could use this "rate oversight authority" to direct the way that utilities handle the discount. This provision would offset high distribution costs without rewarding energy over-consumption, because the rate per kilowatt-hour would remain undistorted.

Second, BPA could provide a set dollar amount of discount per customer instead of a reduced rate per kilowatt-hour as it now does. Since this discount would remain independent of the amount of power consumed, it would insure that customers would not receive a reward, in the form of a larger discount, when they increase their energy consumption.

Such a uniform discount could take many different forms. BPA could base its discount on the same categories that it uses now — the 3, 5, and 7 percent categories — simply changing them to 3, 5, and 7 dollar per month discounts to each retail customer. This approach recognizes the fact that different utilities have different levels of "low-densityness."

BPA could alternatively offer a dollar discount based on the actual local distribution costs per customer — a calculation which BPA could make very easily, and which would insure that the customers who face the highest distribution costs in their bills would receive the largest discounts.

All of these alternatives combat the real costs associated with low-density distribution, without rewarding large and increased power consumption. They would ease the financial burden on the rural consumers spread out over eastern Washington and Oregon, and Idaho, for whom the discount was originally created.

Washington Utilities Which Qualify For The BPA Low-Density Discount

Alder Mutual Light Cooperative
Benton Rural Electric Cooperative
Big Bend Electric Cooperative
Columbia Basin Cooperative
Columbia Rural Electric Cooperative
Elmhurst Mutual Power and Light Cooperative
Ferry County PUD #1
Grant County PUD #2
Inland Power and Light Cooperative
Kittitas County PUD #1
Klickitat County PUD #1
Lincoln Electric Cooperative of Washington
Nespelem Valley Cooperative
Ohof Mutual Light Cooperative
Okanogan Electric Cooperative
Orcas Power and Light Cooperative
Skamania County PUD #1
Tanner Electric Cooperative
Wahkiakum County PUD #1

LINE EXTENSION CHARGES

New power lines cost money, even if they only extend from the power pole on your street to your house. Someone has to pay this cost, so many utilities charge it to the owner of the new building that uses the line. This "line extension charge," applied to offset the cost of extending the line, helps to hold down power rates for customers who already receive electric service, including low income and senior customers who seldom live in new buildings. But ratepayers must be on the alert to be sure that the utility handles these charges fairly.

When a utility receives revenues from a line extension charge, it should reduce the investment in distribution facilities (transmission lines, transformers, and poles) shown in its books. Some utilities treat line extension charge payments as general revenues, rather than as "contributions in aid of construction." If your utility accounts for line extension payments as general revenues, when it does its cost of service study residential customers may be billed again for costs already paid when the lines were extended. Line extension charges should be handled as special revenues for the con-

struction of the extended line. (See the technical appendix to this manual on cost of service issues.)

Some utilities allow new customers onto the system without extra charge, even when lines must be extended a long distance.

Some of these utilities then require their customers to pay for a minimum monthly amount of power, as a way of recovering the line extension costs. This approach encourages the wasteful use of energy. If you receive a minimum bill equal to the charge for 2000 kilowatt hours per month, for instance, you have no reason to try to use less.

Utilities should account for the costs of extending lines separately from the cost of electricity per kilowatt-hour. Encouraging the consumption of energy eventually increases rates for all customers, as new coal and nuclear plants must be built to meet increasing demand. Utilities should cover line extension costs by charging a one-time fee, and not through a minimum monthly bill.

NEW HOOKUP CHARGES

Whenever someone builds a new electrically-heated home, office building or factory, electric utilities must find additional power to meet its heating needs. By the year 2000, 75% of all residences in the Northwest will probably have electric heat, if present trends continue, although electricity is one of the least energy-efficient sources of heat available. Power to heat new buildings now comes from very expensive new power plants, and drives up electric rates. As a result, existing customers pay much higher rates to subsidize the energy use of new customers.

How can utilities help to change this pattern?

Utilities can discourage installation of electric heating systems in under-insulated homes by reforming rate structures (see section of this manual on baseline/lifetime rates.) Inverted rates are a significant improvement over the rate structures many public utilities use now, and these rates tend to promote efficient use of electricity. However, they still do not fully solve the problem of new electric heat hookups.

A required charge for hooking up a new electric heating system would correct the economic illusion that an underinsulated house with electric baseboard heat is less expensive than a well-insulated house with a gas furnace, heat pump, or some other alternative with a higher installation cost. The person considering electric heat would have to face part of the cost of a new power plant when figuring out the cost of a new home.

Currently, the home builder or buyer can save money by relying on baseboard heating, because every ratepayer shares the cost of the new power plant. A new service hookup charge for electric heat prevents the individual energy investment decision-maker from shifting some of the costs of electric heat to other people, and helps consumers realize that alternative heat sources can be more cost-effective than electricity. This will lead to more rational decisions about which energy source to use, which will in turn reduce the number of new electric heating hookups and the number of expensive new power plants needed.

Most studies of the appropriate hookup charge for new homes suggest that a fee of \$200 per kilowatt of connected load will cover the difference between the cost of building the facilities needed to serve the load and the amount that these new customers will pay in their monthly bills.

Why haven't utilities already instituted hookup charges?

Before 1970, new power plants were relatively inexpensive, and new customers paid rates that fully covered the cost of building and operating them. At that time, there was no need to use hookup charges to discourage new customers from choosing electric heat. Today, although new power plants are prohibitively expensive and although the use of electric heat drives up everyone's rates, utility companies have a different set of reasons not to use hookup charges.

Utilities and regulatory agencies often claim that hookup charges are not fair to their customers who live in areas where natural gas is not available. However, this argument assumes that no other alternatives exist, although many alternatives to gas and electric baseboard heat ARE available (not the least of which is conservation). This is equally true for all service areas, regardless of natural gas availability.

Homebuyers and builders do not expect their neighbors to pay for the lumber or hardware for their new homes, even though prices have risen sharply in the last 20 years. There is no reason for them to expect their neighbors to pay for the portion of their heating equipment which is located at the utility plant's site, either.

Utilities also argue that a hookup charge discriminates between old and new customers. However, the fact that new electric heating customers have to pay a charge that old customers did not have to pay is no more discriminatory than the fact that existing customers must pay rate increases to

subsidize electric service for new homes. Since the price new and old customers pay for their electricity is the same, there is no price discrimination.

What will the utility do with the money it collects in hookup charges?

The new hookup charge must be used to purchase the cheapest source of new energy available to the utility — probably conserved energy, for the foreseeable future. The charge should go into a separate conservation fund which the utility can use to pay households and businesses for conservation measures, in order to provide the energy new customers need as cheaply as possible.

To ease the impact that such a charge would have on low income families, a portion of the fund should go to help these families to conserve energy. Some of the conservation fund can pay the difference between low-initial-cost electric heating systems and more expensive, energy-efficient systems for low income households, or can fund the weatherization of poorly insulated low income homes.

The fund should also be used to help finance space and water heating conversion from electricity to alternative energy sources. This would reward consumers who free up electricity for other uses by converting to alternative heating systems.

Finally, using the funds from a new electric heating hookup charge for conservation measures could qualify the utility for billing credits from the Bonneville Power Administration (BPA). (See section of this manual on billing credits.) The BPA can reward its customers for conserving energy by paying them the amount that BPA saves through utility conservation measures. In this way, a charge on new electric space and water heating hookups would encourage energy conservation, the first priority of the Northwest Power Act.



GLOSSARY OF ELECTRIC UTILITY TERMS

ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION (AFUDC) — The interest on money borrowed for building major energy projects, charged to ratepayers once the projects are in service. (See CONSTRUCTION WORK IN PROGRESS.)

AMORTIZATION — The repayment over time of a part of a utility's equipment, including the interest on money borrowed for construction. A mortgage on a house allows the homeowner to amortize the cost of his or her home over many years.

AVOIDED COST — The cost of power from the next power plant a utility would have to build to meet growing demand. This cost would be "avoided" if a conservation or renewable energy project were substituted for that next power plant.

BASELINE RATE — A rate which allows all customers to buy a set allowance of energy at lower rates than additional energy. (See LIFELINE RATES.)

BASE LOAD — The minimum amount of power which a utility expects to have to provide continuously to its customers.

BASE LOAD PLANTS — Power generating plants, such as nuclear and coal plants, which are used to meet the base load requirements of a power system.

CAPACITY OR CAPABILITY — The maximum amount of power a generating unit, generating station or other electrical apparatus can provide safely. The capacity of a system must be enough to serve the demand on that system. (See DEMAND.)

CAPITALIZED COSTS — Utility expenses, such as investment in a power plant, expected to provide benefits for more than one year. These costs are included in the rate base and charged to customers over a number of years, unlike operation and maintenance expenses, which are charged on a yearly basis.

COGENERATION — A method of recovering excess or "waste" energy created by various kinds of industries. Utilities and their customers can use the energy otherwise lost through the industrial process. For example, the waste heat produced by a large machine can heat an industrial company's offices.

COINCIDENT PEAK — The point in time when energy use reaches a maximum — a peak — for a utility's total system. This is the largest load a utility expects to serve. (See NON-COINCIDENT PEAK.)

CONSTRUCTION WORK IN PROGRESS (CWIP) — Charges included in current rates to cover the cost of borrowing money for major energy projects still being built.

COOPERATIVE — A utility owned and operated by a group of individuals who share the costs of maintaining it. Cooperatives (or coops) are not regulated by the Utilities and Transportation Commission.

COST OF SERVICE STUDY — An analysis of the cost of providing electrical service for a particular group of customers. The study helps regulators decide how much those custo-

mers should pay for service. Because each party presenting a cost of service study works from its own perspective, the inherent bias in the study can affect decisions in a way that discriminates against other customer classes.

CUSTOMER CHARGE — A flat fee customers pay no matter how much energy they consume. Also called a Monthly Service Charge.

CUSTOMER CLASS — Utility customers are identified with a group or class that has several characteristics in common. Examples of typical customer classes include: a) residential; b) irrigation; c) commercial; and d) industrial.

DEBT — The investment in a utility supplied by bonds, preferred stock or contracts such as mortgages, all with fixed interest amounts. (See EQUITY.)

DECLINING BLOCK RATES — Electricity rates which decrease in price per unit as more energy is consumed. An electricity customer pays, for example, 3 cents a kilowatt hour for the first 500 kilowatt hours used, then 2 ½ cents per kilowatt hour for the next 500 kilowatt hours used and so on. (See FLAT RATES, INVESTED BLOCK RATES.)

DEMAND — The amount of energy required by a utility's customers at a given time. The system's capacity must be large enough to serve the demand. (See CAPACITY.)

DEPRECIATION — The loss of monetary value of such assets as buildings and transmission lines, due to age and wear and tear. Ratepayers pay for this depreciation in value as it is considered one of the utility's operating costs.

ECONOMETRICS — A method of analyzing the complex relationships between many elements of an economy in order to predict economic trends. An econometric forecast could predict energy demand based on estimates of population, income and oil, gas and electricity prices.

ELASTICITY — In economics, a measure of the ability of consumers to respond to changes in prices. Elasticity compares the percentage decrease in consumption to the percentage increase in price.

EMBEDDED COSTS — The costs of a company's existing financial obligations, which cannot be avoided. They include the costs of debts previously incurred and the costs of operating and maintaining existing facilities. An example of an embedded cost is a 30-year bond obligating the company to pay a bondholder a certain amount each year.

ENERGY — The capacity to do work, such as lighting a room or running a motor. Electrical energy is measured in kilowatt-hours.

EQUITY — The utility investment supplied by the sale of common stock, or in the case of cooperatives, by member investment. Equity does not carry a guaranteed rate of return; common stockholders receive a dividend based on the profit of the company and not on a set percentage of interest. (See DEBT.)

FIRM POWER — Electricity delivered on a non-interruptible, always-available basis. A utility must supply its firm power

customers whenever they demand it, even if the system is short of power. (See INTERRUPTIBLE SERVICE.)

FLAT RATES — Electricity rates which charge the same price per unit for all energy consumed. (See DECLINING BLOCK RATES, INVERTED BLOCK RATES.)

INCREMENTAL COSTS — The additional amounts of money it takes to generate or transmit extra energy beyond a given base level of energy production. For example, a growing community might decide it needs a small windmill to supplement the dam that now provides its power; the cost per kilowatt-hour generated by the windmill is the incremental cost.

INCREMENTAL PRICING — A method of charging customers for energy consumption based on the incremental costs of energy production. (See INCREMENTAL COSTS, BASELINE RATES.)

INTERRUPTIBLE SERVICE — A contract for electric power which allows the utility to restrict or shut off service in case of shortage or other emergency. Interruptible service, available mainly to large industries, is usually cheaper than non-interruptible (firm) power. (See FIRM POWER.)

INTERVENOR — An individual, group or institution officially involved in a rate case. Intervenors have the right to be represented by attorneys, to cross-examine witnesses and to present testimony and witnesses of their own, and they receive all official mailings connected with the case.

INVERTED BLOCK RATES — Electricity rates which increase in price per unit as more energy is consumed. For example, the electricity customer pays 2 cents per kilowatt hour for the first 500 kilowatt hours used, then 2 ½ cents per kilowatt hour for the next 500 kilowatt hours used and so on. (See FLAT RATES, DECLINING BLOCK RATES.)

INVESTOR-OWNED UTILITY — A private power company is owned by and is responsible to its shareholders, unlike a government-owned or cooperative utility. Private utilities are regulated in each state by public service commissions such as the Washington Utilities and Transportation Commission. (See PUBLIC UTILITY DISTRICT, COOPERATIVE, MUNICIPAL SYSTEM.)

KILOWATT-HOUR — 1000 watts of energy consumption for one hour. The amount of energy produced by one acre-foot of water falling one foot. A kilowatt-hour could be used to light a 100-Watt bulb for ten hours.

LIFELINE RATES — A lower rate charged for a monthly allowance of energy for essential needs. Customers then pay higher rates for any additional energy they consume. Sometimes this rate is only offered to special groups, such as low income and elderly ratepayers.

LOAD — The amount of power used by a utility's customers at a given point in time.

LOAD FACTOR — The ratio of the average load over a period of time (usually a year) to the peak load in that period. (See PEAK LOAD.)

LOAD SHAPE (LOAD PATTERN) — The characteristic variation in the size of the power load over the course of a day, week or year.

MARGINAL COSTS — The change in total costs resulting from a change in the number of customers a utility serves (marginal customer cost), or a change in the size of the peak load (marginal demand cost), or a change in the total

amount of power sold (marginal energy cost). Marginal cost also refers the cost of power from new facilities, such as coal and nuclear plants. (See PEAK LOAD, DEMAND, AVOIDED COST.)

MONTHLY SERVICE CHARGE — See CUSTOMER CHARGE.

MUNICIPAL SYSTEM — A city-owned and -operated utility, which may provide water, electricity, sewer or gas service. In Washington, municipal systems are not regulated by the Utilities and Transportation Commission.

NON-COINCIDENT PEAK — The point in time when one customer or customer class reaches its maximum rate of use. That peak may or may not coincide with the peak for the total system. (See COINCIDENT PEAK.)

OPERATING COSTS — The expenses of maintaining day-to-day utility functions. They include operation and maintenance expenses, taxes, depreciation and amortization costs. They do not include interest payments or dividends to stockholders.

OVERALL RATE OR RETURN — The fixed rate of return in the bondholder's contracts plus the regulatory agency's judgment of what a fair market return to the shareholders' investment, in the case of private utilities, should be. The overall rate of return represents the cost of financing a total utility system, and is determined by the utility's rate base. (See RATE BASE.)

PEAK LOAD — The maximum total demand on a given utility's system during a given period.

PLANT IN SERVICE — The land, facilities and equipment used to generate and transmit power.

PUBLIC SERVICE COMMISSION — A state regulatory agency with authority over private utilities, such as the Washington Utilities and Transportation Commission and the Oregon Public Utility Commissioner.

PUBLIC UTILITY DISTRICT (PUD) — A publicly owned energy producer or distributor. Normally, PUDs serve areas larger than a single town or city, and they operate as special government districts. The districts are under the authority of elected commissions, rather than of the state utility regulatory authority. (See COOPERATIVE, INVESTOR-OWNED UTILITY.)

P.U.R.P.A. — The Public Utilities Regulatory Policies Act of 1978 (P.L. 95-617; 16 U.S.C. 2601 *et seq.*) requires utilities to consider rate changes to promote conservation, to provide information and intervention rights to consumers and to purchase power from small, privately owned power plants.

RATE BASE — The total cost of equipment needed to provide utility service. Such items as a utility's physical plant, facilities and equipment plus the amount of cash needed to operate are initially paid for by a utility's investors. The utility repays its investors with the money it collects through customer rates. (See RATE OF RETURN.)

RETROFIT — Modifications of an existing building. A conservation retrofit of a house might include installing insulation and storm windows; a solar retrofit might involve building water heating panels.

RETURN ON EQUITY — The allowance in rate-setting for private utility shareholders' earnings. A regulatory agency grants this allowance based on its judgment of what a fair market return to the shareholders' investment should be.

RETURN ON INVESTMENT — (See OVERALL RATE OF RETURN, RETURN ON EQUITY.)

SEASONAL RATES — Rates which are higher for energy used during high or "peak" use months. In the Northwest, seasonal rates are higher in winter, because more energy is demanded for heat in cold weather and because hydropower is scarce during winter months. (See PEAK LOAD.)

SURPLUS POWER — Electricity already produced but not immediately needed by the producing system.

TAIL BLOCK RATES — The last portion of energy in any series of block rates. (See DECLINING BLOCK RATES, BASELINE RATES.)

TARIFF — A listing of the rates charged by a utility.

THERMAL PLANTS — Power plants which burn fuel, such as oil, gas, coal or uranium to produce electricity with a

steam-powered generator.

TIME OF DAY RATES — Under time of day rates, energy costs more during high or "peak" use hours, because production and distribution costs are higher. (See PEAK LOAD.)

TOTAL SYSTEM — All of the power a utility can produce, including power the utility generates itself as well as power available through contracts with other utility systems, such as the Bonneville Power Administration. Total system may also refer to all of the customers who may demand power from the utility.

WATT — The electrical unit used to measure power, the rate of doing work.

KILOWATT — Equal to 1,000 Watts. (See KILOWATT-HOUR)

MEGAWATT — Equal to 1,000 kilowatts.

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