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(9)

# HOUSE COMMITTEE REPORT

7/2/87

Finance

Date referred:

FURTHER REFERRALS:

DATE: 4-20-88

Resources

HB 239

The \_\_\_\_\_ Committee has considered \_\_\_\_\_

"An Act making special appropriations to the Alaska Power Authority for payment as grants to certain public utilities for preparing certain end-use studies, load management reports, and advance resource plans and to the Alaska Public Utilities Commission for certain costs; and providing for an effective date."

**RECOMMENDS:**

- replace with CS HB 239 (Res)  the same title
- attached amendment(s)  a new title
- do pass
- do not pass
- no recommendation
- individual recommendations
- additional referral to the \_\_\_\_\_ Committee

**ADOPTS:**  \_\_\_\_\_ letter of intent

**ATTACHES NEW FISCAL NOTE(s):**

- fiscal impact  same as previous fiscal note published \_\_\_\_\_
- zero fiscal note  same as previous zero fiscal note published \_\_\_\_\_
- zero with analysis

**SIGNING DO PASS:**

Jim Galt  
Heinrich Spruiger  
Cliff Davidson  
[Signature]  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
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 \_\_\_\_\_  
 \_\_\_\_\_

**SIGNING OTHER RECOMMENDATIONS:**

Adelheid Herrmann  
Dick Stultz No Rec.  
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 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Jim Galt  
 Chairman's signature

Original sponsors: Brown, Ellis,  
Davis, et al.

Funding Information

General Fund	\$ -0-
Other Funds	1,170,000
	<u>\$1,170,000</u>

1 IN THE HOUSE

BY THE RESOURCES COMMITTEE

2 CS FOR HOUSE BILL NO. 239 (Resources)

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 FIFTEENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act making special appropriations to the Alaska  
7 Public Utilities Commission for certain operating  
8 expenses and to the Alaska Power Authority for  
9 payment as grants to certain public utilities for  
10 preparing integrated resource plans; and providing  
11 for an effective date."

12 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

13 \* Section 1. The sum of \$1,000,000 is appropriated from the Railbelt  
14 energy fund (AS 37.05.153) to the Alaska Power Authority for payment as  
15 grants to Railbelt public utilities for the cost of preparing integrated  
16 resource plans required by law.

17 \* Sec. 2. The sum of \$170,000 is appropriated from the Railbelt energy  
18 fund (AS 37.05.153) to the Alaska Public Utilities Commission for three  
19 positions whose responsibilities will be to assist public utilities in the  
20 preparation and review of integrated resource plans required by law.

21 \* Sec. 3. The unexpended and unobligated portions of the appropriations  
22 made by this Act lapse into the Railbelt energy fund (AS 37.05.153)  
23 June 30, 1989.

24 \* Sec. 4. This Act takes effect on the effective date of an Act enacted  
25 by the Fifteenth Alaska State Legislature that requires certain electric  
26 public utilities to prepare integrated resource plans.

Original sponsors: Brown, Ellis,  
Davis, et al.

Funding Information

General Fund	\$ -0-
Other Funds	1,170,000
	<u>\$1,170,000</u>

1 IN THE HOUSE

2 CS FOR HOUSE BILL NO. 239 ( )

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 FIFTEENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act making special appropriations to the Alaska  
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9 payment as grants to certain public utilities for  
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26 public utilities to prepare integrated resource plans.

## LEAST-COST PLANNING

Least-cost planning is a process that allows utilities to evaluate and consider supply and demand side options on an equivalent basis. It presents a "level playing field" approach to objectively evaluating energy conservation, power plant construction, improved performance of existing systems, use of alternative energy services and purchased power based upon their cost and reliability. Least-cost planning is also known as integrated resource planning and value-based integrated resource planning.

Whatever it is called, the process expands a utility frame of reference to include providing energy services: the heat, the light, the power needed to operate homes and buildings. This strategy enables utilities to consider programs which promote energy efficiency on an equal basis with increased capacity. Thus utility conservation programs can be viewed as new electrical sources just as new power plants are.

Interest in least-cost planning is the result of the uncertainties in the utility market and the increased penetration into the market of demand-side management technologies. Utilities understand how to evaluate and rank supply-side options. Demand-side options have, however, developed rather recently and there is not a lot of experience in incorporating these considerations into utility plans. One of the goals of least-cost planning is to expand the historically supply oriented utility by encouraging the development of a demand-side analytical and experience base.

Utilities from Alabama to Wisconsin have undertaken demand side strategies through a least-cost planning process. The American Public Power Association supports the concept of this process, calling it "energy services planning", and stating that it helps "reduce the adverse impact of long lead-times and costly construction of large generating facilities... and encourages optimum utilization of existing equipment." Examples of utility programs include the Snohomish Public Utility in Everett, Washington that has incorporated least-cost strategies into its planning process, and Navopache Electric Cooperative in Arizona that is involved in innovative load management programs including budget billing, off-peak rates, and heat pump and weatherization loans.

State governments have also been actively involved in least cost planning. In 1984 the National Association of Regulatory Utility Commissioners unanimously passed a resolution urging all state and federal regulatory commissioners to adopt a "policy mandating electric and gas utilities to develop and submit for approval least-cost plans." The two states that are recognized as playing leading roles in least-cost planning are Nevada and

Wisconsin. Nevada requires regulated utilities to consider demand and supply options in developing an integrated resource plan. In order for a utility to receive approval for a new generation or transmission facility, the proposed must be included in the utility's least-cost plan. Wisconsin mandates that utilities submit biennial plans for new power projects, and that least-cost analyses of both supply and demand-side options be included as part of the framework of the plan.

This issue has also grabbed the attention of national and state legislatures. Congress has appropriated funds to the U.S. Department of Energy for research, technology transfer, and analytical activities to promote least-cost planning. State legislatures in California, Wisconsin, Florida and Iowa have passed legislation mandating some form of least-cost planning regulation. In the last session of the Alaska Legislature, H.B. 238 was introduced by Representative Kay Brown. This bill would incorporate least-cost planning into the planning process of Alaskan utilities regulated by the Alaska Public Utilities Commission.

Least-cost planning is not a panacea for all of the current uncertainties in electrical planning but it does offer a process that allows demand-side options to compete equally with supply side options. As more utilities and states begin to look at this type of planning strategy they find they must grapple with several important questions: How will they define and determine least-cost? Least-cost to whom, and at what point in the planning strategy? What are the most effective methods of implementing least-cost planning - through voluntary utility initiative or state mandate? There is also a question of what aspects of least-cost planning are applicable to Alaska, with its relatively small utilities, unique distribution system, and currently, in many places, a surplus of power.

In order to explore these issues, the Department of Community and Regional Affairs, in conjunction with the Alaska Rural Electric Cooperative Association, Alaska Public Interest Research Group, Alaska Public Utility Commission, and Chugach Electric Association, is sponsoring a conference on least-cost planning in Anchorage on October 26-27, 1987. Representatives of utilities and regulatory agencies as well as nationally recognized energy analysts who have been involved in least-cost planning have been invited to share their experiences and concerns. In addition their Alaskan counterparts will discuss what applications there could be for Alaska.

# THE LEAST-COST ALTERNATIVE TO NEW POWER PLANT CONSTRUCTION

*A Strategy for Ensuring Utility Investments  
in Conservation and Renewable Energy Resources*

OCTOBER 1985

BY PAUL MARKOWITZ

## AN INTRODUCTION

In the past decade, energy price shocks, supply disruptions, and a major nuclear accident have made it increasingly clear that America depends upon an unnecessarily high-cost and high-risk energy system. The sweeping changes affecting the energy field over the past ten years have perhaps been most profound in the electrical utility industry. Since 1973, electrical demand has declined drastically, fuel prices have escalated, and power plant construction costs have increased exponentially. Rate increases caused by power plant cost overruns have significantly raised electric rates and threaten to add thousands of people to the ranks of the poor and unemployed.

The concept of a "least cost energy strategy" is emerging among consumer advocates, regulatory commissions, and utilities in response to the radical changes affecting the economics of electricity production. The first step towards implementing such a strategy requires that utilities shift their focus from selling electricity to providing electrical services: the heat, light and power needed to operate the buildings and industries in their service area.<sup>1</sup> This strategy enables utilities to consider programs which promote electrical efficiency on an equal basis with the construction of new electrical generating facilities. Thus, utility conservation programs (such as providing low-interest loans for home weatherization or cash rebates for the purchase of energy-efficient appliances)

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**Since 1973, electricity prices have tripled and utilities have cancelled 180 proposed or partially constructed power plants that have cost consumers over \$16 billion dollars to date.**

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can be viewed as new electrical sources just as assuredly as a new nuclear or coal-fired power plant.

While energy efficiency (or conservation) measures are the most cost-effective of all resource options, and therefore the cornerstone of a least-cost investment strategy, the concept really involves utilizing *all* resources which provide the least-cost means of meeting future electrical demand. Thus, *load management*, the shifting of energy consumption from peak periods of the day into slack demand periods; *cogeneration*, the simultaneous production of electricity from industrial heat processes; and *renewable energy resources* such as solar, wind, biomass, and water become integral components of

utilities' least-cost energy investment strategies.

For varying reasons, many electric utilities are reluctant to consider many of the investments which are part of a least-cost investment strategy, particularly conservation, and it is left to legislatures and regulatory commissions to enact least-cost energy planning laws and regulations. These require utilities to comprehensively assess the potential of *all resources options* available for meeting new electrical demand, and to invest in these options based upon their cost-effectiveness.

## ELECTRICAL UTILITIES: AN INDUSTRY IN TRANSITION

The changes affecting electric utilities have been dramatic and swift. From 1945 to 1970, the demand for electricity grew at an average annual rate of 8 percent, and utilities met new demand by constructing new fossil and nuclear-fueled power plants. Economies of scale achieved in power plant size, improvements in power plant productivity, and decreasing fuel costs resulted in declining electrical rates and contributed to electric utilities becoming one of the most sound financial investments in the marketplace.

Then the 1973 oil embargo struck, and the world of the electric utility planner turned upside down. With the astronomical increases in oil prices (and their consequent price effect on oil-fired electrical generation), demand growth for electricity slumped to near zero and continued to grow only a modest two percent annually for the next ten years. At the same time, the long term trend of declining marginal costs associated with larger power plants came to an abrupt halt. From 1971-1981, the real costs (above inflation) for constructing nuclear and coal power plants increased *each year* by 14 percent and 8 percent, respectively.<sup>2</sup>

A myriad of factors contributed to the escalation of power plant construction costs, including: higher interest rates, new safety and environmental regulations, mismanagement, and technological difficulties resulting from the rapid escalation in power plant size. As a result, since 1973, electricity prices have tripled and utilities have cancelled 180 proposed or partially constructed power plants that have cost consumers over \$16 billion dollars to date.<sup>3</sup> Utilities across the country are struggling to pay for power plants whose electricity is neither needed nor affordable.

The impact on utility ratepayers from these power plant cost escalations is devastating. Many of the power plants ordered in the early 1970's have recently started (or soon will

be) producing power. The rate shock resulting from the inclusion of these power plant construction costs in electrical rates (construction costs are generally not passed on to ratepayers until plants are completed or officially cancelled) is expected to increase consumers' rates 50-180 percent in many utility service areas, and impact 35 million families in 25 states.<sup>4</sup> The employment and economic repercussions resulting from these rate shocks threaten to be equally disastrous. In a report commissioned by Suffolk County in Long Island, New York, rate increases necessary to pay for the Shoreham Nuclear Power Plant are expected to eliminate 35,000 jobs, disqualify 37,000 families from the mortgage market, increase foreclosures and home abandonment by up to 2000 per year, and push 11,000 households below the poverty line.<sup>5</sup>

## LEAST-COST ENERGY OPTIONS

A quiet revolution in the energy field has been manifested in the rapid movement toward least-cost energy efficiency and renewable energy investments. According to energy conservation advocate Amory Lovins, since 1979, the United States has obtained more than one hundred times as much new energy from efficiency improvements as from all net expansions of energy supply. Technological developments have spurred extensive design improvements in America's electricity consuming buildings and devices. As a result, the efficiency of the best available commercially-available motors has doubled, lighting systems tripled, major appliances quadrupled, and the efficiency of building space conditioning (heating and cooling) has improved by a factor of ten.<sup>6</sup>

For example, Norelco has developed its SL-18 light bulb which uses only 18 watts of electricity, yet produces the same amount of light as a 75-watt incandescent bulb. The bulb lasts more than 13 times longer, provides light of better quality, and uses a high-frequency solid-state ballast which eliminates flicker and hum. By replacing 75 watts with 18 watts, an individual is essentially installing a 57-watt power plant in their home. The SL-18 repays its high retail cost (\$15-\$20) two-three times over by saving \$40 worth of electricity plus \$10 for a dozen replacement bulbs. When universally used, SL light bulbs and other equally efficient bulbs, will displace (at one-to-two cents/kilo-watt hour (KW-h)) the need for thirty 1000 mega-watt power plants (at seven

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**In an era of uncertain demand, utilities find that conservation and load management investments offer a unique opportunity to reduce high capital costs and the financial risks associated with excess generating capacity.**

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cents/KW-h.). Savings of similar magnitude exist for appliances, industrial processes, and other electrical end-uses, as well.<sup>7</sup>

Renewable energy technologies such as photovoltaics (solar electric cells), wind energy systems, passive solar applications, solar flat plate collectors (for hot water and space heating), and biomass conversion (wood, alcohol fuels, etc.) have also become increasingly cost-competitive. The Public Utilities Regulatory Policy Act (PURPA) has played a significant role in this recent transition towards renewable energy resources. PURPA requires electric utilities to purchase electricity from small-power (renewables and cogeneration) producers up to the utility's cost of producing electricity from conventional

most dramatic example of this shift toward renewables is found in California, where by mid-1984 over 10,000 megawatts of small, independent sources were planned or under construction, enough to supply over 20 percent of the state's power by 1990.<sup>8</sup>

In addition to their cost-effectiveness, energy efficient and renewable energy technologies create several times as many jobs per dollar as their conventional counterparts. They also represent the best energy supplies for abating the long-term problems of acid rain, carbon-dioxide build-up, and the proliferation of fissionable materials that are posed by continued dependence on conventional energy sources.

## UTILITY SUPPORT FOR LEAST-COST OPTIONS

A few utilities have heeded the changing economics of electrical generation, and begun developing programs which promote least-cost electrical investments. Utilities, such as Pacific Power and Light, Northern States Power Co., and New England Electric Systems are finding that least-cost investment options are not only much cheaper than conventional generating sources, but also improve their own financial well-being. South California Edison, one of the nation's largest utilities, announced a change in its 1981 corporate policy which involved "devoting corporate resources to the accelerated development of a wide variety of renewable resources, cogeneration, conservation, and load management."<sup>9</sup>

Demand-side options (efficiency and load management), cogeneration, and renewable energy resources reduce utility planning uncertainty and risk. These investment options are small, modular, and incremental in nature. Compared to conventional coal and nuclear-fired power plants, they have shorter production lead times, low capital requirements, and

## MODEL CONSERVATION PROGRAMS

Pacific Gas and Electric Company (California), the nation's largest private utility, recently embarked on its Great Energy Rebate Program. As part of this program, commercial, industrial and agricultural electric customers are paid up to \$150,000 per customer account to convert to energy-saving equipment and products. Rebates are offered for such equipment as lighting conversions, air conditioners, industrial motors, refrigerators and freezers, heating system conversions and modifications, and load management controls. Customers can obtain rebates which defray 25% to 40% of the purchase and conversion costs for efficient products, and rebates are paid on the basis of up to \$250/KW for saved electrical capacity and \$.06/KW-h for saved energy. Similar rebates are also available for residential customers.<sup>10</sup>

General Public Utilities (of Pennsylvania and New Jersey) has developed an alternative financing program for home weatherization through its Residential Energy Conservation Action Program (RECAP). Under RECAP, contractors install cost-effective conservation measures free of charge to individual residences. The utility pays the contractor for the actual, measured long-term reductions in energy consumption over a period of years at an agreed upon rate. Energy savings from the program are expected to exceed costs by a ratio of five to one over a 10 year period, and General Public Utilities has already completed weatherization for over 5,000 homes.<sup>11</sup>

offer the utility a quick return on its investment. In an era of highly uncertain demand, utilities are finding that conservation and load management investments offer a unique opportunity to improve load factors, increase velocity of cash flow, reduce high capital costs, and reduce the financial risks associated with excess generating capacity.

Untapped investments in energy efficiency and load management offer enormous potential for meeting new electrical demand and remain the most cost-effective of all resource options. Utilities, regulators, and consumer advocates have developed programs designed to increase the efficiency of America's electrical consumption.

Most utilities offer some type of program promoting efficiency investments, ranging from simple bill inserts on conservation tips and school education programs to innovative financing programs like those cited above. However, very few utilities have begun to comprehensively investigate the full potential for improving the efficiency of their customers' energy consumption or to implement incentive programs which are designed to promote efficiency investments.

### UTILITY OPPOSITION TO LEAST-COST OPTIONS

The majority of utilities are still planning for high electrical demand growth in the future, despite the drastic decline in the rate of electrical demand growth over the past decade. And they are planning on meeting this demand primarily by building large coal-fired electrical generating plants (and to a lesser extent nuclear power), despite the radical changes in the economics of central power generation. Most utilities are reluctant to shift to a least-cost investment strategy for a variety of reasons, including:

- Utilities have traditionally seen themselves as suppliers of a commodity (electricity), and like most other private enterprises, strive toward increasing profits by increasing sales of their commodity. This has been historically accomplished by constructing large power plants.
- Most utility executives wait for positive signs from their commissioners that least-cost investments will receive preferential rate treatment.
- The revenue formulas established by public utility commissions, which are used to determine return on investment, are often based on total capital investment. Utilities have a built-in incentive to overinvest in capital-intensive plant and equipment.
- Efficiency measures, programs, and technologies for saving energy and electricity are still relatively unfamiliar to the utility industry, and are viewed as risky until proven over a long period.<sup>12</sup>

Because of this reluctance, a few state legislators and regulators have begun to adopt statutes and regulations which assure that utilities will comprehensively examine all resource options, and invest in these on a cost-effective basis.

### STATE REGULATORY COMMISSIONS CAN ENSURE LEAST-COST INVESTMENTS

The least-cost concept has garnered strong support from some impressive official bodies, including the American Public Power Association, the American Gas Association, and the National Association of Regulatory Utility Commissioners (NARUC). At its 1984 annual convention, NARUC unanimously passed a resolution urging all state and federal

regulatory commissions to adopt a "policy mandating electric and gas utilities to develop and submit for approval least-cost resource plans".<sup>13</sup>

Legislators and commissioners have begun to develop laws and regulations to compel utility investment in demand-side options and renewables due to many utilities' reluctance to pursue least-cost planning on their own initiative. Several states, including California, Wisconsin, Florida, Iowa, and Nevada have now adopted some form of least-cost electrical planning regulations.

The state of Nevada has developed one of the most comprehensive least-cost planning regulations in the country. The

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### Citizen-based organizations and public interest intervenors have been the primary motivating force behind the adoption of many current least-cost planning laws and regulations.

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Nevada Utility Resource Planning Act of 1983, authored by the state's Office of Consumer Advocate, requires electric utilities to submit to the Nevada Public Service Commission a fully integrated, long-range resource plan every two years. These plans must demonstrate that *all* aspects of a utility's future energy needs and resource options have been considered.

Nevada utilities are required to conduct assessments of the cost-effective potential for each resource option, including efficiency, load management, cogeneration, and renewables, and then integrate and prioritize those options according to their cost-effectiveness. Perhaps most importantly, utilities cannot receive approval for a new power plant unless the plant has been previously approved as part of the utility's least-cost resource mix. The Nevada model includes provisions which assure that:

- Demand forecasts are based upon inventories of electrical end-uses such as lighting, heating, and cooling.
- Utilities must also submit a two-year implementation plan that specifies which least-cost resources will be utilized over the next two years.
- Standardized planning methodologies and models are used by all utilities to assure long-term consistency.
- Utilities are held responsible for the creation and coordination of all plan components.
- Enforcement mechanisms are developed to assure utility compliance with their resource plans.<sup>14</sup>

Most states have adopted only individual components of comprehensive least-cost planning regulations, and consequently lack the ability to ensure utility investments on a least-cost basis. For example, many public utility commissions have specific statutory authority to require utility investments in conservation and load management but lack the capability to adequately evaluate utility assessments of conservation potential or program proposals. Other commissions require utilities to file conservation plans which must evaluate all resource options available for meeting new electrical demand yet lack the authority (or initiative) to deny approval of the plan or to require that utilities invest in all cost-effective conservation investments prior to new supply resources.

Unfortunately, very few commissions have adopted comprehensive least-cost regulations which ensure that utilities

invest in the most cost-effective resources to meet new electrical demand.<sup>15</sup> This is due to a variety of reasons. Some state commissions lack adequate information and analytic planning tools, while others are awaiting the results of those states which have enthusiastically promoted conservation. Still, other commissions believe that utilities should decide how to meet demand for electricity or that existing regulations are sufficient in promoting utility conservation investments. However, a truly integrated and comprehensive least-cost planning model, such as Nevada's, is vital to assure utility investments in least-cost energy resources.

## A FRAMEWORK FOR CITIZEN ACTION

A well-informed and organized consumer-based coalition can significantly influence its state regulatory and legislative bodies to adopt least-cost planning laws and regulations. Citizen-based organizations and public interest intervenors have been the primary motivating force behind the adoption of many current least-cost planning laws and regulations. The following are specific actions that public policy organizations and citizen-based groups can take to promote least-cost energy planning in their state:

1. Review Existing Statutes and Regulations Regarding Utility Investments in Least-Cost Energy Resources. Utility statutes and regulations vary from state to state. Thus, a crucial first step involves reviewing existing statutes and regulations to reveal possible gaps in a comprehensive least-cost planning process. Some of the more pertinent questions to pursue, include:
  - Does your public utility commission have the regulatory authority to require utility investments in customer efficiency improvements?
  - Are utilities required to undertake a comprehensive assessment of the conservation potential in their service districts?
  - Are utilities required to file long-range resource or conservation plans? If yes, do these plans include assessments of demand-side and supply-side options and do they require these options to be integrated according to their cost-effectiveness?
  - Does your commission have an adequate enforcement mechanism which ensures that utilities invest on a least-cost basis, i.e. denial of a power plant permit due to lack of consideration of alternatives?
  - Has the state adopted favorable buyback regulations to require utilities to purchase electricity from small-power producers, including cogeneration and renewables?

2. Develop an Independent Conservation Potential Assessment. Universities offer an ideal base for the development of independent assessments of the potential for energy conservation in a utility service district or the state as a whole. For example, the Center for Energy Studies at the University of Texas, in conjunction with Lawrence Berkeley Laboratories, has recently developed an assessment of the conservation supply potential for residential and commercial buildings in the state of Texas.<sup>16</sup>

University departments with experience in quantitative analysis, computer modeling, or electrical planning issues can be solicited to develop specific information:

- An inventory of available efficiency measures, methods, and technologies capable of cheaply and reliably supplying or saving energy and power.
- A detailed inventory of energy use, indicating how much electricity is consumed for what purposes within the state.
- An assessment of the potential for efficiency improvements in the residential, commercial, and industrial sectors.
- A survey of information on state commission orders, regulations, rate treatments and case histories of efficiency programs.

3. Form a Coalition. A successful strategy will be based on linking least-cost planning with other utility issues that are affecting ratepayers. Least-cost planning offers a long-term, comprehensive process for assuring the most cost-effective implementation of electrical resources as well as an ideal complement to shorter-term and single focus, and sometimes adversarial, utility issues.

For instance, "rate shock" (the rate impacts from the cost of new power plants) is an excellent organizing issue because the inclusion of expensive, new power plants costs in the rate base directly result in higher utility bills. While citizen groups argue against the inclusion of imprudent power plant construction costs in the rate base, rate shock also presents an excellent opportunity for consumers to press their regulators with the question of, "How are you going to prevent these astronomical rate increases from occurring in the future?"

Least-cost planning can be used to address other utility issues, such as utility proposals for the construction of new coal or nuclear plants, the inclusion of construction work-in-progress (CWIP) costs in the rate base, and the impacts of rate increases on low-income households. Least-cost electrical planning offers an ideal issue for forging statewide coalitions which can bring together diverse organizations, including low-income, senior citizen, safe energy, and consumer groups.

## FOOTNOTES

<sup>1</sup> *The Least Cost Energy Strategy: Minimizing Consumer Costs Through Competition*, 1979. Roger Sant, Carnegie Mellon University Press, Pittsburgh, PA.

<sup>2</sup> *Power Plant Cost Escalation: Nuclear and Coal Costs, Regulation and Economics*, 1981. Charles Komanoff, Van Nostrand Reinhold, NY.

<sup>3</sup> *Electricity: New Consumer Choices*, 1985. Dick Munson, Center for Renewable Resources, Washington, DC.

<sup>4</sup> *Rate Shock: Confronting the Cost of Nuclear Power*, 1984. Alan Noyce, Environmental Action, Washington, DC.

<sup>5</sup> *Operation Vs. Abandonment of the Shoreham Nuclear Plant: The Effect on Long Island Unemployment*, 1984. Greg Palast, Union Associates, New York, NY.

<sup>6</sup> "Saving Gigabucks with Negotiators", 1985. Amory Lovins, *Public Utilities Fortnightly*, March 21, 1985.

<sup>7</sup> *Ibid*

<sup>8</sup> *Electricity's Future: The Shift to Efficiency and Small-Scale Power*, 1984. Chris Flavin, Worldwatch Institute, Washington, DC.

<sup>9</sup> *1981 Conservation and Load Management Program*, 1981. South California Edison Co., Rosemead, CA.

<sup>10</sup> "The Great PG & E Rebate Program", 1984. Pacific Gas and Electric Co., San Francisco, CA.

<sup>11</sup> "Don't Pay for Insulation... Buy Conservation," 1983. Slide show presentation explaining General Public Utilities RECAP Program. Richard Esteves, Manager of Conservation Communications, General Public Utilities, Parsippany, NJ.

<sup>12</sup> "Questions and Answers" from Nevada Public Service Commissioner Stephen Wiel at March 5, 1985 hearings before the Energy Development and Applications Subcommittee hearings on Department of Energy 1986 budget.

<sup>13</sup> Resolution on gas and electric utility least-cost resource plans, 1984. Proposed by the Ad Hoc Committee on Energy Conservation of the National Association of Regulatory Utility Commissioners (NARUC). Adopted by NARUC at their 1984 Annual National Convention, NARUC, Washington, DC.

<sup>14</sup> "Utility Resource Planning: The State of Nevada Adopts an Integrated Planning Model", 1984. Jon Wellinghoff and Cynthia Mitchell, Nevada Office of Consumer Advocate, Carson City, NV.

<sup>15</sup> "Results of Survey of Regulatory Utility Commission's Electric Resource Planning and Conservation Activities", November 1985. Conducted by Congresswoman Claudine Schneider's office for hearings on the Least Cost Planning Initiative. Hearings held before the House Energy Development and Applications Subcommittee, September 26, 1985.

<sup>16</sup> *Electrical Energy Conservation Supply Potential in the Texas Building Sector*, December 1985 (expected date). Center for Energy Studies, University of Texas, Austin, TX, and Energy Efficient Buildings Program, Lawrence Berkeley Labs, Berkeley, CA. Commissioned by the Texas Public Utility Commission, Austin, TX.

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