THE ECONOMIC SIGNIFICANCE
OF THE
POWER COST
EQUALIZATION PROGRAM

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Blue Ribbon Panel

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THE ECONOMIC SIGNIFICANCE OF THE POWER COST EQUALIZATION PROGRAM

EXECUTIVE SUMMARY

WHAT IS THE PROGRAM?

In FY 1996 the Power Cost Equalization (PCE) Program provided $19.202 million of financial assistance to electric utilities in 190 rural Alaska communities where the cost of electric power is greater than urban Alaska because of small market size, dependence on expensive fuel oil for generation, and the high cost of doing business in remote areas.

The PCE program is designed to pay a portion, currently 95 percent, of the legitimate electric generation costs between a floor and a ceiling, for a basic level of electric service for residential and commercial customers (including public schools) and community facilities. The floor is set at a level equal to the cost for electricity generation in urban areas, 9.5 cents in 1996, and the ceiling is set at the level of reasonable maximum cost for a small utility, 52.5 cents. In recent years PCE budget restrictions have kept payments to eligible utilities below 95 percent of legitimate costs.

Thus rural utility customers pay at least as much as urban consumers for their electricity, but a portion of the extra cost of generation is covered by the PCE program. Furthermore only the first 700 kwh per month of use by each residential or commercial customer is eligible for the program, and only 70 kwh per month for each community member for community facilities is eligible. As a result, only 38 percent of all electricity sold in PCE communities in 1996 qualified for assistance. In addition only legitimate costs are covered, as determined by Alaska Public Utilities Commission (APUC).

WHO DOES IT SERVE?

The typical (median) community served by PCE has a population of 264. Bethel, with a population of 5,195, is the largest, and only 8 other communities (Unalaska, Nome, Kotzebue, Cordova, Dillingham, Craig, Naknek, and Haines) have a population greater than 1,000. The total population served is 75,767.

The assistance provided to the utilities is primarily targeted toward residential customers in the PCE communities. The average income of PCE households is $49,825 compared to $65,054 for non PCE communities. (Although the average income in the typical PCE
community is considerably less, $35,203, because average incomes are higher in the larger PCE communities.) The unemployment rate among PCE households is 15 percent compared to 8 percent for non PCE communities. 18 percent of families in PCE communities have incomes below the poverty level compared to 6 percent in non PCE communities.

The typical PCE utility generates about 652,000 kwh annually, about the amount that Chugach Electric Association, the largest electric utility in the state, sells in a typical 6 hour period. The 9 largest utilities that serve the communities of greater than 1,000 population account for just over 50 percent of the generation of all the PCE utilities which in 1996 totaled 369 million kwh. The cost of electricity provided by the typical PCE utility is $.42 per kwh. This is the amount per kwh the residential customer would need to pay to cover all costs of production. Because of differences in size and location, some utilities have a lower cost, although none are as low as Anchorage where the average cost is about $.10 per kwh. At the other extreme some utilities report an average cost in excess of $.60 per kwh.

WHAT BENEFIT DOES IT PROVIDE?

The typical community gets $71 thousand per year in financial assistance through the PCE program, and this covers about 31 percent of the total costs of providing electricity.

About 68 percent of the total, $13.092 million, in FY 1996 supported sales to residential customers. Financial assistance under the PCE program reduces each eligible kwh of electricity to residential customers by an average of $.22. (87 percent of residential sales are eligible for PCE.) Residential customers in PCE communities still pay twice the urban average for electricity after the PCE assistance--$.20 for the average kwh. This is because not all consumption is eligible, not all reported costs are approved by the APUC, the program pays only 95% of legitimate costs between the floor and the ceiling, some utilities have costs above the ceiling, and the program has not been fully funded in recent years. The range of residential rates after application of the PCE assistance is from $.10 to $.35 per kwh.

Because of the high cost of electricity, even with PCE assistance, and the low household income, the average residential customer in the PCE communities uses 4,933 kwh of electricity in a year, about 65 percent as much as the typical customer in Anchorage, who uses 7,619. (The average in the typical PCE community is less, 3,921 kwh per year, because average consumption is higher in the larger PCE communities.)

In spite of lower consumption, residential monthly bills are higher in PCE communities, even with PCE. The average residential customer of a PCE utility has a monthly bill of $75, after receiving assistance, compared to $61 for Anchorage. (The average in the typical PCE community is less, $66, because average consumption is higher in the larger PCE communities.) Without PCE the monthly bill would have been $121.

If the PCE residential customer used as much electricity as the average household in Anchorage, the typical utility average monthly residential bill would be $125 with PCE. In the
absence of PCE the monthly bill at the Anchorage rate of use with all utility costs paid by the customer would be $264, 433 percent of the Anchorage bill.

About 19 percent of PCE assistance, $3.683 million in FY 1996, went to support electricity use in community facilities in PCE communities--an average of $2,537 per facility per year. This assistance reduced the cost of 98 percent of the electricity used for this purpose. Since local residents bear the cost of electricity used by these facilities, the savings for the average PCE household from this assistance was $158 per year.

The remaining 13 percent of PCE assistance, $2.407 million in FY 1996, helped pay for about 10 percent of the electricity used by the commercial sector, including the public schools.

**WHAT WOULD HAPPEN IF PCE DISAPPEARED?**

The typical PCE utility receives about $71 thousand of PCE financial assistance annually which accounts for about 31 percent of the total cost of the providing electricity to the community. Elimination of that assistance would put many small utilities at financial risk and require electricity users to pay substantially higher electricity bills at the same time that it reduced the amount of electricity they used.

Without PCE the utilities would be forced to raise their rates substantially, and the resulting drop in sales would require further rate increases to generate sufficient revenues to cover all costs. Although reduced sales would lower costs because less fuel would be needed, a large share of utility costs are fixed. This results in the potential for a utility to fall into a "death spiral", in which continuously rising rates are never able to generate enough revenue to cover costs. A utility caught in a death spiral cannot survive without an external source of financial assistance.

The likelihood that a utility would fall into a death spiral is a function of how sensitive electricity sales are to the higher electricity prices necessitated by the elimination of PCE. If a doubling of the price paid by customers reduced sales by 20 percent, death spirals would be unlikely. But if a doubling of the price reduce sales by 30 percent, utilities in half the communities served by PCE would be unable to cover their costs through higher rates.

The burden of the loss of PCE financial assistance to utilities would fall primarily on the residents of the communities currently served by PCE. This burden would be a combination of higher electricity bills and less electricity use. Customers would be spending more for less electricity and have less income available for other needs. For a representative community like Elim, the residential price of electricity would increase 190 percent--from $.19 to $.55. Average annual consumption would fall by 38 percent--from 4,202 to 2,608 kwh. The average monthly residential bill would increase by 80 percent--from $66 to $119. Without PCE the average residential customer would be devoting 4.4 percent of household income directly to paying for electricity. Including payments in support of community facility electricity use, 6.1 percent of household income would be devoted to payments for electricity.
Most of the remaining financial burden of the loss of PCE would fall on commercial users of electricity, and the higher costs imposed on them would be passed on to customers as higher prices and back onto workers as lower wages. Some of the burden would thus fall on local residents and some would be shifted outside the PCE communities. Since the public schools are included in this category for purposes of PCE, some of the burden, estimated at about $1.406 million would fall on the state treasury.

The remainder of the financial burden would fall on state and federal government agencies operating in PCE communities. These government agencies do not qualify for PCE assistance so the rate they are charged covers the full cost of providing their electricity. However since elimination of PCE combined with reduced sales would drive up the average cost of electricity for the PCE utilities, the rates charged to all customer classes would rise. State government agencies would pay about $.290 million in additional charges for electricity.

In addition to the quantifiable direct financial burden on local residents, utilities, and state government from the elimination of the PCE program, there are indirect burdens both for the PCE communities and for the state.

The public and private physical infrastructure necessary to deliver the educational, sanitation, health, transportation, and communication services to sustain rural Alaska communities, and enhance their opportunities for economic development, depends directly on the availability of a reliable and affordable source of electricity. Furthermore there are some special uses of electricity in rural areas that enhance the quality of life in ways urban residents often overlook, such as refrigeration for preserving subsistence harvested food and streetlights for additional safety during the long hours without sunlight in the winter.

The state which has paid for much of the investment in the public infrastructure in rural Alaska also has an interest in its continued ability to provide the services to sustain rural communities. Loss or deterioration of these services would be detrimental to the physical and psychological well being of rural Alaskans and responding to the problems this would create would put an additional burden on state financial resources.

WHAT IS THE ECONOMIC SIGNIFICANCE OF PCE?

Elimination of PCE assistance would draw $19.202 million out of the rural Alaska economy. This loss of purchasing power translates into a loss of $4.908 million in wages and 210 jobs (annual average) throughout Alaska. Because most of the PCE communities are too small to support much business activity locally, a large share of this loss would occur in urban Alaska.
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1. DESCRIPTION OF THE POWER COST EQUALIZATION PROGRAM

The Power Cost Equalization Program (PCE) was established in 1985 to help electric utility customers by paying a portion of the cost of electricity in high cost areas of the state where rates are often three to five times that of urban areas. Prior to 1985 assistance to rural customers was provided by the Power Cost Assistance Program and before that (1980) by the Power Production Assistance Program.

The program is based on the recognition that affordable electricity is critical to the viability of rural Alaska. This idea is reflected in the PCE Program Manual which states:

PCE is a core element to insure the financial viability of centralized power generation in rural communities, and therefore increase the standards of living through the availability of communications, lighting, and the operation of a variety of infrastructures, including water and sewer systems, incinerators, etc.

According to the Statistical Report of the Power Cost Equalization Program for Fiscal Year 1996 $19.2 million in assistance was provided to 190 communities through 96 separate utilities (Figures 1.1 and 1.2). This represents a population of about 76 thousand and includes most of the electric utilities within the state. Almost all the electric utilities that do not participate in the program are located in the Railbelt or in maritime locations. These non PCE utilities have access either to low cost natural gas or to hydroelectric power (primarily from the Four Dam Pool facility) which allows their customers to enjoy low electricity rates. In contrast, almost all of the PCE utilities rely entirely on fuel oil for generation which must be transported to rural communities at great expense. (One of the requirements of program eligibility is that participating utilities must produce more than 75 percent of their electrical consumption from diesel-fired generation.)

The PCE is administered by the Division of Energy within the Department of Community and Regional Affairs which also determines the eligibility of customers, including community facilities. The Alaska Public Utilities Commission determines if a utility is eligible to be in the program as well as the amount of assistance that will be provided to each utility for each eligible kwh.

The PCE payment is made to the utility based upon the allowable costs of providing electric power to residential, community facility, and commercial customers over and above the costs faced by urban utilities. The price of program eligible electricity to PCE customers in these classes is higher than the price faced by customers of non PCE utilities, but lower than the published rates of the PCE utility.

Five classes of customer are recognized by the PCE program. These classes and the
eligible level of consumption for each are as follows:

Residential — up to 700 kwh per customer per month eligible for PCE. This eligibility level exceeds the typical monthly usage of most residential customers, so most residential sales are eligible for the PCE payment.

Commercial — up to 700 kwh per customer per month eligible for PCE. Only the smallest commercial customers use less than 700 kwh per month so a large share of commercial sales are not eligible. The commercial class is defined to include the public schools.

Community Facilities — as a group can receive up to 70 kwh per month multiplied by the population. This limit is high enough so that in most communities all use by community facilities is PCE eligible. Examples of customers in this category include water and sewer facilities, charitable educational facilities, public outdoor lighting, and other community buildings whose operation is not paid for by the state or federal government or by a private commercial organization (not operated for profit and open to the public).

Government — state and federal offices and facilities, with the exception of schools, are ineligible to receive PCE.

Other -- a category for miscellaneous sales in a few of the PCE communities. These sales are not eligible for PCE.

Because electricity use per month only up to a limit is eligible for PCE, the average price of electricity for each customer is the weighted average of the price for PCE eligible sales and the "full published rate" for non eligible sales. The "full published rate" includes all utility costs without taking the PCE payment into account. For example Figure 1.3 shows the rate faced by a residential customer served by a hypothetical PCE utility. The charge for PCE eligible electricity each month is $.13 which the customer would pay for monthly use up to 700 kwh. Use above that amount would be at the "full published rate" of $.50. The average price of electricity for the customer would be $.13 up to 700 kwh and gradually rise if monthly use exceeded 700 kwh.

The size of the PCE payment to the utility is based on a percentage (95 percent) of the eligible costs between a floor ($.095 per kwh) and a ceiling ($.525 per kwh) level (See Figure 1.4). Costs below the floor and above the ceiling are not eligible for the PCE payment. The maximum payment is $.4085 per kwh (95 percent of the difference between $.525 and $.095). The floor is set at a level that reflects the cost of generation in urban Alaska (As such it may vary slightly from year to year.), and the ceiling is set at a level that reflects the maximum reasonable cost per kwh that a rural utility might face. Thus all customers of PCE utilities will pay at least the amount, currently $.095, equal to the average cost of electricity in urban Alaska. The size of the PCE payment per kwh to the utility will in general vary with the cost of generation for the utility.
Not all costs associated with providing electricity for eligible sales are eligible costs. The utility must meet efficiency standards and must submit its costs for review by the Alaska Public Utilities Commission (APUC). The APUC determines which costs are reasonable and the Division of Energy administers the payments based upon that determination.

A limit has been established on eligible fuel expenses based upon a minimum kwh generated per gallon of fuel use standard. This means that fuel use above the standard is not included in PCE eligible costs. This standard increases with the size of the utility and is higher for those utilities that have some hydroelectric generation. For example the standard for all diesel utilities which have annual sales between 500 thousand and 1 million kwh (the size of the typical PCE utility) is 10 kwh per gallon, or .1 gallon per kwh. If a utility of this size is only able to generate 8 kwh per gallon, .125 gallon per kwh, the expenses associated with the .025 gallon per kwh above the standard would not be an allowable cost in the formula for the determination of the PCE payment. (Efficiency improvement assistance such as general engineering and technical support for system upgrades, including the analysis of systems to determine appropriate efficiency improvements, is available through the Division of Energy.)

In addition to efficiency standards only reasonable costs of operation and maintenance are eligible. These consist primarily of fuel expenses, salaries, insurance, taxes, maintenance supplies, and interest. Specifically excluded are profits as well as depreciation expenses for facilities of regulated utilities obtained by grants. The APUC reviews the costs for each utility and excludes duplicate and unnecessary costs.

Finally the size of the PCE payment is calculated based upon the lessor of utility costs or its full published rates. For many smaller utilities all customers pay the same rate, reflecting the fact that the cost of providing electricity to each class of customer is about the same. Some utilities however have different rates for different classes of customers in recognition of the fact that costs of providing electricity vary by the type of customer. For these utilities the PCE payment is based on the rates for eligible customers if those rates are less than the average cost. Thus the PCE payment will reflect the costs to serve those customers as long as they are equal to or below the average cost of all customers. However the payment will not be based on rates that are above the average for all customers.

If there is not enough money to fully fund the PCE program in a given fiscal year, all payments are reduced by the same percentage. Fiscal year 1996 was the fifth consecutive year in which there was a shortfall.

In summary there are several reasons why the electricity rates for the PCE communities will vary and will not all be at the floor established by the average cost of electricity in urban Alaska. First, all costs above the ceiling are disallowed. Second, some costs are disallowed because of efficiency standards. Third, some costs are disallowed because they are found to be unnecessary or duplicative. Fourth, only 95 percent of allowable costs are paid under PCE. Finally, the program may not receive full funding for the year, in which case the payment is prorated on a percentage basis across utilities.
FIGURE 1.1
PCE UTILITIES
FIGURE 1.2
PCE UTILITIES

FY96 PCE Program Participating Utilities/Communities

Prior program participants not currently active:

FIGURE 1.3

RESIDENTIAL CHARGE PER KWH AS MONTHLY USAGE INCREASES

TOTAL RESIDENTIAL BILL AS MONTHLY USAGE INCREASES

November 16, 1998
FIGURE 1.4
THE PCE FORMULA

<table>
<thead>
<tr>
<th>UTILITY COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs NOT covered by PCE → Costs above 52.5¢/kwh</td>
</tr>
<tr>
<td>Costs between 9.5¢/kwh and 52.5¢/kwh → PCE pays 95% of the verifiable and reasonable costs in this bracket</td>
</tr>
<tr>
<td>Costs NOT covered by PCE → Costs up to 9.5¢/kwh</td>
</tr>
</tbody>
</table>
2. CHARACTERISTICS OF POWER COST EQUALIZATION PROGRAM COMMUNITIES AND UTILITIES

In FY 1996 the Power Cost Equalization (PCE) Program provided assistance through 96 electric utilities to 190 communities in Alaska with a combined population of 75,767. This represents 12 percent of the population of the state and the vast majority of electric utilities.

The communities served by PCE are the smallest communities in the state and located in the most rural parts of Alaska (Figure 2.1). Populations vary from a high of 5,195 in Bethel to a low of 11 in Telida. The population of the median community (half the communities have more population and half the communities have less) is 264, and all but 9 have a population of less than 1,000. About one third of the population served by PCE resides in the 9 largest PCE communities, one third are in communities of 500 to 1000, and the remainder are in communities of less than 500 (Figure 2.2).

The income in households in PCE communities is less than the state average and less than that of communities not receiving PCE (Figure 2.3). The annual income for the typical (average) household in all PCE communities in 1989 (converted to 1996 $) was $49,825, and $40,540 excluding the largest PCE communities. This was 77 percent of the average household income in non-PCE communities ($65,054).

The average annual household income in the median PCE community was $35,203 in 1996 dollars (Figure 2.4). This means that the annual average household income was higher than...
that amount in half the communities and lower than that amount in half the communities. Average household income was highest in Akhiok at $84,964 and lowest in Stony River at $9,141.

Other economic indicators show that the community average household income figure masks considerable variation in household circumstances within communities and the fact that a substantial share of the households in the PCE communities are economically disadvantaged. The unemployment rate in 1990 for the PCE communities in the aggregate was 15 percent, and excluding the largest of the PCE communities it was over 20 percent. In contrast the unemployment rate in the non-PCE communities was 8 percent. This suggests that a large share of income in PCE communities comes from public sources and this is supported by the fact that in 1990 2 percent of household income in PCE communities was from public assistance. Outside the largest PCE communities the share was over 3 percent compared to less than 1 percent in non-PCE communities.

In addition, as of 1990 nearly 18 percent of families in PCE communities were identified as having income levels below the poverty threshold as defined by the federal government. Excluding the largest PCE utilities the figure was 24 percent. This compares to less than 6 percent for the non-PCE communities. (The poverty thresholds for 1989 as determined by the Bureau of the Census varied by family size and number of related children but were not adjusted for differences in the cost of living among places. For example the threshold was $5,947 for a single adult over 65 living alone and $12,575 for a family of four with 2 children.) The percent of families below the poverty threshold varied from 0 percent for some communities up to a high of 100 percent in Stony River (Figure 2.5).

PCE communities are scattered throughout rural Alaska, with the largest numbers in the interior and western parts of the state (Figure 2.6). About 35 percent of PCE utility sales were in Southwest Alaska followed by 26 percent in Arctic/Northwest Alaska and 20 percent in Southeast Alaska. Interior Alaska accounted for 13 percent of PCE sales and South Central Alaska accounted for the remaining 6 percent. In contrast 68 percent of non PCE sales took place in South Central Alaska with 16 percent in Southeast and Interior respectively. There was virtually no non-PCE activity in either Arctic/Northwest or Southwest Alaska.

Because of the broad geographic distribution of the PCE communities throughout rural Alaska and their large number, it is easier to describe the PCE communities by saying that virtually every community in Alaska is a PCE served community except those served by the largest utilities in the state, or the few smaller utilities fortunate enough to have access to a relatively inexpensive source of fuel for electricity generation. Thus the utilities serving the Railbelt communities and the larger maritime communities, mostly in Southeast Alaska, are the main non-PCE utilities in the state.

In addition to small community size and marginal economics, the high cost of fuel oil is another distinguishing feature of PCE communities (Figure 2.7). The median reported cost of fuel oil in FY 1996 among PCE utilities was $1.14. The range was from a low of $.71 for communities such as Tok and Naknek with relatively good transportation access, to a high of
$2.26 for Chignik Lake in Southwest Alaska. With the exception of a few utilities where a portion of electricity is generated by hydro power, all PCE electricity comes from diesel generation.

Small community size, remoteness, and the high cost of fuel combine to result in high costs of electricity in the PCE communities. The full published residential rate faced by the average PCE utility customer was $.28 in 1996 compared to $.10 for the non-PCE utilities. Figure 2.8 shows that the full published residential rate for PCE utilities in 1996 varied from a low of about $.15 in several communities on the North Slope to a high of $.625 for several communities in the Interior of the state. The rate for the median PCE utility was $.42.

The higher revenue requirement per kwh sold for the PCE utilities was only partially offset by the PCE assistance so that electric rates for the PCE utilities remained above non-PCE utilities after the PCE adjustment. The average PCE utility residential customer paid $.18 per kwh compared to $.10 for the customer in Anchorage or Fairbanks, and $.09 for the customer in Juneau. The range was from $.09 to $.41. The average PCE utility commercial customer paid $.26 per kwh compared to between $.07 and $.09 per kwh in the urban centers. Excluding the largest PCE utilities the average commercial customer paid $.31 per kwh for electricity.

The result of higher electricity costs, combined with lower average household incomes, is that households in PCE communities spend a larger share of their income on electricity and use less than households in urban Alaska even without the PCE adjustment. The monthly electric bill for the average residential PCE customer was $75 (after of the PCE adjustment) compared to $61 in Anchorage and $71 in Fairbanks. The average residential bill in Juneau--$84-- is higher because of some residential electric space heating in that community.

The annual residential electricity bill for the average residential PCE customer was $896, varying from a low of $188 to a high of $2,831. If we add to the average residential bill the cost that the average household pays for electricity indirectly to support the electricity consumption of local community facilities, the annual bill for the typical household increases to $1,088. The average annual residential bill is 1.9 percent of the average household income in PCE communities compared to between 1.1 and 1.5 percent of household income in non-PCE communities.

The monthly residential use for the average residential PCE customer is 411 kwh, ranging from a low of 115 to a high of 850 kwh. Electricity use in urban Alaska is considerably higher. In Anchorage the average monthly use is 635 kwh. In Fairbanks, where the climate is more similar to that of most of rural Alaska, the average monthly use is 722 kwh. In Juneau it is 960 kwh.

An impression of the cost of electricity in PCE communities can be derived from a calculation of the monthly bill for the typical residential PCE customer at the fully published

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rate, based on the cost of generation, and the urban consumption level. If the typical PCE customer used 635 kwh in a month (the amount used by the average Chugach Electric Utility customer), his bill would be $178 compared to $61 for the urban consumer.

We have not surveyed rural residents to determine electricity use patterns, but a typical monthly consumption of 411 kwh could consist of some combination of the following major appliances, based on standard consumption ratings:\(^6\)

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Consumption (kwh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen Range</td>
<td>100 kwh</td>
</tr>
<tr>
<td>Freezer</td>
<td>100 kwh</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>100 kwh</td>
</tr>
<tr>
<td>Oil Fired Space Heater</td>
<td>60 kwh</td>
</tr>
<tr>
<td>Lighting</td>
<td>60 kwh</td>
</tr>
<tr>
<td>Television</td>
<td>40 kwh</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>460 kwh</strong></td>
</tr>
</tbody>
</table>

There has been a slight upward trend in electricity use per customer over time based on historical data from a sample of utilities (Figure 2.9). It may be that some of the increase is the result of more electricity intensive new residential construction, however we were unable to verify whether, for example, the appliances in new HUD housing require more electricity than those in older residences. In any event the PCE sales per customer are still generally much below the levels of urban utilities in Anchorage and Fairbanks.

There is a definite seasonality associated with electricity use in the PCE utilities as reflected by the monthly pattern of sales in two typical communities (Figure 2.10). Sales in the summer months may be less than half the level of sales in the winter. This corresponds to the coldest and darkest time of the year when people are spending the most time inside.

There is great variation in the size of the PCE utilities measured by annual sales (Figure 2.11). Utility sales in half the communities exceed 651,507 kwh and are less in half. The largest utility, Bethel Utilities, had sales in 1996 of 32,564,724 while the smallest, Telida, had sales of only 21,452. Cumulatively the 9 largest utilities accounted for more than half of the total sales of all the PCE utilities (Figure 2.12).\(^7\)

A final distinguishing feature of the PCE utilities is the large share of total sales to residential customers, particularly if we exclude the largest PCE utilities (Figure 2.13). The

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\(^6\) Provided by Alaska Village Electric Cooperative.

\(^7\) With the exception of the largest PCE utilities we found that many variables such as PCE per customer, share of revenues from PCE, residential share of total sales, and cost of generation were not correlated with size of utility.
Power Cost Equalization

small share of sales to commercial customers reflects the fact that the economic base in many of these PCE communities small and underdeveloped. As a consequence there is little commercial activity to help support the costs of electricity generation and other infrastructure needs in these communities. In the typical (median) PCE community 41 percent of kwh of sales go to residential customers. This percentage varies from a low of 11 percent for Bettles to a high of 85 percent for Tuluksak.
Power Cost Equalization

FIGURE 2.1 (part 1)

PCE COMMUNITIES
POPULATION (PART 1.)

Thousands

0 1 2 3 4 5

Bethel Utilities Corp Inc.
Unalaska Electric Utility
Maine John Utility System
Kokolik Electric Association
Cordova Electric Cooperative, Inc.
Healy Electric Cooperative, Inc. (Dillingham)
Craig
Nulato Electric Association, Inc
Haines Light & Power
Kake
Eskil
Kigluaik Energy, Inc.
Ewan
Black Rapids
Port Heiden
Ekuk
Ketchikan
Togiak
Pine Ridge
Eskine
Kwethluk, Inc.
Chenhale
gtulitna Electric (Fort Yukon)
Tahltan Bay Public Utility
Selawik
Gumbeq
Savoonga
Aliak
Anchorage
Unalakleet
Anvik
Arvak Light & Power Company, Inc.
Gustavus
Istiklal Electric Services
Warwick
Ekuk
Golovin, City of
Iliamna
Pilot Station
Toksook Bay
Atlin Lake Native Community Electric Co.
Nugssuaq Light & Power
Cl. Myers
Kalskag
Kipnek Light Plant
Nek.png
Kalskag
Nulato Electric Utility
Scammon Bay
Riv Muplug
Kiana
SNH Electric Cooperative
Docklands, City of
Haines Electric Power Company
Napako
Hoonah
Nuquak Electric Utility
Tolukuma Traditional Power Utility
Hawk's Light Plant (Chester)
Rufus
Takoma Power Company
Haines
St. Michael
Hagens
Napako Inc/Incorporated
Akutan Power Utilities
Tanana
Old Harbor
Amchitka
Levitt Kalskag
Tunutulaik Community Service Assn.
Marshfield
Russel Mission
Punaxulak Power Company (Kwig) (Eskil)
Tea
Anchorage Pass
Polly Cross
Eek
Kayak
Kwig Power Company (Kwig) (Eskil)
Teller Power Company
Anchorage Joint Utilities
FIGURE 2.1 (part 2)

PCE COMMUNITIES POPULATION (PART 2.)

Thousands

0 1 2 3 4 5

Breip Mission
Unquiuq Power Company (Alaska)
Qanuk, City of
Kaltag
Halsey
Goodnews Bay
Coffman Cove
Gulkana
Massacre
Mechanik
Grayling
Ruby, Civil
Kainantu
White Mountain Utilities
Pelton Utility Company
Shelikof
St. George Municipal Electric Utility
Hightower Power Plant
Upper Kalinag
Veneta Village Electric
Koliganek Village Council
Wrangell
Chippew Electric
Sheldon Point, City of
Far North Utilities (Central)
Alakaha Energy Systems (Mascot)
Galvin Power Utilities
Glotzo, Joint Utilities
Iglutskagaq Electric Company (Ngering)
Kukak Bay Village Council
Gustavius Electric Company
Husk
Frog Legs Power Company
Shagawa
Chignik Lake Electric Utility, Inc.
Purser Bay
Piruk Point
Larsen Bay Utility Company
Cehlak Valley
Port Heiden, City of
Ganada Light & Power
Goyulu, City of
Unalakleet
Yukon Electric Utility
Northway Power & Light
Tenakee Springs
Peters Bay, City of
Cyclops Utilities
Sleat
Clopek Creek
Kwok Luck Electric Cooperative
Schoofs Village Energy Systems
Elchok Electric
Baver Joint Utilities
Andraelt Electric Corporation (Nina)
Manley Utility Company
Mentasta
Atlin
Chevak
Hailay Point Village Council
Whale Pass
False Pass Electric Association
Tecin
Nelson Ligak Electric Cooperative, Inc.
Tchik Valley Electric Company
Atlin, City of
Hughes Power & Light
Atlin Power Company (Kal-la)
Tanana Electric Cooperative, Inc.
Flax Cove Electric Utility
Talkeenta Community Association
Chitina
Red Devil
China Electric Inc.
Healy Lake
Platinum Power Plant
Peda Bay Village Council
Hoonah
Hoonah Power Company (McKoon)
Bakas
Iglady Electric Company
Teekwa Village Utility
FIGURE 2.2 (part 1)

CUMULATIVE SHARE OF PCE POPULATION
BY UTILITY (PART 1.)

[Diagram showing cumulative share of PCE population by utility, with various utilities listed along the y-axis and percentage share along the x-axis.]
Power Cost Equalization Economic Significance

Figure 2.2 (part 2)

Cumulative Share of PCE Population by Utility (Part 2.)

PCE Community - Largest to Smallest
# FIGURE 2.3
CHARACTERISTICS OF THE TYPICAL PCE HOUSEHOLD AND COMPARISON TO NON-PCE COMMUNITIES

<table>
<thead>
<tr>
<th></th>
<th>PCE COMMUNITIES</th>
<th>NON-PCE COMMUNITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SUM / AVG</td>
<td>EXCLUDING LARGEST</td>
</tr>
<tr>
<td>Households (90)</td>
<td>18,737</td>
<td>11,593</td>
</tr>
<tr>
<td>Average Income Per HH (89)</td>
<td>$39,001</td>
<td>$31,733</td>
</tr>
<tr>
<td>Average Income Per HH (89)</td>
<td>$49,925</td>
<td>$66,507</td>
</tr>
<tr>
<td>Families (90)</td>
<td>13,827</td>
<td>8,938</td>
</tr>
<tr>
<td>Below Poverty with Children (90)</td>
<td>1,864</td>
<td>1,052</td>
</tr>
<tr>
<td>Below Poverty without Children (90)</td>
<td>254</td>
<td>662</td>
</tr>
<tr>
<td>% Below Poverty (90)</td>
<td>15.4%</td>
<td>20.9%</td>
</tr>
<tr>
<td>% of HH Income from Public Assistance (80)</td>
<td>20.0%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Annual Electric Bill / Res Cust (90)</td>
<td>$856</td>
<td>$728</td>
</tr>
<tr>
<td>Monthly Electric Bill / Res Cust (66)</td>
<td>$77</td>
<td>$51</td>
</tr>
<tr>
<td>Total Electric Cost / Res Cust (66)</td>
<td>$1,088</td>
<td>$1,050</td>
</tr>
<tr>
<td>Electric Bill Share of HH Income (66)</td>
<td>1.5%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Electric Cost Share of HH Income (66)</td>
<td>2.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Annual Use Per HH (90)</td>
<td>4,933</td>
<td>4,378</td>
</tr>
<tr>
<td>Monthly Use Per HH (90)</td>
<td>411</td>
<td>365</td>
</tr>
<tr>
<td>Residential Avg Rate $/kwh (60)</td>
<td>$0.18</td>
<td>$0.19</td>
</tr>
<tr>
<td>Commercial Avg Rate $/kwh (60)</td>
<td>$0.26</td>
<td>$0.31</td>
</tr>
<tr>
<td>Fuel Price (60)</td>
<td>$1.14</td>
<td>$0.71</td>
</tr>
<tr>
<td>Residential Share of Sales (60)</td>
<td>42.9%</td>
<td>10.9%</td>
</tr>
</tbody>
</table>

LARGEST PCE UTILITIES EXCLUDED
- TOK
- HUNTER
- HOME
- NUNIVAK (EKLUTNAN)
- ORANG
- SKAGWAY
- BETHEL
- CORSAUS
- HAINES
- UMI

AVERAGE FOR DEMOGRAPHIC DATA IS ACROSS HOUSEHOLDS
AVERAGE FOR ELECTRICITY USE DATA IS ACROSS RESIDENTIAL CUSTOMERS (NOT THE AVERAGE UTILITY)
ELECTRIC COST PER RESIDENTIAL CUSTOMER INCLUDES RESIDENTIAL, COMMUNITY FACILITIES, AND OTHER
ELECTRIC BILL AND USE DATA BASED ON 134 PCE COMMUNITIES WITH COMPLETE RECORDS FOR 1996.

SOURCE: 1990 CENSUS
PCE RECORDS FOR UTILITIES WITH COMPLETE REPORTS FOR FY 1996.
FIGURE 2.5 (part 2)

PCE COMMUNITIES IN 1989
% HH BELOW POVERTY INCOME (PART 2.)
## FIGURE 2.6

### ALASKA ELECTRIC UTILITIES

#### REGIONAL ANALYSIS

<table>
<thead>
<tr>
<th>REGION</th>
<th>RESIDENTIAL</th>
<th></th>
<th></th>
<th>RESIDENTIAL</th>
<th></th>
<th></th>
<th>RESIDENTIAL</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>SALES</td>
<td>REVENUES</td>
<td>COST PER KWH</td>
<td>SALES</td>
<td>REV</td>
<td>CUST</td>
<td>SALES</td>
<td>REV</td>
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<tr>
<td>SOUTH EAST</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PCE</td>
<td>12</td>
<td>274,742</td>
<td>$27,790</td>
<td>20,849</td>
<td>$0.10</td>
<td></td>
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<tr>
<td>NO</td>
<td>6</td>
<td>251,874</td>
<td>$22,539</td>
<td>22,794</td>
<td>$0.09</td>
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<tr>
<td>SOUTH CENTRAL</td>
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<tr>
<td>PCE</td>
<td>5</td>
<td>1,091,222</td>
<td>$114,847</td>
<td>137,429</td>
<td>$0.10</td>
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<tr>
<td>NO</td>
<td>9</td>
<td>1,085,283</td>
<td>$112,893</td>
<td>135,222</td>
<td>$0.10</td>
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<tr>
<td>YUKON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PCE</td>
<td>37</td>
<td>256,755</td>
<td>$30,341</td>
<td>32,998</td>
<td>$0.11</td>
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<tr>
<td>NO</td>
<td>2</td>
<td>251,732</td>
<td>$24,736</td>
<td>29,036</td>
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<tr>
<td>ARCTIC / NORTHWEST</td>
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</tr>
<tr>
<td>PCE</td>
<td>31</td>
<td>38,260</td>
<td>$8,838</td>
<td>6,229</td>
<td>$0.23</td>
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<td>NO</td>
<td>2</td>
<td>8,307</td>
<td>$740</td>
<td>1,257</td>
<td>$0.68</td>
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<tr>
<td>SOUTHWEST</td>
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<td></td>
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<tr>
<td>PCE</td>
<td>44</td>
<td>40,091</td>
<td>$11,519</td>
<td>7,365</td>
<td>$0.29</td>
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<tr>
<td>NO</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>ERR</td>
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<tr>
<td>STATE</td>
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<td></td>
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<td></td>
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<tr>
<td>PCE</td>
<td>129</td>
<td>1,711,770</td>
<td>$193,033</td>
<td>210,870</td>
<td>$0.11</td>
<td></td>
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<tr>
<td>NO</td>
<td>19</td>
<td>1,587,876</td>
<td>$160,968</td>
<td>189,309</td>
<td>$0.10</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### NON-PCE COMMUNITIES

- JUNEAU: ANCHORAGE CEA
- KETCHIKAN: ANCHORAGE AMLP
- METLAKATLA: GLENNALLEN
- PETERSBURG: HOMER/SELODIAV
- SITKA: KODIAK/PORTLIONS
- WRANGELL: PALMER
- JUNEAU: SEWARD
- KETCHIKAN: VALDEZ
- METLAKATLA: FAIRBANKS GVEA
- PETERSBURG: FAIRBANKS FMUS (NOW COMBINED WITH GVEA)
- SITKA: BARROW
- WRANGELL: DEADHORSE


Revenues are based on full published rates.
FIGURE 2.7 (part 1)

PCE COMMUNITIES
AVERAGE PRICE OF DIESEL (PART 1.)

$0.00  $0.50  $1.00  $1.50  $2.00

- Nushagak Electric Cooperative, Inc. (Dillingham)
- Tok (includes Dol Leen)
- Naknek Electric Association, Inc.
- Nome Joint Utility System
- Far North Utilities (Central)
- Craig
- Haines Light & Power
- Unalaska Electric Utility
- Kake
- King Cove, City of
- Monck's
- Skagway
- Haines
- Colton
- Northway Power & Light
- Hollis
- False Pass Electric Association
- Chignik Electric
- Eagle Power Company
- Kake
- Thorne Bay Public Utility
- Angoon
- Healy Lake
- Chilkat Valley
- Kuskokwim Electric Association
- Cordova Electric Cooperative, Inc.
- Hoorn
- Alaska Power Company (Kake)
- Unalaska Village Electric Cooperative
- Coffman Cove
- Circle Utilities
- Atka Electric Utility
- Manley Utility Company
- China Electric Inc.
- Hydaburg
- Yukon Power
- Bethel
- Sand Point Electric Company
- Tonulkulak Community Service Assn.
- Talkeetna
- Kwig Power Company (Kwigillingok)
- St. Michael
- Seldovia
- White Mountain Utilities
- Katvik
- Guyvn
- Mountain Village
- Anvik
- Scanning Bay
- Hooper Bay
- Shatto Park
- Elam
- Tuenauk
- Emmonak
- Russian Mission
- Holy Cross
- MARSHALL
- Makanak
- Mekoryuk
- Pilot Station
- Rio Grande
- St. Mary's
- Nunapitchuk
- Tonloski Bay
- Quinlisk, City of
- Royuk
- Chevak
- Togiak
- Ways Pass
- Lower Elabug
- Tentacles Springs
- Saltwater, City of
- Goodnews Bay
- New Stuyahok
- Qualapik
- Eek
- Shagak
- Umnak Power Company (Nikolski)
- Perryville, City of
- Gustavus Electric Company
- Anderson Electric Corporation (Kiska)
- H&N Electric Cooperative
- Tulsequah Traditional Power Utility

(pcerep2.wpd) November 16, 1998 2.18
### Power Cost Equalization Economic Significance

**FIGURE 2.7 (part 2)**

#### PCE COMMUNITIES

**AVERAGE PRICE OF DIESEL (PART 2)**

<table>
<thead>
<tr>
<th>$0.00</th>
<th>$0.50</th>
<th>$1.00</th>
<th>$1.50</th>
<th>$2.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brevig Mission</td>
<td>Akuliktalik Electric Utility</td>
<td>Nerteqik Light Plant (Chevak)</td>
<td>Pelton Utility Company</td>
<td>Hunga Town</td>
</tr>
<tr>
<td>generator Plant (Fort Yukon)</td>
<td>St. Paul Municipal Electric Utility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PCE COMMUNITY-LOWEST TO HIGHEST**

- Brevig Mission
- Akuliktalik Electric Utility
- Nerteqik Light Plant (Chevak)
- Pelton Utility Company
- Hunga Town
- Unagvik Power Company (Neotsuk)
- Old Harbor
- Aniak Light & Power Company, Inc.
- Kotlik Electric Services
- Atka Light & Power Company
- St. George Municipal Electric Utility
- Hughes Power & Light
- Tanalian Electric Cooperative, Inc.
- Chevak Electric Company

**PCE COMMUNITY-HIGHEST TO LOWEST**

- Brevig Mission
- Akuliktalik Electric Utility
- Nerteqik Light Plant (Chevak)
- Pelton Utility Company
- Hunga Town
- Unagvik Power Company (Neotsuk)
- Old Harbor
- Aniak Light & Power Company, Inc.
- Kotlik Electric Services
- Atka Light & Power Company
- St. George Municipal Electric Utility
- Hughes Power & Light
- Tanalian Electric Cooperative, Inc.
- Chevak Electric Company

---

November 16, 1998
FIGURE 2.8 (part 1)

PUBLISHED RESIDENTIAL RATE BEFORE PCE (PART 1.)

CENTS PER KWH

Power Cost Equalization

Economic Significance

(pce rep2.wpd) November 16, 1998 2.20
FIGURE 2.9

RESIDENTIAL SALES PER CUSTOMER
ANNUAL KWH

- MIYAZAKI
- ANCHORAGE
- FAIRBANKS
- GREATER ANCHORAGE
- FORT WAIN
- GALENA
- COOT BAY

RESIDENTIAL SALES PER CUSTOMER
ANNUAL KWH

- GROSSE ISLE
- BONNIEBROOK
- MIKRINISOK
- MCGRA
- INUGIG
- NEWTON
- PEER BAY
- FAIRBANKS
- GREATER ANCHORAGE

RESIDENTIAL SALES PER CUSTOMER
ANNUAL KWH

- BANGPOINT
- COOKIN IBAY
- TULLIKSAN
- FAIRBANKS
- GREATER ANCHORAGE

November 16, 1998
FIGURE 2.10

MONTHLY ELECTRICITY SALES

KWH Thousands

MONTH

KOBUK  IGIUGIG
FIGURE 2.11 (part 1)

ANNUAL KWH SALES (PART 1.)

KWH SOLD
Millions

0 10 20 30

Bathal Utilities Corp Inc
Unalaska Electric Utility
Nome Joint Utility System
Cordova Electric Cooperative, Inc.
Kotzebue Electric Association
Navrak Electric Association, Inc.
Dillingham
Nushagak Electric Cooperative, Inc.
Homer Light & Power
Tok (includes Dot Lihot)
Seward
Galena, City of
Yakutat Power
Naknek
Hoonah
St. Paul Municipal Electric Utility
Unalaska Valley Electric Cooperative
Bayview
Unalaska
Sand Point Electric Company
GEK, Inc. (Cold Bay)
McGrath Light & Power
King Cove, City of
Pelican Utility Company
St. Mary's
Thorne Bay Public Utility
Adak
Gwaltney Zhe weather electric cooperative, inc.
Anchorage Light & Power Company, Inc.
Martin Village
Kupreanof
Aniak
Emmonak
Atqasuk
NHK Electric Cooperative
Nunapigiak
Yupik
Northway Power & Light
Naknek
Hopple Bay
Point Lay
Hyderburg
Kanay
Tanana Power Company
Gustavus Electric Company
Sadie-Ark
Ninilchik
Comolik
Kipnuk Light Plant
Coffman Cove
Skilumref
Kiana
Nondalton
Alakanuk
Seakeena
Stebbins
St. George Municipal Electric Utility
Shungnak
Pitit Station
Onshagak
Amalik
Toksook Bay
Nutk,
Kuskusk, Inc.
New Stuyack
Kalskag
Teter Power Company
Scarnoon Bay
Lower Kalskag
Manotsok Power Company
Brevins
Marshall
SL. Michael
Kasilgin Electric Company
Egegik Light & Power Co.
Kipslb
Port Heiden, City of
Guinard, City of
Ellen
Kumak
Old Harbor
Melagak
Eagle Power Company

(pcerep2.wpd) November 16, 1998 2.24
FIGURE 2.11 (part 2)

ANNUAL KWH SALES (PART 2.)

KWH SOLD
Millions

0 10 20 30

Shaktoolik
Akhiok Power Utilities
Chignik Electric
Holly's
Kaltag
Tunaliulak Community Service Assn.
Alakanak Native Community Electric Co.
Black
White Mountain Utilities
Huelsk
Buckland, City of
Russo's I-B.'
Ruby, City of
Napaskiak Native Power Company
Eel
Arakulak Energy Systems (Alaska)
Goodness Bay
Tanalian Electric Cooperative, Inc.
Nikiski Light Plant (Eklutna)
Graig
Larsen Bay Utility Company
Dillingham Joint Utilities
St. Marys
Atmautluak Joint Utilities
Levock Electric Cooperative
Igloolik Electric Company (Igloolik)
Viscous Village Electric
Far North Utilities Cooperative
Kuparuk Electric Utility
Sakha
Puvungna Power Company (Kongiganak)
Golden Power Utilities
Coyote Village
Kekp Power Company (Kokolik)
Takotna Electric Utility
Pilot Point Village Council
Sheridan Point, City of
tenakee Springs
Nelson Lagoon Electric Cooperative, Inc.
Nivel Light & Power
Anvik
Kenai, City of
Elfin Cove Electric Utility
Akutan Electric Utility
Melvin Utility Company
Kikilateri Joint Council
Nightmute Power Plant
Unalaska Power Company (Unalaska)
Chignik Lake Electric Utility, Inc.
Avangig
Talkeetna
Andiulak Electric Corporation (Untuk)
Coffeetown
Chief's Electric Inc.
Shageluk
Baker Joint Utilities
Akhiok, City of
White Pass
Cooked Creek
Chinook Bay
Teekale Community Association
Stevens Village Energy Systems
Shaw Electric
Tulikack Traditional Power Utility
Kolafak Village Council
Towned Canyon
Kokulak Valley Electric Cooperative
Fake Pass Electric Association
Sheets Cove
Hughes Power & Light
Chevakhuk
Igloolik Electric Company
Kasaan
Pietz Electric Utility
Allen Power Company (Seldovia)
Red Devil
Stony River
Kayak, City of
Unalaska Power Company (Hokohilo)
Kluane Power Plant
Hekia Lake
Yeela Village Utility

(pecrep2.wpd) November 16, 1998 2.25
FIGURE 2.12 (part 1)

CUMULATIVE SHARE OF PCE UTILITY SALES BY UTILITY (PART 1.)

Bethel Utilities Corp. Inc.
Unalaska Electric Utility
Nome Joint Utility System
Cordova Electric Cooperative, Inc.
Kaltabore Electric Association
Nanok Electric Association, Inc.
Craig
Nushagak Electric Cooperative, Inc. (Punggee)
Holmes Light & Power
Tol (Includes Del (Lake)
Skagway
Gulkana, City of
Yahualik Power
Klawock
Hoonah
St. Paul Municipal Electric Utility
Unalaska Valley Electric Cooperative
Putid Hope
Haines
Sand Point Electric Company
DNL, Inc. (Cord Bay)
MCBlight & Power
King Cove, City of
Pelican Utility Company
St. Mary's
Thorne Bay Electric Utility
Anaktuvuk Pass
Green Bay-See Utilities (Port Yaks)
Avaki Light & Power Company, Inc.
Mounts Waage
Hoonah
Angoon
Emmonak
Afognak
HT-N Electric Cooperative
Nondalton
Togiak
Northway Power & Light
Kake
Hopper Bay
Point Lay
Huskim
Gustine
Tanana Power Company
Gustavas Electric Company
Selawik
Niook
Chenega
Kipuk Light Plant
Cleehorn Cave
Shumagin
Nama
Hoonah
Atlatikuk
Savorgna
Selbiksk
St. George Municipal Electric Utility
Shungnak
Point Saloon
Guinagaks
Aniak
Tatulik Bay
Rubia
Kwethluk, Inc.
New Stuyak
Kivalina
Teter Power Company
Scammon Bay
Lower Kivalina
Nanokah Electric Company
Klathis
Marshik
St. Michael
Kootk Electric Service
Egegik Light & Power Co.
Kwayak
Port Heiden, City of
Ocotsik, City of
Eli
Taninak
Old Harbor
Eklutn
Eagle Power Company

PCE COMMUNITY—LARGEST TO SMALLEST

0% 20% 40% 60% 80% 100%

November 16, 1998
CUMULATIVE SHARE OF PCE UTILITY SALES BY UTILITY (PART 2.)

0% 20% 40% 60% 80% 100%

PCE COMMUNITY, LARGEST TO SMALLEST

Shishaldin
Akuyel Power Utilities
Chignik Electric
Holy Cross
Kiang
Uintah Valley Community Service Assn.
Alluchak Native Community Electric Co.
Meto
White Salmon Utilities
Huskia
Buddell, City of
Russian Mission
Ruby, City of
Napaskik Irving Power Company
Nikolai
Napaskik Energy Systems (Akula)
Goonews Bay
Tenas Electric cooperative, Inc.
Nenana Light Plant (Chevak)
Grayling
Larsen Bay Utility Company
Dawode Joint Utilities
Wales
Aleknagik Joint Utilities
Levock Electric Cooperative
Ipiutak Electric Company (Cook Inlet)
Venetie Village Electric
Far North Utilities (Dentak)
Napaskik Electric Utility
Bering Strait
Pavelsk Power Company (Kolalut)
Golovin Power Utilities
Chkal Valley
Kwig Power Company (Wildegish)
Talkeetna Electric Utility
Hope
Plot Point Village Council
Sheehan Point, City of
Tunki Springs
Nelton Lagoon Electric Cooperative, Inc.
Kluane Light & Power
Airk
Pavelsk, City of
Elsa Cove Electric Utility
Alaska Electric Utility
Manley Utility Company
Koyukuk Village Council
Kotzebue Point Power Plant
Unalakle Power Company (Kutuk)
Chulitna River Electric Utility, Inc.
Metlakatla
Tennet
Andrualik Electric Corporation (Alaska)
Cuda Utilities
Chitina Electric Inc.
Shapuk
Reaver Joint Utilities
Aheek, City of
White Pass
Coughed Creek
Chinque Village
Talkeetna Community Association
Stevens Village Energy Systems
Clark Electric
Tuktoak Traditional Power Utility
Kolotna Village Council
Chisana
Koluk Valley Electric Company
Fates Pass Electric Association
Ulakalut
Haines Power & Light
Chitina Electric
Igigik Electric Company
Islets
Perry Bay Village Council
Alutiiq Power Company (Situs)
Port Dania
Stoney River
Wayakak, City of
Unalakle Power Company (Kolalut)
Platinum Power Plant
Healy Lake
Tektina Village Utility

November 16, 1998
2.27
FIGURE 2.13 (part 1)

PCE COMMUNITIES
RESIDENTIAL SHARE OF SALES (PART 1.)

0% 25% 50% 75% 100%

Bclues
Galena, City of
G&K Inc. (Cold Bay)
Unalaska Electric Utility
Pavel Bay
Atqahnuk
Nikinan Electric Association, Inc.
Sh epid Point, City of
Tamana Power Company
Anvik Pass
Craig
Pelican Utility Company
Northway Power & Light
Cordova Electric Cooperative, Inc.
Wasilla
Yakutat Power
Red Devil
Monteclair
Stevens Village Energy Systems
Seldovia
Veneta Village Electric
Sedempak
Talke Village Utility
Igulgiu Electric Company
Hughes Power & Light
St. George Municipal Electric Utility
Kake
Nugum
Platinum Power Plant
Egegik Light & Power Co.
Teller Power Company
Beale Utilities Corp Inc
St Mary's
McGugn Light & Power
Fair North Utilities (Central)
Kokut Valley Electric Coop
Koyuk, City of
Plath Electric
Nome Joint Utility System
pak (includes Dol Lame)
St. Paul Municipal Electric Utility
Allak Point Utilities
Brevig Mission
Gomedia Joint Utilities
Point Hope
Nushagak Electric Cooperative, Inc. (Killingburg)
Gwaltney's Isle Utilities (Port Valin)
Kotzebue Electric Association
Beaver Joint Utilities
Seldovia
Niksit Light & Power
Gmorth
Healy Lake
Talkeena Community Association
Homer
Chevak
Port Heiden, City of
Larsen Bay Utility Company
Stryke River
Kupupa
Ivanitchuk Electric Company (Ukert)
Ambilli
Umark Power Company (Nikjuk)
Kotzebue
Akait, City of
Leveock Electric Cooperative
St. Michael
Kake
Thorne Bay Public Utility
Ruby, City of
Alstam Electric Utility
Biaawak
Talke
Talke
Anvik
Twuulak
China Electric Inc.
Graham
Akiak
Alaskan Energy Systems (Alaska)
Huluta
Edna Cove Electric Utility
Dalton Power Utilities
Unalakleet Valley Electric Cooperative
Alaska Power Company (Ketchikan)
White Mountain Utilities
Cook Inlet, City of
Manley Utility Company
Kokuk
FIGURE 2.13 (part 2)

PCE COMMUNITIES
RESIDENTIAL SHARE OF SALES (PART 2.)

<table>
<thead>
<tr>
<th>Community</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haines Light &amp; Power</td>
<td></td>
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<tr>
<td>Aniak Light &amp; Power Company Inc.</td>
<td></td>
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<tr>
<td>Russian Mission</td>
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<tr>
<td>Ketchikan</td>
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<td>Sitkalidak</td>
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<td>Selawik</td>
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<tr>
<td>Upper Kalskag</td>
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<td>City Utilities</td>
<td></td>
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<tr>
<td>Sand Point Electric Company</td>
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<tr>
<td>Homestuck</td>
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<tr>
<td>Reklusk</td>
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<td>Chevak Bay</td>
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<td>Emmonsack</td>
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<tr>
<td>Marshall</td>
<td></td>
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<tr>
<td>Kakekuk, Inc.</td>
<td></td>
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<tr>
<td>Outalake, City of</td>
<td></td>
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<tr>
<td>Mountain Village</td>
<td></td>
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<tr>
<td>Tanana Electric Cooperative, Inc.</td>
<td></td>
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<tr>
<td>Russian Mission</td>
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<tr>
<td>Power Company</td>
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<td>Andreans Electric Corporation</td>
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<tr>
<td>Whole Pass</td>
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<td>Puyallup, City of</td>
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<td>Kiana</td>
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<td>Hooper Bay</td>
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<tr>
<td>H-N Electric Cooperative</td>
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<td>Pilikas Point</td>
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<td>Wales</td>
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<td>Elim</td>
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<td>Nunallek</td>
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<td>Shaktoolik</td>
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<td>Italik</td>
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<td>Tuskoolik Bay</td>
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<tr>
<td>Eagle Power Company</td>
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<td>Shagodlek</td>
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<tr>
<td>Gustvichuk</td>
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<tr>
<td>Heilvik</td>
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<tr>
<td>Tustumuluk Community Service, Inc.</td>
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<tr>
<td>Pedro Bay Village Council</td>
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<tr>
<td>Goodnews Bay</td>
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<tr>
<td>False Pass Electric Association</td>
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<td>Hoonah</td>
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<td>Quinhagak</td>
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<td>Coffman Cove</td>
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<td>Pit Bluffs</td>
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<tr>
<td>Old Harbor</td>
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<tr>
<td>Amwiliuk, Joint Utilities</td>
<td></td>
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<tr>
<td>Night Owl Power Plant</td>
<td></td>
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<tr>
<td>New Skwentna</td>
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<tr>
<td>Scammon Bay</td>
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<tr>
<td>Teller Electric Utility</td>
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<tr>
<td>Kiglua Light Plant</td>
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<td>Tenakee Springs</td>
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<td>Elle</td>
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<td>Chichagof</td>
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<tr>
<td>Pilot Point Village Council</td>
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<td>Burkeland, City of</td>
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<tr>
<td>Hydaburg</td>
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<tr>
<td>Kohikanuk Village Council</td>
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<td>Kili</td>
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<tr>
<td>Napakiak Incirigaq Power Company</td>
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<td>Angoon</td>
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<tr>
<td>Gustavus Electric Company</td>
<td></td>
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<tr>
<td>Other</td>
<td></td>
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<tr>
<td>Akiachak Native Community Electric Co.</td>
<td></td>
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<tr>
<td>Heilvik Electric Service</td>
<td></td>
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<tr>
<td>Lower Kalskag</td>
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<tr>
<td>Nelson Lagoon Electric Cooperative, Inc.</td>
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<td>Panumairi Power Company (Kongiganak)</td>
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<td>Ukusmat Power Company (Kotlik)</td>
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<tr>
<td>Hyak Electric Utility</td>
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<tr>
<td>Kotlik Village Council</td>
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<tr>
<td>Eklutna Lake Electric Utility, Inc.</td>
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<tr>
<td>Nailana Light Plant (Chefornak)</td>
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<tr>
<td>Kwig Power Company (Koliganek)</td>
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<tr>
<td>Eklutna Electric</td>
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<td>Korzan</td>
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<tr>
<td>Chilkat</td>
<td></td>
</tr>
<tr>
<td>Tulukuk Traditional Power Utility</td>
<td></td>
</tr>
</tbody>
</table>

(pccerep2.wpd) November 16, 1998 2.29
3. POWER COST EQUALIZATION PROGRAM EFFECTS

In FY 1996 $19,201,515 was disbursed under the Power Cost Equalization Program (PCE) to the 96 electric utilities serving 190 small rural Alaska communities. The amount received by each utility varied greatly, dependent upon a large number of factors including the level of sales of the utility and the cost of generation. Bethel Utilities received the largest distribution of $813,312 while the smallest went to Telida Village Utility, $5,467 (Figure 3.1).

The typical or median community disbursement (defined as the one for which half the communities served received larger and half received smaller amounts) was $71,363. The largest utilities received a large portion of the total disbursements. 15 utilities received one-third of the total amount disbursed.

The disbursement to the utility in the median community in 1996 was $1,059 per residential customer (Figure 3.2). This is the total disbursement to the utility in the community divided by the number of residential customers, but it exceeds the amount used to offset residential electricity costs by the portion of the PCE disbursement that was used to offset the costs of providing electricity to commercial and community facility customers. The annual disbursement ranged from a low of $63 per household for the Pelican Utility to a high of $2,733 for the Telida Village Utility.

The size of the payment depended upon the share of total utility sales that were eligible for the PCE disbursement. Eligible sales consist of portions of residential, community, and commercial sales, but exclude sales to government and any other entities (negligible). Residential and commercial sales are eligible up to 700 per month per customer so almost all residential sales are eligible and as well as a share of commercial sales determined by the average size of commercial customers. For large commercial customers such as the schools (included in the commercial class for purposes of PCE rather than in the government class which consists of state and federal customers) only a portion of monthly sales are eligible in most places because of their large monthly use. Most sales to community facilities are also eligible since they are eligible up to 70 kwh per month per person in the community.

The share of sales eligible for PCE is 57 percent for the typical utility and ranges from a low of 11 percent to a high of 95 percent (Figure 3.3). Generally the utilities in communities with larger amounts of commercial activity, or state and federal government offices, have lower eligibility percentages.

The disbursement per eligible kwh for the typical utility was $.22 in 1996 (Figure 3.4). This was the amount actually paid rather than the higher amount requested by the utility based on their reported costs. The difference between the amount requested and the amount actually paid was the combined result of slight under funding of the program and the disallowal of some utility costs used in the formula to estimate the disbursement per kwh. The disbursement ranged from a
low of $0.02 per eligible kwh for Pelican to a high of $0.40 in Sleetemute, Stony River, Red Devil, Crooked Creek, and Chuathbaluk.

The financial dependence of each PCE utility on PCE disbursements is measured by the share of total utility revenues contributed by the disbursement (Figure 3.5). The typical utility received 31 percent of its revenues from the PCE disbursement. The range of financial dependence using this measure was from a low of 5 percent for the city of Galena to a high of 60 percent for Akutan.

Most of the PCE eligible kwh sales go to households (Figure 3.6). For the typical utility 67 percent of PCE eligible sales are residential sales. The range is from a low of 33 percent for Telida to a high of 94 percent for Buckland. Furthermore the share of residential sales that is PCE eligible is 90 percent for the typical utility, ranging from a high of 100 percent in several smaller communities to a low of 40 percent in Tatitlek (Figure 3.7).

The disbursement for each eligible residential kwh sold was $0.22 for the typical utility ranging from a low of $0.02 in Pelican to a high of $0.41 in Crooked Creek, Stony River, Red Devil, Chuathbaluk, and Manley (Figure 3.8). The result of this disbursement was to reduce the residential rate on eligible kwh for the typical PCE utility from $0.41 down to $0.17. The rate adjustment varied by utility (Figure 3.9). The lowest average residential costs per kwh reported after the PCE adjustment were close to the $0.095 floor established for the PCE program, but nearly half of all communities continued to report average costs for residential kwh of over $0.20 after the adjustment, and several had average costs in excess of $0.30.

As a result of the PCE disbursements and residential rate adjustments, annual average residential electricity sales were higher than they otherwise would have been (Figure 3.10). The average residential customer of the typical PCE utility had annual purchases of 3,921 kwh. The range among the utilities was from a high of 10,201 in Cold Bay down to a low of 644 for Koyukuk.

Because of the PCE disbursements the monthly residential bill was lower than it otherwise would have been for the level of kwh purchased by the average household (Figure 3.11). With the PCE adjustment the average monthly residential bill for the typical PCE utility was $66. The average monthly residential bill for the typical PCE utility in the absence of the PCE adjustment, for the same number of kwh, would have been $121. The range of typical monthly residential bills for the PCE utilities was from a low of $16 for Beaver to a high of $236 for Cold Bay.

Monthly bills would be much higher at urban consumption rates. If average monthly residential consumption were 635 kwh (the average for Chugach Electric Association in Anchorage) the typical residential customer bill for the median PCE community would be $125 rather than $66. Furthermore if that typical customer were paying the full published rate that covered all costs, and were consuming 635 kwh, his monthly bill would have been $264 (Figure 3.12). This monthly bill, representing an urban level of consumption combined with a rural cost of electricity, ranges from a low of $95 to a high of $635 per month. In contrast the monthly bill
The resulting annual PCE disbursement for the average residential customer in the typical PCE utility was $696 (Figure 3.13). The range was from a low of $41 per residential customer in Pelican to a high of $1,725 in Chignik Lake. The PCE disbursement for the average community facility customer in the typical PCE community was $1,892. The PCE disbursement for the average commercial customer was $804. As one would expect there was considerable variation in these amounts by utility.

Most of the PCE disbursement directly benefits residential customers and community facilities. For the typical utility 87 percent of PCE eligible kwh were paid to those two types of customers (Figure 3.14). The range was from a low of 33 percent for Telida to a high of 99 percent for Pitkas Point.
FIGURE 3.1 (part 1)
PCE DISBURSEMENT BY UTILITY (PART 1.)

Thousands

$0 $200 $400 $600 $800

PCE COMMUNITY—HIGHEST TO LOWEST

Power Cost Equalization Economic Significance

(pcrep2.wpd) November 16, 1998 3.4
FIGURE 3.1 (part 2)

PCE DISBURSEMENT BY UTILITY (PART 2.)

Thousands

$0 $200 $400 $600 $800

St. George Municipal Electric Utility
Thorne Bay Public Utility
Ouzinkie, City of
Manokotak Power Company
Hydaburg
Ruby, City of
Punumag Power Company (Kongiganak)
Fair North Utilities (Central)
Russian Mission
Kaijuigmiut Village Council
Ipiutak Electric Company (Chevak)
White Mountain Utilities
Dinlleda Joint Utilities
Egegik Light & Power Co.
Levittown Electric Cooperative
Upper Kalskag
Napaskiak Electric Utility
Igiugig Mission
Point Hope
Cook's Creek
Shageluk
Nguluk Light & Power
Keklanik Village Council
Bethel
Nelson Lagoon Electric Cooperative, Inc.
Alaskan Joint Utilities
Circle Utilities
Lessen Bay Utility Company
Galvin Power Utilities
Tenakee Springs
Anch
Wol displacement
Nenana Light Plant (Chevak)
Chulitna
Piksi Point
Chignik Electric
Beaver Joint Utilities
Kalvak Valley Electric Company
Tanana Electric cooperative, Inc.
Shaktoolik
Kamalu
Akutan Electric Utility
Alatoona Pass
Tokoin Community Association
Fell Point Village Council
Fedex Bay Village Council
Shelok Point, City of
Verseka Village Electric
Alitak
Kalskag
Bucat, City of
Childs Oshock
Elfin Cove Electric Utility
Alpine Power Plant
Telon
Chinca Electric Inc.
Eskik River
Eskik Electric
Allak Power Utilities
Highland Power & Light
Andronof Electric Company (Kotzebue)
Ignigt Electric Company
Point Lay
False Pass Electric Association
Red Devil
Waisan
Albign Power Company (Bethel)
Mantua
Slevens Village Energy Systems
Unuk Power Company (Eluk)
Koahne Pass
Husky
Talinasak Traditional Power Utility
Talalsak Electric Utility
Healy Lake
Chenega Bay
Pot North, City of
Alith, City of
Pelcon Utility Company
Perrydale, City of
Kyuluk, City of
Putnam Power Plant
Takla Village Utility

(pcerop2.wpd) November 16, 1998 3.5
FIGURE 3.2 (part 1)

PCE PAYMENT DIVIDED BY RESIDENTIAL CUSTOMERS (PART 1.)

$0  $500  $1,000  $1,500  $2,000  $2,500

PCE COMMUNITY - LOWEST TO HIGHEST

Power Cost Equalization

November 16, 1998
FIGURE 3.2 (part 2)

PCE PAYMENT DIVIDED BY RESIDENTIAL CUSTOMERS (PART 2.)

- Manley Utility Company
- Nikolaik
- Tokotna Community Association
- Cleanline
- Goodnews Bay
- Glenn
t
- Kigf Power Company (Kaguyok)
- Piles Point
- Alaska
- Lutsen Bay Utility Company
- Stebbins
- Shaktoolik
- Pedro Bay Village Council
- Saint Mary's
- Unterak Power Company (Unterkah)
- Kobuk Valley Electric Company
- Russian Mission
- Hughes Power & Light
- Nikiski
- Lower Kalskag
- New Skyhook
- Anchor
- St. Michael
- Nulato
- Scammon Bay
- Holy Lake
- Tokak
- Nelsan Lagoon Electric Cooperative, Inc.
- Kalskag Village Council
- Kirkuk
- Nenana Station
- Old Harbor
- Kake
- Sand Point Electric Company
- Seldovia
- Kiguyok
- Upper Kalskag
- Gateway Electric Company
- Igiugig Electric Company
- Moose Electric Cooperative
- Nikiski Light & Power
- Hopeman
- Hoyak
- Duneside Joint Utilities
- Chandlafshak
- Tellk Power Company
- Garnett
- Kmart
- Napakok Intron Power Company
- Keno
- Unukusit Power Company (Menlo)
- Elm
- St. Mary's
- Shagatuk
- Holy Cross
- Tordrillo Bay
- mountain Village
- Hubber
- Oleake Utilities
- FNN Electric Cooperative
- Ginger
- Atigun Power Company (Koklet)
- Igriak Electric Company (Igriak)
- Emmonak
- Atigun Light & Power Company, Inc.
- Stony River
- Kiana
- McGrath Light & Power
- Phalves
- Shelly Lake
- Connell Creek
- Rainy
- GSK, Inc. (Cold Bay)
- Tenakee
- Chignik Lake Electric Utility, Inc.
- Naknek
- Shungnak
- Belles
- Red Owl
- Telda Village Utility

(pcerep2.wpd)

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3.7
Power Cost Equalization Economic Significance

FIGURE 3.3 (part 2)

PCE ELIGIBLE SHARE OF SALES (PART 2.)

[Graph showing the distribution of eligible sales share by various utilities.]

(peepep2.wpd) November 16, 1998 3.9
FIGURE 3.4 (part 1)

PCE PAYMENT PER ELIGIBLE KWH (PART 1.)

Pelican Utility Company
Slagnaw
Haines Light & Power
Unalaska Electric Utility
Nina Joint Utility System
Thorne Bay Public Utility
Point Hope
Woolwash
Retelwok
King Cove, City of
Mugdock
Craig
Atgouk
Hydaburg
Hills
Point Lay
Anaktuvuk Pass
Nalnek Electric Association, Inc.
Yakutat Power
Akhiok, City of
Port Hodies, City of
Kotzebue Electric Association
Nushagak Electric Cooperative, Inc. (Killinged)
St. Paul/Municipal Electric Utility
Tok (includes Tatla Lake)
Bethel Utilities Corp Inc.
Kenai Peninsula, City of
Cordova Electric Cooperative, Inc.
Saranas, City of
Byersland, City of
Aleut Power Utilities
Chicago Bay
Unalaska Valley Electric Cooperative
Eese Cove Electric Utility
Whale Pass
Nalikuak Light Plant (Dachene)
Colman Cove
Clapak Electric
Talkeet Electric Utility
Eiel Volunteer Electric
China Electric Inc.
Koyuk, City of
Woolwash Village Electric
Mentasta
Manolotak Power Company
Akutan Electric Utility
Northway Power & Light
Kanrik Light Plant
Dabud, City of
Gwiytoksia Zhen Utilities (Port Yuly)
False Pass Electric Association
Talkeetna Electric Cooperative, Inc.
Pit Point Village Council
Talvashak Tribal Power Utility
Sheldon Point, City of
St. George Municipal Electric Utility
Tanana Power Company
Ruby, City of
Stevens Village Energy System
Tenakee Springs
Kwethluk, Inc.
Sand Point Electric Company
Kiaia
Kiaia
Hoonah
Kasin
Chual Valley
Angoon
Tiiia
Kott Electric Services
National Electric Utility
Kogasna Power Plant
Egegik Light & Power Co.
Chocoahua
Almautuk Joint Utilities
Andream Electric Corporation (Kka)
Pawunna Power Company (Kondzagak)
Whitney Association Utilities
Long Bay Utility Company
Gebina Power Utilities
Tekokina Community Association
Kisko
Katio
Kuig Power Company (Kwiytoksia)
Power Cost Equalization

Economic Significance

FIGURE 3.4 (part 2)

PCE PAYMENT PER ELIGIBLE KWH (PART 2.)

Kwig Power Company (Kwigillingok)
Levock Electric Cooperative
Tunukuk Community Resource Assn.
McCarth Light & Power
Hughes Power & Light
Dredge Co., Inc. (Cold Bay)
Fair North Utilities (Coral)
North Light & Power
Geyzing
Unalakle Power Company (Allakak)
Akutan
Alaska Electric Systems (Atalta)
Nolato
St. Michael
Northeastern Electric Coop, Inc.
New Styx River
Teeklak
Stebens
Goodnews Bay
Eiel
Pilot Station
St. Mary's
Pitus Point
Emmonak
Mccoy
Tonvak
Shaktok
Alatanka
Koyuk
Smokman Bay
Pedro Bay Village Council
Quinhagak
Holy Cross
Chivak
Gmekel
Hooper Bay
Tekolik Bay
Fusian Mission
Onobuck Electric Plant
Eek
Old Harbor
Atvak
Igalshee Electric Coop. (Igiugig)
Ant Lit. Light & Power Company, Inc.
Mountaine Village
Waits
Lower Kittigak
Bering Mission
Savoonga
Diomede Joint Utilities
Kasigluk
Huslia
Nunapitchuk
Circle Utilities
Karluk
Upper Kittigak
Sagign Electric Company
Atvashak Native Community Electric Co.
Shageluk
Sheets
Kenon
Kigrinek Village Council
Eagle Power Company
Kimka
Alufa Power Company (Kutkaluk)
Teldis Village Utility
Kiska
Kobuk Valley Electric Company
Bever Joint Utilities
1-88-1 Electric Cooperative
Ungurag Power Company (Bothluk)
Nulato
Hays Lake Electric Company
Chungnak
Avuoluk
Kifka's Village Council
Melik
Gustavas Electric Company
TatUN Power Company
Chipek Lake Electric Utility, Inc.
Hays Lake
Unalakle Power Company
Stecher
Stony River
Red Devil
Crooked Creek
Chuathbaluk

(pcerel2.wpd) November 16, 1998 3.11
Power Cost Equalization

SHARE OF UTILITY REVENUES FROM PCE DISBURSEMENT (PART 1.)

Galena, City of
Port Heiden, City of
G&K, Inc. (Cold Bay)
Nome Joint Utility System
St. Paul Municipal Electric Utility
Yakutat Power
Nishnek Electric Association, Inc.
WeHIeight
Point Lay
Tea Island Electric Utility
Aleut Power Utilities
Anchorage Pass
Aigasoff
Point Hope
Thorne Bay Public Utility
Kaktovik
Parnyut, City of
Kotzebue Electric Association
Nualapik
Tek (includes Dot Line)
Angiak, City of
Battles
Kushagik Electric Cooperative, Inc. (Dillingham)
Tanana Power Company
Stevens Village Energy Systems
Egegik Light & Power Co.
Northway Power & Light
Hoonah
Unalakleet Valley Electric Cooperative
Chena River
Ruby, City of
Chignik Electric
Kanikmantak Power Company
Tanana Electric Cooperative, Inc.
Wilbur
Aniak Electric Corporation (Akia)
Teays Power Company
Aniak/Jux Joint Utilities
Gwichtiyik Native Utilities (Fort Yukon)
Halis
Veralce Village Electric
Turnagain Community Service Assn
Mentaska
Shungnak
McCracken Light & Power
Igiugig Electric Company
Koyukuk, City of
Pilot Point Village Council
Galvak
Fall Pass Electric Association
Sheldon Point, City of
Antak Light & Power Company, Inc.
St. Marys
Russian Mission
Nikolsuk
Atlikuk
Howshek
Nersuzak Light Plant (Chiefluma)
Stechert
Kalskag
Mountain Village
Levelock Electric Cooperative
Napaskiak Electric Utility
Hoonah
Chuathalak
China Electric Inc.
Lower Kalskag
FIGURE 3.5 (part 2)

SHARE OF UTILITY REVENUES FROM PCE DISBURSEMENT (PART 2.)

- Diomede Joint Utilities
- Tidds Village Utility
- Nighthawk Power Plant
- Savoonga
- Hughes Power & Light
- Red Devil
- Newlight Mission
- Togli
- Golovin Power Utilities
- Angoon
- Takoma Community Association
- Island Light & Power
- Shishmaref
- St Michael
- New Skyyehok
- Far North Utilities (Central)
- Koyuk
- Stansinan Bay
- Kiana
- Elfo Cove Electric Utility
- Shaglik
- Pilot Station
- Anvik
- Tunkana
- Tela
- Amber
- Selawik
- Igluling Electric Company (Selding)
- Nelson Lagoon Electric Cooperative, Inc.
- Enmonak
- Pebby Bay Village Council
- Alaskan Native Community Electric Co.
- Selman
- Tottok Bay
- Allakaket Energy Systems (Alaska)
- Vvales
- Oorhhagin
- Eek
- Stony River
- MAN Electric Cooperative
- Sand Point Electric Company
- Kpinta Light Plant
- Marsh
- Chuitna Valley
- Haise
- Nolak
- Umask Power Company (WildTig)
- Chuska
- Nulato
- Kwig Power Company (Kwigillingok)
- Ekvok Electric
- Noorvok
- Mentac Utility Company
- Goodnews Bay
- Em
- Tenake Springs
- Sintag
- Holy Cross
- Colod Creek
- Beaver Coast Electric
- Atig Power Company (KanuA)
- Puvungna Power Company (Kangigana)
- Grayling
- Minto
- Kasaan
- Chuathbaluk
- Eagle Power Company
- Old Harbor
- Kekha Electric Services
- Umbigu Power Company (Kivali)
- Gustavus Electric Company
- Holy Lake
- Shagakik
- Akutan Electric Utility

PCE COMMUNITY: LOWEST TO HIGHEST

November 16, 1998

3.13
### Power Cost Equalization Economic Significance

#### FIGURE 3.6 (part 2)

**RESIDENTIAL % OF TOTAL ELIGIBLE KWH (PART 2.)**

<table>
<thead>
<tr>
<th>Community</th>
<th>Residential % of Total Eligible KWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Harbor</td>
<td>40%</td>
</tr>
<tr>
<td>Hoyan</td>
<td>60%</td>
</tr>
<tr>
<td>Kalbask Village Council</td>
<td>80%</td>
</tr>
<tr>
<td>Ariania</td>
<td>100%</td>
</tr>
<tr>
<td>Holy Cross</td>
<td>40%</td>
</tr>
<tr>
<td>Minto</td>
<td>60%</td>
</tr>
<tr>
<td>Chuskus</td>
<td>80%</td>
</tr>
<tr>
<td>Goodnews Bay</td>
<td>100%</td>
</tr>
<tr>
<td>Otis, City of</td>
<td>40%</td>
</tr>
<tr>
<td>Seville</td>
<td>60%</td>
</tr>
<tr>
<td>Nome</td>
<td>80%</td>
</tr>
<tr>
<td>Bethel</td>
<td>100%</td>
</tr>
<tr>
<td>Nome Joint Utility System</td>
<td>40%</td>
</tr>
<tr>
<td>Skidawa</td>
<td>60%</td>
</tr>
<tr>
<td>Agulik</td>
<td>80%</td>
</tr>
<tr>
<td>Streetmute</td>
<td>100%</td>
</tr>
<tr>
<td>Lower Kokay</td>
<td>40%</td>
</tr>
<tr>
<td>Tanatar Electric Cooperative, Inc.</td>
<td>60%</td>
</tr>
<tr>
<td>Nondely Power &amp; Light</td>
<td>80%</td>
</tr>
<tr>
<td>Tassell Electric Utility</td>
<td>100%</td>
</tr>
<tr>
<td>Grand Bay</td>
<td>40%</td>
</tr>
<tr>
<td>Kuskokvik</td>
<td>60%</td>
</tr>
<tr>
<td>Kotzebue Electric Association</td>
<td>80%</td>
</tr>
<tr>
<td>Homer, City of</td>
<td>100%</td>
</tr>
<tr>
<td>Kake</td>
<td>40%</td>
</tr>
<tr>
<td>Port Helen</td>
<td>60%</td>
</tr>
<tr>
<td>Port Heale</td>
<td>80%</td>
</tr>
<tr>
<td>Igiugig</td>
<td>100%</td>
</tr>
<tr>
<td>Chitina</td>
<td>40%</td>
</tr>
<tr>
<td>Port Wood</td>
<td>60%</td>
</tr>
<tr>
<td>Prince William Sound</td>
<td>80%</td>
</tr>
<tr>
<td>Kiana</td>
<td>100%</td>
</tr>
<tr>
<td>Yakutat Power Plant</td>
<td>40%</td>
</tr>
<tr>
<td>Eagle Power Company</td>
<td>60%</td>
</tr>
<tr>
<td>Atka Native Community Electric Co.</td>
<td>80%</td>
</tr>
<tr>
<td>Siletz Electric Company</td>
<td>100%</td>
</tr>
<tr>
<td>Angoon</td>
<td>40%</td>
</tr>
<tr>
<td>Napiskvik Natives Power Company</td>
<td>60%</td>
</tr>
<tr>
<td>Port Heale Village Council</td>
<td>80%</td>
</tr>
<tr>
<td>Tenake Shallow Water Service, Inc.</td>
<td>100%</td>
</tr>
<tr>
<td>Nome Lagoon Electric Cooperative, Inc.</td>
<td>40%</td>
</tr>
<tr>
<td>Bethel Utilities Corp.</td>
<td>60%</td>
</tr>
<tr>
<td>Rolla Electric Services</td>
<td>80%</td>
</tr>
<tr>
<td>Coffman Cove</td>
<td>100%</td>
</tr>
<tr>
<td>Aurora Light &amp; Power Company, Inc.</td>
<td>40%</td>
</tr>
<tr>
<td>Rolla Idaho</td>
<td>60%</td>
</tr>
<tr>
<td>Chignik Lake Electric Utility, Inc.</td>
<td>80%</td>
</tr>
<tr>
<td>Egegik Bay</td>
<td>100%</td>
</tr>
<tr>
<td>Unukpik Bay</td>
<td>40%</td>
</tr>
<tr>
<td>Tok (includes Ot Lake)</td>
<td>60%</td>
</tr>
<tr>
<td>New Stuyahok</td>
<td>80%</td>
</tr>
<tr>
<td>Chevak Bay</td>
<td>100%</td>
</tr>
<tr>
<td>Nootka Bay</td>
<td>40%</td>
</tr>
<tr>
<td>Nightmute Power Plant</td>
<td>60%</td>
</tr>
<tr>
<td>Russian Mission</td>
<td>80%</td>
</tr>
<tr>
<td>Unquuna Power Company (Kuskokvik)</td>
<td>100%</td>
</tr>
<tr>
<td>Kaiyuk</td>
<td>40%</td>
</tr>
<tr>
<td>Esk</td>
<td>60%</td>
</tr>
<tr>
<td>Ekwik Electric</td>
<td>80%</td>
</tr>
<tr>
<td>Peryvile, City of</td>
<td>100%</td>
</tr>
<tr>
<td>Newtok</td>
<td>40%</td>
</tr>
<tr>
<td>Kemish, Inc.</td>
<td>60%</td>
</tr>
<tr>
<td>Point Nuga</td>
<td>80%</td>
</tr>
<tr>
<td>Teller</td>
<td>100%</td>
</tr>
<tr>
<td>Kwix Power Company (Kwix)</td>
<td>40%</td>
</tr>
<tr>
<td>Kugjoek Village Council</td>
<td>60%</td>
</tr>
<tr>
<td>Atmautluak Joint Utilities</td>
<td>80%</td>
</tr>
<tr>
<td>Tubachak Transmission Power Utility</td>
<td>100%</td>
</tr>
<tr>
<td>Tofolak Light Plant (Chinook)</td>
<td>40%</td>
</tr>
<tr>
<td>Napassak Electric Utility</td>
<td>60%</td>
</tr>
<tr>
<td>Cathut Variety</td>
<td>80%</td>
</tr>
<tr>
<td>Buckland, City of</td>
<td>100%</td>
</tr>
</tbody>
</table>

November 16, 1998

3.15
FIGURE 3.7 (part 2)

% RESIDENTIAL KWH PCE ELIGIBLE (PART 2.)

0% 20% 40% 60% 80% 100%

[Diagram showing various utilities and their percentage of residential KWH eligible for PCE]

Power Cost Equalization Economic Significance

Nelson Inlet Electric Cooperative, Inc. (Ongay, Anchorage)
Northern Light Electric Cooperative, Inc.
Talkeetna Electric Cooperative, Inc.
Alaska Power Company
Chugiak Cordova Electric Cooperative
I-N-N Electric Cooperative
Stevens Village Energy Systems
Tusitala Community Service Area, Inc.
North Slope Electric Cooperative, Inc.
Kokhanok Electric Cooperative
Sawyer Electric Cooperative
Kuskokwim Power Plant
Dillingham Power Plant
Shagovik Power Plant
Atlin Power Plant
North Slope Cooperative
Nita Power Plant
Talkeetna Joint Energy System
Kenai Peninsula Borough
North Peninsula Electric Cooperative
St. Mary's Electric Utility
Potter Electric Utility
Walden Electric Utility
Eagle River Electric Utility
Skagway Electric Utility
Kake Electric Utility
Hornsby Electric Utility
Kasilof Electric Utility
Ninilchik Electric Utility
Cooperative
St. Paul Municipal Electric Utility
King Cove, City of
Port Heiden, City of
GAK, Inc., Cold Bay
Talkeetna Electric Utility

(pecerep2.wpd) November 16, 1998 3.17
FIGURE 3.8 (part 2)

RESIDENTIAL PCE DEDUCTION PER ELIGIBLE KWH (PART 2.)

PCE COMMUNITY—LOWEST TO HIGHEST

- Unalak Power Company (Niwot)
- Goodnews Bay
- Graying
- Chevak
- Togak
- Tunkan Community Service Area
- McGrath Light & Power
- Turtan
- GAK, Inc. (Cold Bay)
- Eskie
- St. Mary's
- Moo Point
- Igigik Electric Company
- Umnak
- Russian Mission
- Savenagak
- St. Michael
- Plak Station
- Shobdon
- Quinhagak
- Nulato
- Fort North Utilities (Central)
- Naknek
- Slategolay
- New Saremak
- Upper Kitlting
- Table Rock Bay
- Lower Kitilting
- Old Harbor
- Nelson Lagoon Electric Cooperative, Inc.
- Breng Mission
- Bear
- Kiksya
- Manypatshik
- Elk
- Circle Utilities
- Shagtoo
- Amak Light & Power Company, Inc.
- Platinum Power Point
- Hopper Bay
- Naknek
- Holy Cross
dunr
- Popalay Village Council
- Kwig Power Company (Kwigatook)
- Diomede Joint Utilities
- Enmonak
- Leif Erikson Electric Cooperative
- Igniting Electric Company (Greenin)
- Naknek
- Alaska Energy Services (Naknek)
- Wales
- Stebbins
- Hughes Power & Light
- Eagle Power Company
- Malek
- Selvak
- Chinook Lake Electric Utility, Inc.
- Klhoka
- Hoovak
- Kukpuk Village Council
- Beaver Joint Utilities
- Kake Village Electric Cooperative
- Nunivak Electric Cooperative
- Atikai Power Company (Nuniv)
- Uncooking Power Company (Nuniv)
- Alaska Electric Cooperative, Inc.
- Gustave Electric Company
- Aniak
- Shungnak
- Knik
- Hoovak
- Northern Light
- Telfer Power Company
- Telda Village Utility
- Nuplak, Ivington Power Company
- Grayd Creek
- Stony River
- Red Dot
- Crooked Lake
- Sleetlake
- Unakie Utility Company

0 10 20 30 40

CENTS PER KWH

November 16, 1998

3.19
FIGURE 3.9 (part 1)

AVERAGE RESIDENTIAL ELECTRICITY RATE BEFORE AND AFTER PCE (PART 1.)

CENTS PER KWH

November 16, 1998
FIGURE 3.9 (part 2)

AVERAGE RESIDENTIAL ELECTRICITY RATE BEFORE AND AFTER PCE (PART 2.)

CENTS PER KWH
0 20 40 60

Chisokhina
Pleát
Anchorage
Akaitalk Light & Power Company, Inc.
Parachute Utility (Kivalina)
Golden Power Utilities
Aklavick
Belvics
Larsen Bay Utility Company
Hoonah Bay
Nome
Skraeling Bay
Thane Bay Public Utility
Tananai Electric cooperative, Inc.
Mallikredo Power Company
Trenton Electric Cooperative
Sortaren Bay
Pbtuak
Toguk
Marine
New Stuyahk
Stuyahk
Aniak
Galena, City of
Gambell
Emmonak
China Electric Inc
 champ
Natoklaq Light Plant (Chatham)
Shallock
Kokshaniq Village Council
Cide Utilities
Unnaq Power Company (Nushkak)
Shumagin
Chukhshuk
Tevedock Electric Cooperative
Nelson Island Electric Cooperative, Inc.
Mantley Utility Company
Kokshaniq Village Council
Unquarap Power Company (Newtok)
Kobot Valley Electric Company
Punekte, City of
Welles
Bookland, City of
Mountain Village
Crooked Creek
Pittrow Power Plant
Aklunq Power Company (Katlik)
Red Devil
Naggiqsh Inletnaq Power Company
Tebeq Para Electric Association
Port Hadern, City of
Kvitetd
Andrewof Electric Corporation (Akia)
Lagaroo Power Company
Taltsiak, Transition Power Utility
Akiskok Native Community Electric Co.
Elektro
Severnute
Taltsiak Community Service Alaska
Bakiaq Community Utilities
Eskalo Community Association
Gok, Inc. (Cold Bay)
Eskalo Community Association
Kuig Power Company (Brevard)
Hood River & Hesperia
Kuig Light & Power
Punasseq Power Company (Mekoryuk)
St. Paul
St. Paul Municipal Electric Utility
Teller Power Company
Akaitalk, City
Aklavick Power Utilities
Restick, City of
Eggep Light & Power Co.
Goklight Electric Company
Tebeq Electric Utility
White Mountain Utility
Pedro Bay Village Council
Vebalea Village Electric
Riley, City of
Stevens Village Energy Systems
Tinkle Village Utility

(pcrep2.wpd)  November 16, 1998  3.21
FIGURE 3.10 (part 1)

AVERAGE ANNUAL RESIDENTIAL SALES PER CUSTOMER (PART 1.)

Thousands

GSIC, Inc. (Cold Bay)
Unitalsi Electric Light
St. Paul Housing Electric Light
Ruelle Electric Association
Point MacKenzie
Anchorage
Yukon Power
Wallace/Um
Northwest Pass
Anchorage
Raka
Kigluaik
King Cove, City of
Nanakuli Electric Association, Inc.
Coffman Cove
Unalaska Valley Electric Cooperative
Cordova Electric Cooperative, Inc.
Nushagak Electric Cooperative, Inc. (Ung unusual)
Alaska
Hoonah
Nome Joint Utility System
Haines Light & Power
St. George Municipal Electric Utility
Bethel Utilities Corp Inc.
Shishmaref
Skagway
Tek (includes Dot Lake)
Kignus Light Plant
Anvik Light & Power Company, Inc
Chignik Lake Electric Utility
McGrath Light & Power
Talkeetna Electric Utility
Haines
Shungnak
Nelson Lagoon Electric Cooperative, Inc.
Aluminum Quad.
Pond Inlet
Sand Point Electric Cooperative
Kak Pine
Mendenhall
Port Heiden, City of
Knik-Goose Bay
Thorne Bay Public Utility
Talkeetna
Tok, Alaska
Potter Point Village Council
Kiana
Togiak
New Stuyahok
Nareskag Light Plant (Chevak)
Port Station
Savonoski Bay
Amlux
Hoonah
Evilut
Pond Inlet Power Light
Igarka Electric Company (Loring)
Puliverse Power Company (Hoonah)
Hag Cong
Kwigillingok Electric Company (Kivalina)
Chuitna, City of
Elm
Pikity, City of
St. Mary's
Nightmute Power Plant
Russian Island
Golovochka
Almanthusk Area Utilities
UAF Electric Cooperative
Tummatluk Community Service Area
Tanacross Electric Cooperative
Bella Coola Electric Utility
Skilak
Kipnuk
Haines
Golovochka
Upper Holikagak
Leavelock Electric Cooperative
FIGURE 3.10 (part 2)

AVERAGE ANNUAL RESIDENTIAL SALES PER CUSTOMER (PART 2.)

Thousands

PEC COMMUNITY—HIGHEST TO LOWEST

Battles
Mambl

Ungassuk Power Company (Hunt's)
Gales, City of

Pellin Utility Company
Bogio

Lasson Bay Utility Company
Buddland, City of

Old Hat

Akloq Power Company (Korlins)

Kirk Electric Services
Cold Valley

Napaskak Electric Company

Clearwater

Tiwonak

Doruma Gold Mining

Tikakf

Old Hat

Napaskak Electric Utility

White Mountain Utility

St. Michael

Kippen Bay

Dry Creek

False Pass Electric Association

Egegik Light & Power Co.

Husk

Shayuk

Goodnews Bay

Teek

China Electric Inc.

Titika

Tahle Power Company

Teik

Gulf of Alaska Power

Teiy

Gulch Valley South

Tellula

Hilts Utilities

Hilts, Inc.

Tanana Power Company

Hilts Utilities

Gustavs Electric Utility

Hilts Utilities

Koliganek Village Council

Hilts Village Utility

Kotzebue, Inc.

Tanana Power Company

Tahle Utility

Gustavs Electric Utility

Fort Yukon

Teek

Eskrick Power

Chevak Electric

Fort Yukon, City of

Akloq Power Utilities

Alaskan Energy Systems (Alaskatricity)

Bering Mission

Tikakf

Koliganek Village Council

Akutan Electric Utility

Taltsk Traditional Power Utility

Pine Bay Village Council

Sloane River

Atiahalak Native Community Electric Co.

Unuk River Power Company (Unuk)

Eagle Electric Company

Unuk Village

Eagle Power Company

Taltsk Power Company

Quashnak

Exxon

Tesina Springs

Tulip, City of

Hughes Power and Light

Sheldon Point, City of

Fort Yukon Utilities (Central)

Venetie Village Electric

Kolak Village Electric Company

Venetie Water Company

Heyi Lake

Stevens Village Energy Systems

Beaver Joint Utilities

(pcerp2.wpd) November 16, 1998 3.23
Power Cost Equalization

FIGURE 3.11 (part 1)
MONTHLY RESIDENTIAL BILL WITH PCE DISTRIBUTION (PART 1.)

PCE COMMUNITY—LOWEST TO HIGHEST

(pecrep2.wpd) November 16, 1998 3.24
FIGURE 3.12 (part 1)
MONTHLY RESIDENTIAL BILL AT ANCHORAGE USE RATE (PART 1.)

$0  $100  $200  $300  $400

EXCLUDES 9 UTILITIES WITH MONTHLY RESIDENTIAL USE PER CUSTOMER GREATER THAN ANCHORAGE
FIGURE 3.12 (part 2)
MONTHLY RESIDENTIAL BILL AT ANCHORAGE USE RATE (PART 2.)

EXCLUDES 8 UTILITIES WITH MONTHLY RESIDENTIAL USE PER CUSTOMER GREATER THAN ANCHORAGE

(* Actual 635 KWH / MONTH)
FIGURE 3.13 (part 1)

ANNUAL PCE DISTRIBUTION FOR EACH RESIDENTIAL CUSTOMER (PART 1.)

Power Cost Equalization Economic Significance
ANNUAL PCE DISTRIBUTION FOR EACH RESIDENTIAL CUSTOMER (PART 2.)

FIGURE 3.13 (part 2)
Figure 3.14 (part 1)

Residential Plus Community Facility
% of Eligible KWH (Part 1.)

Power Cost Equalization

Economic Significance

[Diagram showing percentage distribution of eligible KWH across various entities.]
### FIGURE 3.14 (part 2)

**Residential Plus Community Facility**

**% of Eligible KWH (Part 2)**

<table>
<thead>
<tr>
<th>Utility/Community Facility</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stevens Village Energy Systems</td>
<td>60%</td>
</tr>
<tr>
<td>Pelican Utility Company</td>
<td>60%</td>
</tr>
<tr>
<td>Tuntutnek Community Service Association</td>
<td>60%</td>
</tr>
<tr>
<td>Breiv Mission</td>
<td>60%</td>
</tr>
<tr>
<td>Shaputik</td>
<td>60%</td>
</tr>
<tr>
<td>Allakaket Native Community Electric Co.</td>
<td>60%</td>
</tr>
<tr>
<td>Ruby, City of</td>
<td>60%</td>
</tr>
<tr>
<td>Unalaska Power Company (Unalaska)</td>
<td>60%</td>
</tr>
<tr>
<td>St. Michael</td>
<td>60%</td>
</tr>
<tr>
<td>Holy Cross</td>
<td>60%</td>
</tr>
<tr>
<td>Igashivik Electric Company (Dilling)</td>
<td>60%</td>
</tr>
<tr>
<td>Gustav, City of St. Johns</td>
<td>60%</td>
</tr>
<tr>
<td>Tulugak</td>
<td>60%</td>
</tr>
<tr>
<td>St. Mary's</td>
<td>60%</td>
</tr>
<tr>
<td>Nupukak Native Power Company</td>
<td>60%</td>
</tr>
<tr>
<td>Old Harbor</td>
<td>60%</td>
</tr>
<tr>
<td>Levelock Electric Cooperative</td>
<td>60%</td>
</tr>
<tr>
<td>Chignik Electric</td>
<td>60%</td>
</tr>
<tr>
<td>Nipal Light &amp; Power</td>
<td>60%</td>
</tr>
<tr>
<td>Unalaska Electric Utility</td>
<td>60%</td>
</tr>
<tr>
<td>Thorne Bay Public Utility</td>
<td>60%</td>
</tr>
<tr>
<td>Kwig Power Company (Kwig)</td>
<td>60%</td>
</tr>
<tr>
<td>Tsisted Bay</td>
<td>60%</td>
</tr>
<tr>
<td>Alaska Electric Systems (Alaska)</td>
<td>60%</td>
</tr>
<tr>
<td>Alaska Power Utilities</td>
<td>60%</td>
</tr>
<tr>
<td>Selawik</td>
<td>60%</td>
</tr>
<tr>
<td>Savonos</td>
<td>60%</td>
</tr>
<tr>
<td>Marshall</td>
<td>60%</td>
</tr>
<tr>
<td>Old Harbor</td>
<td>60%</td>
</tr>
<tr>
<td>St. George Municipal Electric Utility</td>
<td>60%</td>
</tr>
<tr>
<td>Chuita Valley</td>
<td>60%</td>
</tr>
<tr>
<td>Ring Cove, City of</td>
<td>60%</td>
</tr>
<tr>
<td>Hulua</td>
<td>60%</td>
</tr>
<tr>
<td>Swanen Bay</td>
<td>60%</td>
</tr>
<tr>
<td>Igiarto</td>
<td>60%</td>
</tr>
<tr>
<td>Napizal Electric Utility</td>
<td>60%</td>
</tr>
<tr>
<td>Komo</td>
<td>60%</td>
</tr>
<tr>
<td>Ch획w</td>
<td>60%</td>
</tr>
<tr>
<td>Nernah</td>
<td>60%</td>
</tr>
<tr>
<td>Amalga, John Utilities</td>
<td>60%</td>
</tr>
<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Quinhagak</td>
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<tr>
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<tr>
<td>Athab, City of</td>
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<tr>
<td>Panaamaq Power Company (Kongigig)</td>
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<td>New Shuyokh</td>
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<td>Venize Village Electric</td>
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<td>Chinik Lake Electric Utility, Inc.</td>
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<tr>
<td>Erk</td>
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<td>Keklik Electric Services</td>
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<td>Tsikik</td>
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<td>Mountain Village</td>
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<tr>
<td>Katolin Electric Service</td>
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<td>Mountain Village</td>
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<td>Noletoak Light Plant (Kefarma)</td>
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<tr>
<td>Roger Bay</td>
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<tr>
<td>Shilman</td>
<td>60%</td>
</tr>
<tr>
<td>Tailixa Electric Utility</td>
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<tr>
<td>Wipuk Light Plant</td>
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</tr>
<tr>
<td>Kwjukuluc, Inc.</td>
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</tr>
<tr>
<td>Nopok</td>
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<tr>
<td>Buckland, City of</td>
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<td>Yulatask Traditional Power Utility</td>
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<tr>
<td>Rankik</td>
<td>60%</td>
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<tr>
<td>St. Paul Municip Power Utility</td>
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</tr>
<tr>
<td>Piof Stufla</td>
<td>60%</td>
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<tr>
<td>Kottuix Electric Association</td>
<td>60%</td>
</tr>
<tr>
<td>Lower Hoiskau</td>
<td>60%</td>
</tr>
<tr>
<td>Piikas Point</td>
<td>60%</td>
</tr>
</tbody>
</table>

*Figure shows the percentage of eligible KWH for various utilities and communities.*
4. ELIMINATION OF THE POWER COST EQUALIZATION PROGRAM -- OVERVIEW

UTILITY MECHANISM FOR ABSORBING LOSS

With the elimination of the Power Cost Equalization Program (PCE) participating electric utilities would immediately begin to charge residential, community facility, and commercial customers the full published rates for all electricity sales. The average cost of electricity to customers in the residential and community facility classes would increase dramatically because almost all residential and community class sales are presently made at much lower PCE rates. For example the typical utility residential customer rate with PCE is about 44 percent of the full published rate which means the rate would increase 127 percent \((56/44)\) to adjust to the full published rate. The average cost of electricity to commercial customers would typically increase by a smaller percent since only a portion of commercial class sales are made at the lower PCE rate. Shifting to fully published rates would not increase the cost of electricity to government and “other” customer classes because these customer classes are not eligible for PCE payments.

Customers would respond to the higher full published rates by cutting back on their electricity purchases. The reduction in purchases would be most pronounced for the residential and community facility classes since the average price per kwh would increase the most to these customer classes. The reduction for commercial class customers would be less pronounced since the increase from the average price with PCE to the published rates would not be as large. There would be no reduction in purchases by government and “other” class customers.

Faced with a reduction in sales the typical electric utility would reduce production and try to cut costs to eliminate its deficit and balance its budget. Although diesel fuel expenses vary with sales, most other utility costs such as personnel expenses, maintenance, interest on debt, and depreciation are fixed and cannot be reduced when sales decline, particularly in the short run. Because a large share of the utility costs are fixed, the average cost of producing electricity would increase when sales decrease, and as a result the utility would need to raise its rates above the full published rates in addition to cutting costs to bring revenues back into line with expenses.

The rate increase necessitated by the reduction in sales would effect all customer classes, resulting in a further reduction in sales to all customer classes. This in turn would lead to a further rate increase, which would further reduce sales. This cycle of rate increases and sales reductions would continue until either an equilibrium level of sales had been reached where the utility was able cover all its costs at higher rates, or the utility was forced out of business because it could not cover its deficit with higher rates. If the utility were able to continue in operation, its sales would be lower, its rates higher, and its average cost of generation higher than when PCE was in force.

Figure 4.1 shows the current rates per kwh for each customer class for the PCE utilities as...
well as the rates that would result if PCE were eliminated. With PCE, the rate for PCE eligible kwh and the average kwh rate for the residential and community facility customers are almost the same. This is because almost all kwh in these customer classes are PCE eligible. In contrast, the PCE kwh rate for commercial customers is below the average rate because only a small portion of all commercial sales are PCE eligible. For the government and “other” customer categories no kwh are PCE eligible, and this is shown in the figure as a PCE eligible rate equal to the average kwh rate.

Elimination of PCE would initially shift all rates up to the full published rates. This would be a more than doubling of the average rate for residential and community facility customers. The average rate for commercial customers would increase by about 6 cents and the average rate for government and “other” customers would not go up at all. The cycle of sales reductions and further rate increases would result in post PCE rates coming to rest at higher levels than the published rates for all customer classes. The post PCE increases over the published rates are about the same for all customer classes. The total increase, comparing the average kwh rate with PCE and the post PCE rate, is greatest for residential customers followed by community facilities. The increase for commercial customers is not as great, and the increase for government and “other” customers is the smallest. However all customer classes share some of the burden of higher average costs of generation in the form of higher electricity rates in the post PCE environment.

**DEATH SPIRAL**

The cycle of higher rates leading to reductions in sales which in turn necessitate even higher rates may lead to a “death spiral” for the utility. In a “death spiral” the reduction in total costs from each unit reduction in sales is less than the reduction in total revenues and rates can never be raised high enough to eliminate the deficit.

Whether a particular utility will fall into a “death spiral” or will be successful at finding a reduced level of sales together with higher rates that cover its costs depends primarily on three factors:

1. The more sensitive customer electricity purchases are to rate increases the more likely a utility will fall into a “death spiral”. (This sensitivity is known as the price elasticity of demand, and the more negative its value the greater the sensitivity.)
2. The larger the number of customers that shift to self generation of electricity when faced with higher utility electric rates the more likely a utility will fall into a “death spiral”, and
3. The greater the share of utility costs that are fixed and thus cannot be reduced when sales decline, the more likely a utility will fall into a “death spiral”.

---

7 These rates are averaged over all PCE utilities.
Figure 4.2 shows how the death spiral can occur. In the figure both the cost per kwh of electricity and the revenues per kwh of electricity are shown to increase as the level of sales declines. Initially when PCE is eliminated the utility has sales of about 660 thousand kwh and faces a deficit of about $.18 per kwh. This is because the cost per kwh is about $.37 compared to rates charged that generate about $.19 per kwh for the utility. The utility will increase rates to cover the deficit, but this will contract sales to between 450 and 525 thousand kwh depending on the sensitivity of sales to the rate increase up to $.37 per kwh. At this lower level of sales the average cost also is higher. For example at 500 thousand kwh of sales the average cost has risen to about $.43 per kwh.

In Figure 4.2 we see that there is an equilibrium level of sales for this hypothetical utility at which average cost equals average revenue, if sales are not very sensitive to price, as illustrated by point A. Here the reduction in sales moves along the line II from the initial point. However with slightly higher sensitivity of sales, where the reduction in sales moves along the line SS from the initial point, average cost remains above average revenue no matter how much sales are reduced. In this case the utility would be in a "death spiral".

Figure 4.3 is an alternative way to show the idea of the "death spiral" by focusing on the size of the utility deficit. When the PCE disbursement is withdrawn from the utility a deficit opens that must be eliminated by raising rates initially to the full published level. This will reduce sales and necessitate a further increase. The deficit will fall with higher rates, at least up to a point. If the deficit is gone by that point, the utility will survive. If the deficit is not gone the utility will fall into a "death spiral" since rates above that point will only serve to increase the size of the deficit. Figure 4.3 shows the relationship between the size of the rate increase above the published rates and the size of the utility deficit. Each higher line is based on a successively more sensitive consumer response to higher rates. For this hypothetical utility the deficit can be eliminated if the sensitivity is less than -.25. At higher sensitivities there is no rate that will eliminate the deficit. The utility falls into a "death spiral".

SENSITIVITY OF SALES TO ELECTRICITY RATES

A regression analysis using data for 1996 shown as Figure 4.4 suggests that the electricity purchases of the average residential customer of a PCE utility are positively related to household income and negatively related to the average price of electricity. Specifically the equation shows that an increase in the average electricity rate by 100 percent is associated with a reduction in purchases by 21 percent. For example for a PCE utility with typical characteristics, such as Alakaket, the S

8 The coefficient on the price term in the double log equation represents the price elasticity [percent decrease in sales / percent increase in price]. In this regression it has a value of -.207. This result is significant at the 95 percent confidence level even though the total explanatory power of the equation is relatively low as reflected by the R square value of .32.

(pcerep2.wpd) November 16, 1998 4.3
Residential rate for sales less than 700 kwh per month would increase from $.15 to a full published rate of $.39 if the PCE were eliminated. This represents a 160 percent rate increase which would, assuming a price elasticity of demand of -2, result in a reduction in electricity use of 32 percent for the typical residential customer (-20 percent multiplied by 1.6). This reduction in sales, combined with similar responses by other categories of customers, would require a further increase in the residential rate to $.47 to cover total costs at the lower level of sales. The total residential rate increase, from $.15 to $.47 would be 213 percent and result in a reduction in sales to the typical residential customer of 43 percent (-20 percent multiplied by 2.13).

Rate increases of this magnitude are sure to have dramatic effects on consumption levels since they are large enough to negatively impact total household disposable income. Furthermore the statistical analysis is only suggestive since the large rate increases that would result from the elimination of PCE are not reflected in the variation in current effective residential rates among the PCE utilities. The effective rates range from about $.10 to $.38 per kwh and do not include examples of the experience of consumers facing rates above $.40 per kwh. Consequently our estimated sensitivity of residential sales may be an underestimate.

Residential customers would respond to higher rates by reducing their use of appliances, getting rid of appliances, or terminating use of electricity altogether. We do not have any specific basis for estimating how many customers would stop using electricity altogether although utility spokesmen suggested that this would occur. Clearly the fact that a significant share of households are below the poverty level suggests that some residential customers would forgo electric service because they would be unable to pay their bill at the higher rate. This would further increase the sensitivity of utility sales to rate increases.

We would not expect the response to higher rates to happen all at once. A portion would occur immediately because a higher rate effectively reduces the income of a household, but some of the effect would only show up gradually as appliances aged and were not replaced. A slightly positive trend in average residential use over time from a subset of PCE utilities (described in Section 3.) suggests that the adjustment to the lower PCE rates has taken place over a period of years, and that the adjustment to higher rates would also take place over a period of years rather than immediately.

The substantial rate increase for community facilities would also result in a reduction in use, but we do not have any historical analysis of how electricity use has varied with price for this class of customer. We assume the electricity use by these facilities, as for residential customers, is not very sensitive to price, but that there would be some reduction in use if the rates increased substantially. This class of customers is more varied than residential and includes facilities such as offices, washeterias, and water and sewer facilities. Some of these require constant power, but electricity use could be reduced at some of these facilities. These facilities might also close if the price of electricity became prohibitive.

We would also expect that electricity use by commercial, government, and “other” customers would also be sensitive to rates, but we have not estimated the strength of that relationship.
SELF GENERATION OF ELECTRICITY

Higher electricity rates would cause some customers to self generate their own electricity. The presence of this phenomenon increases the sensitivity of electricity sales to rate increases above the -.2 elasticity we have estimated and increases the possibility of a “death spiral”.

Self generation would be a very expensive alternative for a residential customer because of the high cost of fuel, the investment required in generation equipment, a protective housing, and fuel storage facilities, the lower efficiency of operation compared to utility generation, and the time required to operate and maintain the system. In addition self generation imposes potential environmental costs on a community due to issues surrounding fuel handling and disposal of hazardous wastes.

Although the threshold rate at which self generation becomes economic for a household depends not only on the costs but also on the use characteristics of the household, under almost all circumstances that threshold will be considerably above $1 per kwh and thus rule out self generation as an alternative. For example if the cost of fuel to an individual is twice the bulk rate to the utility, the cost of a generator twice that of the utility per kW, and the efficiency is half that of utility generation, then the cost per kwh will easily be above $1 per kwh for self generation.

Of course if a utility were to fall into a “death spiral”, some residential customers would self generate rather than do without electricity altogether, but it does not make economic sense to self generate as long as the utility is in operation.

It is the non-residential customers that have a large electricity requirement that might self generate if electricity rates rose sufficiently. Schools, hospitals, and commercial businesses such as fish processors would be the most likely customers that might choose to self generate if the price of electricity increased, or if the reliability of electric service deteriorated. Some of these customers in some communities currently have backup capability in the event of a power outage by the utility, and they could self generate at the cost of running their facilities that are already in place. This could be economically advantageous to the large user at the same time that it loads higher costs onto those smaller customers left with the utility who do not have the capacity to self generate. This increases the vulnerability of small utilities to the “death spiral”. In addition the combination of utility generation and self generation could raise the total cost of electricity generation within the community because of the loss of any economies of scale associated with a single generation source.

A strategic danger from a strategy of self generation under these circumstances would be that if the utility ceased operation because of a loss of sales and customers, there would cease to be backup generating capacity in the community.

The cost of self generation would be much higher for customers that do not currently have installed backup capacity since they would need to purchase capacity, and it is unlikely that the full cost would be competitive with utility supplied electricity. However there would
undoubtedly be instances where the self generation threshold was low enough so that rate increase would result in some self generation. Furthermore the closure of a utility would likely force some large users to purchase equipment and generate their own power.

If a utility ceased operation some customers such as the hospitals, schools, water, and sewer facilities would self generate in order to continue operations. The cost of electricity from self generation would be higher than the price of utility electricity, and this higher cost would need to be passed on to customers or others. If there are facilities in a community that require electricity to operate, that electricity must be supplied and paid by some mechanism.

SENSITIVITY OF UTILITY EXPENSES TO SALES

Utility representatives indicated that fuel expenses are generally the only truly variable cost in their operations. The other main categories of expenses are personnel, administration including insurance, maintenance and repairs, depreciation, and interest. As long as the number of customers and the physical plant do not change, the expenses associated with operation and maintenance will not vary much with variation in the number of kwh sold. Forced reductions in these expenses would result in a deterioration in the quality of service and early retirement of facilities.

Fuel expense as a share of total costs varies across utilities. Overall it makes up a little less than 1/3 of the total, but it is less important for smaller utilities. Thus if fuel is the only variable expense, the capability of reducing total expenses in response to a reduction in sales is limited and the average cost per kwh will be very sensitive to reductions in sales. For example for 1996 Elim reported sales of about 677 thousand kwh with expenses of $237 thousand resulting in an average cost of generation of about $.35 per kwh. Figure 4.5 shows how the average cost would rise as generation/sales declined. The higher line represents the response based on their actual cost structure where about $1/4 of total costs are fuel expenses. We see that the average cost increases at an increasing rate as generation/sales decline. As generation falls from 675 to 575 thousand kwh the average cost increases from $.35 to $.396 per kwh, an increase of $.046. As generation falls from 575 to 475 thousand kwh the average cost increases from $.396 to $.46, and increase of $.064.

The lower line shows the change in average cost in response to reduced generation if the fuel expense were $1/3 of the total rather than $1/4. This line would also represent a situation where fuel expense was $1/4 of the total but some other expenses could be reduced in response to a reduction in sales. We see that when a larger share of total costs are variable, the average cost of generation does not rise as fast with reductions in generation. However the difference is not very pronounced over a broad range of generation levels. At a generation level of 475 thousand kwh for example the average cost of generation in the case of more flexibility with respect to expenses ($1/3 of total expenses) is $.45 compared to $.46 if only $1/4 of expenses are variable.

Some expenses submitted to the Alaska Public Utilities Commission by the PCE utilities are not allowed either because they are in excess of minimum efficiency standards or because
they are judged not to be necessary or reasonable. Under the pressure to reduce a deficit caused by the termination of the PCE program some utilities might be able to reduce or eliminate some of these costs. Elimination of any of these costs would help to avoid a “death spiral”. We did not conduct a detailed analysis to try to determine the extent of these disallowed costs or the categories of such costs. However we calculated that overall about 77 percent of submitted eligible costs were allowed and about 81 percent of eligible costs were allowed for the typical (median) utility. The range of percentages extended from a low of 28 percent to a high of 100 percent. This suggests that the opportunity for cost reductions from the elimination of these disallowed costs is limited.

**IMPACTS ON CUSTOMERS**

Elimination of PCE would force customers both to pay more for electricity and to use less. The tradeoff between the size of the increase in the bill and the size of the reduction in use depends upon how sensitive use is to the price of electricity. For the typical utility and customer we calculate that the monthly electricity bill might increase by 80 percent at the same time that use of electricity fell by 40 percent (consistent with an increase in the rate by 200 percent). If use were less sensitive to price the bill would increase by a larger percentage, but use would fall by a smaller percentage.

Figure 4.6 shows graphically how that tradeoff depends upon the sensitivity of use to the rate. If there were no price sensitivity of use the entire burden would be in the form of a monthly bill about 130 percent above the PCE level and a reduction in purchases of other goods and services to finance that higher bill. With increasing price sensitivity a portion of the burden is shifted away from a higher monthly bill toward lower monthly use. At a price elasticity of about -.35 the burden would consist entirely of a reduction in electricity use of about 65 percent with no increase in the electricity bill above the PCE level. If the price sensitivity were greater the total electricity bill would actually decline, but such a high level of price sensitivity for the typical residential customer is unlikely.

Residential customers will also indirectly pay a share of the increase in electricity rates experienced by community facility and commercial customers. These users will pass through a portion of any rate increases to their customers in the form of higher prices, or to their employees in the form of lower wages. In most cases these customers and workers are members of the households in the community.

The other customer classes of government and “other” will not experience rate increases as large as the residential, commercial, and community facility classes. Since government consists of state and federal government customers, increased electric bills will not directly effect the local economy or households. Most utilities do not have customers in the “other” category.
FIGURE 4.1

COST OF ELECTRICITY
RESIDENTIAL CUSTOMER

COST OF ELECTRICITY
COMMUNITY CUSTOMER

COST OF ELECTRICITY
COMMERCIAL CUSTOMER

COST OF ELECTRICITY
GOVT & OTHER CUSTOMER
FIGURE 4.2

WHEN GENERATION DECLINES BOTH AVERAGE COST AND REVENUE INCREASE—BUT NOT EQUALLY

AVERAGE COST PER KWH

AVERAGE REVENUE -- AVERAGE COST PER KWH

Thousands

SALES / GENERATION IN KWH

- COST PER KWH
- DEMAND AT .25 ELASTICITY
- DEMAND AT .3 ELASTICITY (SS)
- DEMAND AT .2 ELASTICITY (II)
Figure 4.3

Raising rates reduces the deficit—up to a point.

The budget deficit (in thousands) is plotted against the percent of the published rate. Three curves are shown, each representing a different elasticity:

- Elasticity = 0.3
- Elasticity = 0.25
- Elasticity = 0.2
- Elasticity = 0.15

The more responsive sales are to rate increases (elasticity), the less likely a utility can wipe out a deficit.
FIGURE 4.4

PRICE AND INCOME ELASTICITY OF PCE UTILITY RESIDENTIAL DEMAND

DOUBLE LOG REGRESSION

-0.297  PRICE COEFFICIENT = PRICE ELASTICITY
0.080  STANDARD ERROR OF COEFFICIENT
0.445  HOUSEHOLD INCOME COEFFICIENT = INCOME ELASTICITY
0.065  STANDARD ERROR OF COEFFICIENT
3.234  CONSTANT
134   OBSERVATIONS
0.320  R²

RELATIONSHIP OF HH INCOME AND ELECTRIC SALES

RELATIONSHIP OF AVG RESIDENTIAL PRICE AND ELECTRIC SALES
FIGURE 4.5

COST AS A FUNCTION OF GENERATION

AVERAGE COST PER KWH $$

FUEL EXPENSE 1/4 OF TOTAL
FUEL EXPENSE 1/3 OF TOTAL

GENERATION (KWH)

COST AS A FUNCTION OF GENERATION

AVERAGE COST PER KWH $$

FUEL EXPENSE 1/4 OF TOTAL
FUEL EXPENSE 1/3 OF TOTAL

GENERATION (KWH)
FIGURE 4.6

THE TRADEOFF OF A HIGHER ELECTRICITY BILL AND LESS ELECTRICITY USE

WHERE THE CUSTOMER ENDS UP DEPENDS ON HIS SENSITIVITY TO PRICE INCREASE (PRICE ELASTICITY OF DEMAND)
Because each community is different we cannot predict the effect of the elimination of the Power Cost Equalization Program on each one. The chart below shows the wide range of characteristics among the PCE communities and utilities. No single community or utility can be identified as the minimum, median (50 percent above and 50 percent below that level), or maximum for all these characteristics.

<table>
<thead>
<tr>
<th>Community / Utility Characteristic</th>
<th>Minimum</th>
<th>Median</th>
<th>Maximum</th>
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</thead>
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<tr>
<td>Population</td>
<td>11</td>
<td>264</td>
<td>5,195</td>
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<tr>
<td>Household Income</td>
<td>$9,141</td>
<td>$35,203</td>
<td>$84,964</td>
</tr>
<tr>
<td>PCE Payment to Community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$5,467</td>
<td>$71,363</td>
<td>$813,312</td>
</tr>
<tr>
<td>Per Eligible KWH</td>
<td>$.02</td>
<td>$.22</td>
<td>$.40</td>
</tr>
<tr>
<td>Per Residential Customer</td>
<td>$63</td>
<td>$1,059</td>
<td>$2,733</td>
</tr>
<tr>
<td>Share of Total Revenues</td>
<td>5%</td>
<td>31%</td>
<td>60%</td>
</tr>
<tr>
<td>Sales (kwh)</td>
<td>21,452</td>
<td>651,507</td>
<td>32,564,724</td>
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<tr>
<td>Fuel Price</td>
<td>$.71</td>
<td>$1.14</td>
<td>$2.26</td>
</tr>
<tr>
<td>Residential/Total Sales</td>
<td>11%</td>
<td>41%</td>
<td>85%</td>
</tr>
<tr>
<td>Residential Rate (kwh)</td>
<td></td>
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</tr>
<tr>
<td>Published</td>
<td>$.15</td>
<td>$.42</td>
<td>$.62</td>
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<tr>
<td>PCE Eligible</td>
<td>$.10</td>
<td>$.17</td>
<td>$.38</td>
</tr>
<tr>
<td>Residential Sales/ Customer (kwh)</td>
<td>644</td>
<td>3,921</td>
<td>10,201</td>
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<tr>
<td>Monthly Residential Bill</td>
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<tr>
<td>Without PCE</td>
<td>$24</td>
<td>$121</td>
<td>$320</td>
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<tr>
<td>Net of PCE</td>
<td>$16</td>
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<td>Annual Average Residential Bill</td>
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<tr>
<td>Actual Bill</td>
<td>$188</td>
<td>$790</td>
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<tr>
<td>PCE Support</td>
<td>$41</td>
<td>$696</td>
<td>$1,725</td>
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</table>

In this section we examine what the effect of elimination of PCE is likely to be on three places. They have been chosen to be representative of the range of characteristics of the 190 communities served by PCE. Elim has many characteristics of the median PCE community, meaning that about half the communities are larger and half are smaller, although it is not the median in all characteristics. Shageluk is one of the smallest of the communities, and Nome is representative of the largest of the PCE communities. For comparative purposes we have included a similar analysis of several additional communities in an appendix.

The analysis in this section is based on the information for fiscal year 1996 reported by the utilities to the Division of Energy together with assumptions regarding the sensitivity of sales to rates and the sensitivity of the average cost of generation to the level of sales. Based on the discussion from the previous Section we make the following assumptions:

1. The price elasticity of demand for electricity among residential, community facility, and commercial customers is -.2. Elasticity is -.1 (sales are less sensitive to rates) for government and “other” customers.
2. No customers switch to self generation at higher rates.
3. Fuel expenses are the only variable cost for utilities.

**ELIM--A TYPICAL PCE DEPENDENT UTILITY**

Elim is representative of the typical PCE community and utility in many ways (Figure 5.1, part 4). The community has a population of 281, annual sales are 677,326 kwh, the fuel price is $1.08 per gallon, and residential use per customer is 4,202 kwh per year. The cost of electricity generation is about 41 cents per kwh and the residential consumer, after the PCE adjustment, pays about 17 cents for an eligible kwh. The utility receives $941 annually on behalf of the average residential customer.

Elim differs from the average PCE utility in that it is more heavily dependent on PCE payments than most. 68 percent of its kwh are eligible for PCE and it receives 40 percent of its revenues from PCE.

With elimination of $113 thousand of PCE payments, rates increase and sales decline until an equilibrium is reached where revenues and expenses are balanced without PCE. The conditions under which this happens are shown in Figure 5.1, part 1.

The average residential rate increases from 19 to 55 cents, 190 percent. The impact on the typical household is a reduction in sales of 38 percent while the typical residential electric bill increases by 80 percent (Figure 5.1, part 3). The typical household is spending 4.4 percent of its income for 217 kwh per month. Including the cost of electricity for the operation of community facilities (paid by local residents), the typical household is paying 6.1 percent of its income for electricity generation. The average household cost of electricity, including community facilities is $1,954.

Total sales falls by 30 percent but expenses fall by only 7 percent because the only...
variable cost is fuel. Consequently the cost of generation increases from 41 cents per kwh to 55 cents, an increase of 33 percent.

The burden on the community from the termination of PCE depends upon the share of the added costs of electricity that can be shifted outside the community. We assume that local residents pay the entire cost of additional residential and community facility rates, 1/3 of the cost of a higher commercial rate, but none of the cost of a higher government rate (There are no sales in the "other" category). As a result the local burden measured as the loss of household purchasing power is $73.5 thousand (Figure 5.1, part 2) which represents about 3.1 percent of the household income of the community. About $21 thousand of the burden is shifted outside the community.

Elim is able to fully recover its costs of operation at the higher rates through a combination of reduced fuel expenditures, a higher residential rate, and higher rates for other classes of customers (Figure 5.1, part 3). However if the customer response to the higher rates is more pronounced (the price elasticity of demand is 30 percent rather than 20 percent), the utility would face a deficit that it could not eliminate through rate increases and it would fall into a "death spiral".

Elim is able to fully recover its costs of operation at the higher rates through a combination of reduced fuel expenditures, a higher residential rate, and higher rates for other classes of customers (Figure 5.1, part 3). However if the customer response to the higher rates is more pronounced (the price elasticity of demand is 30 percent rather than 20 percent), the utility would face a deficit that it could not eliminate through rate increases and it would fall into a "death spiral".

Figure 5.2 shows the outcome for Elim if customer use is more sensitive to rates. The utility would have a deficit (negative balance) of $45 thousand out of total expenses of $254 thousand. Either raising or reducing rates would increase the size of this deficit. The deficit would need to be covered from an outside source if the utility were to remain financially viable.

Under this severe stress it is unlikely that the utility would be able to continue in operation.

**Nome--A LARGE PCE UTILITY**

Nome is the third largest PCE utility, after Bethel and Unalaska, in terms of electricity sales and about 40 times larger than the typical (median) sized PCE utility (Figure 5.3). The community has a population of 3,984, annual sales are 26,039,748 kwh, the fuel price is $.71 per gallon, and residential use per customer is 5,995 kwh per year. The cost of electricity is about 20 cents per kwh and the residential rate, after the PCE adjustment, for an eligible kwh is about 15 cents. The utility receives $200 annually on behalf of the average residential customer.

Nome is less dependent on PCE payments than all but a few PCE utilities. 33 percent of its kwh are eligible for PCE, but it receives only 8 percent of its revenues from PCE.

With elimination of $399 thousand of PCE payments the average residential rate increases from 16 to 20 cents, 23 percent. Residential sales fall by 5 percent and the typical electric bill increases by 17 percent. The typical household is spending 1.8 percent of its income for 477 kwh per month. Including the cost of electricity for the operation of community facilities, the typical household is paying 2.1 percent of its income for electricity generation, in
spite of the fact that community facility usage falls 6 percent. The average household cost of electricity, including community facilities, is $1,373.

Total sales falls by 2 percent but expenses fall by only 1 percent because the only variable cost is fuel. Consequently the cost of generation increases 2 percent.

Because of the limited dependence of the utility on PCE, Nome is able to continue operations, but the typical residential customer experiences a 17 percent increase in his bill.

SHAGELUK--A SMALL PCE DEPENDENT UTILITY

Shageluk is one of the smallest communities served by a PCE utility. The community has a population of 144, annual sales are 254,361 kwh, the fuel price is $1.11 per gallon, and residential use per customer is 3,355 kwh per year. The cost of electricity is about 37 cents per kwh and the residential rate, after the PCE adjustment, is about 10 cents for an eligible kwh. The utility receives $915 annually on behalf of the average residential customer.

Shageluk differs from the average PCE utility in that it is more heavily dependent on PCE payments than most. About 80 percent of its kwh are eligible for PCE, and it receives 59 percent of its revenues from PCE.

With elimination of PCE the residential rate increases from 10 to 42 cents, 326 percent. Residential sales fall by 65 percent and the typical electric bill increases by 48 percent. The typical household is spending 1.4 percent of its income for 97 kwh per month. Including the cost of electricity for the operation of community facilities, the typical household is paying about 1.9 percent of its income for electricity generation, in spite of the fact that community facility usage falls 69 percent. The average household cost of electricity, including community facility facilities, is $663.

Total sales falls by 49 percent but expenses fall by only 15 percent because the only variable cost is fuel. Consequently the cost of generation increases from 37 cents per kwh to 62 cents, an increase of 67 percent.

At the higher rates this utility is not financially viable. It has a deficit (negative balance) of $26 thousand out of a total budget of $80 thousand. This deficit cannot be reduced by raising or lowering rates. This utility could not survive without external financial assistance.
### FIGURE 5.1 (part 1)

#### Power Cost Equalization

#### PCE IMPACT (PART 1)

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALES (KWH)</td>
<td>677,325</td>
<td>470,935</td>
<td>206,390</td>
</tr>
<tr>
<td>Residential</td>
<td>$315,144</td>
<td>$195,597</td>
<td>$119,547</td>
</tr>
<tr>
<td>Commercial</td>
<td>$201,059</td>
<td>$180,973</td>
<td>$20,086</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$31,178</td>
<td>$71,869</td>
<td>($40,691)</td>
</tr>
<tr>
<td>Government</td>
<td>$29,354</td>
<td>$28,365</td>
<td>$988</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$279,695</strong></td>
<td><strong>$181,238</strong></td>
<td><strong>$98,457</strong></td>
</tr>
</tbody>
</table>

**Expense**

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<thead>
<tr>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>$62,350</td>
<td>($18,457)</td>
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<tr>
<td>Non Fuel</td>
<td>$174,912</td>
<td>$94,912</td>
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<tr>
<td>Other</td>
<td>$42,432</td>
<td>$0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$279,695</strong></td>
<td><strong>$181,238</strong></td>
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</tbody>
</table>

**Revenue**

<table>
<thead>
<tr>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$107,157</td>
<td>($18,457)</td>
</tr>
<tr>
<td>Commercial</td>
<td>$92,416</td>
<td>($18,457)</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$39,369</td>
<td>$17,330</td>
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<tr>
<td>Government</td>
<td>$15,556</td>
<td>$3,433</td>
</tr>
<tr>
<td>Other</td>
<td>$690</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$261,226</strong></td>
<td><strong>$181,238</strong></td>
</tr>
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</table>

**Balance**

<table>
<thead>
<tr>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCE</td>
<td>$0</td>
<td>($12)</td>
</tr>
</tbody>
</table>

#### Household Impact

<table>
<thead>
<tr>
<th>Field</th>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income(H)</td>
<td>$4,202</td>
<td>$4,202</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Electric Bill</td>
<td>$350</td>
<td>$350</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

#### Economic Significance

**AVG PRICE/KWH**

<table>
<thead>
<tr>
<th>Field</th>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$0.19</td>
<td>$0.19</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Commercial</td>
<td>$0.36</td>
<td>$0.36</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$0.17</td>
<td>$0.17</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Government</td>
<td>$0.41</td>
<td>$0.41</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>$0.41</td>
<td>$0.41</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**Household Data**

<table>
<thead>
<tr>
<th>Field</th>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>Change</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>74 HH</td>
<td>$32,242</td>
<td>$32,242</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>74 Res Cust</td>
<td>$7,95</td>
<td>$7,95</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>74 Res Cust</td>
<td>$1,949</td>
<td>$1,949</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>2.0% Electric Bill Share of Income</td>
<td>4.4%</td>
<td>4.4%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>3.4% Electric Cost Share of Income</td>
<td>6.1%</td>
<td>6.1%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Annual Use Per Res Cust</td>
<td>2,608</td>
<td>2,608</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Monthly Use Per Res Cust</td>
<td>217</td>
<td>217</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

November 16, 1998

(pcerp2.wpd)
### PCE Impact (Part 2): Community Impact

<table>
<thead>
<tr>
<th>Category</th>
<th>Direct Financial Burden from PCE Loss (If All Borne by Community)</th>
<th>Direct Financial Burden from PCE Loss (If Some Shifted Outside Community)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Residential</td>
<td>Residential</td>
</tr>
<tr>
<td></td>
<td>$47,555</td>
<td>$47,555</td>
</tr>
<tr>
<td></td>
<td>Commercial</td>
<td>Commercial</td>
</tr>
<tr>
<td></td>
<td>$26,115</td>
<td>$8,618</td>
</tr>
<tr>
<td></td>
<td>Community Facility</td>
<td>Community Facility</td>
</tr>
<tr>
<td></td>
<td>$17,330</td>
<td>$17,330</td>
</tr>
<tr>
<td></td>
<td>Government</td>
<td>Government</td>
</tr>
<tr>
<td></td>
<td>$3,433</td>
<td>$3,433</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>Balance</td>
<td>Balance</td>
</tr>
<tr>
<td></td>
<td>$12</td>
<td>$12</td>
</tr>
</tbody>
</table>

Percent Decline in HH Income from PCE Loss: 3.1%

Amount Shifted Outside Community: $20,930
FIGURE 5.1 (part 3)

PCE IMPACT (PART 3.) : FIGURES

ELIM

ELECTRICITY RATES

Residential

Commercial

Community

Govt

Other

AVG WITH PCE

AVG WITHOUT PCE

PUBLISHED RATE

REPLACEMENT OF PCE LOSS

WITH PCE

NO PCE

PCE EXPENDITURES

RESIDENTIAL RATES

NON-RESIDENTIAL RATES

AVERAGE RESIDENTIAL BILL

WITH PCE

NO PCE

AVERAGE RESIDENTIAL USE

WITH PCE

NO PCE

November 16, 1998
### FIGURE 5.1 (part 4)

#### PCE IMPACT (PART 4): COMMUNITY AND UTILITY CHARACTERISTICS

**Utility Characteristics**

<table>
<thead>
<tr>
<th>Category</th>
<th>Elim AVEC</th>
<th>MEDIAN PCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>281</td>
<td>264</td>
</tr>
<tr>
<td>KWH Sold</td>
<td>677,326</td>
<td>651,507</td>
</tr>
<tr>
<td>Fuel Price Per Gallon</td>
<td>$1.08</td>
<td>$1.14</td>
</tr>
<tr>
<td>Share of KWH Generated That Are Eligible For PCE</td>
<td>68.1%</td>
<td>57%</td>
</tr>
<tr>
<td>Utility Dependency Ratio (PCE Payment / Total Revenues)</td>
<td>40.4%</td>
<td>31%</td>
</tr>
<tr>
<td>PCE Payment Calculated by Formula</td>
<td>$112,501</td>
<td>$71,353</td>
</tr>
<tr>
<td>PCE Payment Calculated by Formula Per HH</td>
<td>$1,526</td>
<td>$1,059</td>
</tr>
<tr>
<td>PCE Payment Per Eligible KWH (Cents)</td>
<td>24.5</td>
<td>22.4</td>
</tr>
<tr>
<td>Residential KWH Per Customer (Annual)</td>
<td>4,202</td>
<td>3,921</td>
</tr>
<tr>
<td>Portion of Residential Sales Eligible for PCE</td>
<td>91.4%</td>
<td>90%</td>
</tr>
<tr>
<td>Residential Share of Total Utility KWH Sales</td>
<td>46.5%</td>
<td>41%</td>
</tr>
<tr>
<td>Residential Rate Per PCE Eligible KWH</td>
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<td></td>
</tr>
<tr>
<td>Before PCE</td>
<td>41.3</td>
<td>42</td>
</tr>
<tr>
<td>PCE</td>
<td>24.2</td>
<td>22</td>
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<tr>
<td>With PCE</td>
<td>17.1</td>
<td>17</td>
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<tr>
<td>Monthly Residential Bill</td>
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</tr>
<tr>
<td>Before PCE</td>
<td>$145</td>
<td>$121</td>
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<tr>
<td>PCE</td>
<td>$78</td>
<td>$64</td>
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<tr>
<td>With PCE</td>
<td>$56</td>
<td>$66</td>
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<tr>
<td>Share of PCE Paid to Each Customer Class</td>
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<td></td>
</tr>
<tr>
<td>Residential</td>
<td>62%</td>
<td>67%</td>
</tr>
<tr>
<td>Community</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>Commercial</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>PCE Payment Per Customer By Customer Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>$941</td>
<td>$608</td>
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<tr>
<td>Community</td>
<td>$4,591</td>
<td>$1,802</td>
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<tr>
<td>Commercial</td>
<td>$1,139</td>
<td>$604</td>
</tr>
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</table>

**Economic Significance**

<table>
<thead>
<tr>
<th>Category</th>
<th>Elim AVEC</th>
<th>MEDIAN PCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>264</td>
<td></td>
</tr>
<tr>
<td>KWH Sold</td>
<td>651,507</td>
<td></td>
</tr>
<tr>
<td>Fuel Price Per Gallon</td>
<td>$1.14</td>
<td></td>
</tr>
<tr>
<td>Share of KWH Generated That Are Eligible For PCE</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>Utility Dependency Ratio (PCE Payment / Total Revenues)</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>PCE Payment Calculated by Formula</td>
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<td></td>
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<td>Portion of Residential Sales Eligible for PCE</td>
<td>90%</td>
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<td>Residential Share of Total Utility KWH Sales</td>
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</tr>
<tr>
<td>Residential Rate Per PCE Eligible KWH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before PCE</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>PCE</td>
<td>22</td>
<td></td>
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<tr>
<td>With PCE</td>
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<td>Monthly Residential Bill</td>
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<td>Before PCE</td>
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<td>PCE</td>
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<tr>
<td>With PCE</td>
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<tr>
<td>Share of PCE Paid to Each Customer Class</td>
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<tr>
<td>Residential</td>
<td>67%</td>
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</tr>
<tr>
<td>Community</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>13%</td>
<td></td>
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<tr>
<td>PCE Payment Per Customer By Customer Class</td>
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<td></td>
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<tr>
<td>Commercial</td>
<td>$604</td>
<td></td>
</tr>
</tbody>
</table>
### FIGURE 5.2 (part 1)

**PCE IMPACT (PART 1.)**

**ELIM** (HIGH CUSTOMER RESPONSE)

| WITH PCE | WITHOUT PCE | CHANGE
|-----------|-------------|--------|
| 677,326 Sales (KWH) | 398,249 | 279,077 -41.2%
| $315,144 Residential | $147,469 | $167,675 -54.2%
| $201,850 Commercial | $174,532 | $27,318 -13.4%
| $131,178 Community | $47,697 | $83,481 -63.1%
| 29,354 Government | 20,581 | 8,773 -42.5%
| 0 Other | 0 | 0 ERR

| WITH PCE | WITHOUT PCE | CHANGE
|-----------|-------------|--------|
| $279,065 EXPENSES ($) | $254,005 | $25,060 -9.2%
| $62,230 Fuel | $35,000 | $27,230 -77.8%
| $174,012 Non Fuel | $174,312 | $0 0.0%
| $42,432 Other | $42,432 | $0 0.0%
| 0 Cost / Kwh | 0 | 0 ERR

| WITH PCE | WITHOUT PCE | CHANGE
|-----------|-------------|--------|
| $279,065 REVENUES ($) | $208,866 | ($60,199 -25.3%
| $69,602 Residential | $77,359 | $7,757 10.8%
| $73,030 Commercial | $91,544 | $18,514 20.4%
| $22,926 Community | $25,002 | $2,076 8.2%
| 0 Government | $14,841 | $25,858 23.5%
| 0 Other | $0 | $0 ERR
| 0 PCE | 0 | 0 ERR

| 0.4% PCE / REVENUES Dependency Ratio

| AVG PRICE / KWH
| Residential | $0.52 | $0.34 177.3% 20%
| Commercial | $0.52 | $0.36 148.8% 20%
| Community | $0.52 | $0.36 212.2% 20%
| Government | $0.52 | $0.11 27.6% 10%
| Other | $0.52 | $0.11 27.6% 10%

| HOUSEHOLD DATA
| Residential | 717 | 74 | 1999 Census
| Commercial | 32,242 | 32,242 | 1990 Census
| $74 Electric Bill / Res Cust | $1,031 | $237 29.8% Includes Residential Only
| $1,089 Electric Cost / Res Cust | $1,353 | $276 25.4% Residential, Community Facility, Other, and D
| 2.5% Electric Bill Share of Income | 3.2% | 0.7% 29.8% Includes Residential Only
| 3.4% Electric Cost Share of Income | 4.2% | 0.5% 25.4% Residential, Community Facility, Other, and D
| 4,202 Annual Use Per Res Cust | 1,867 | (2,335) -53.2% Includes Residential Only
| 109 Monthly Use Per Res Cust | 464 | (180) -63.2% Includes Residential Only

(pcerep2.wpd) November 16, 1998 5.10
**FIGURE 5.2 (part 2)**

### PCE IMPACT (PART 2.): COMMUNITY IMPACT

**ELIM (HIGH CUSTOMER RESPONSE)**

<table>
<thead>
<tr>
<th>Households</th>
<th>Total Household Income</th>
<th>Direct Financial Burden from PCE Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>If All Burden by Community</td>
</tr>
<tr>
<td>Residential</td>
<td>$17,757</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>$18,514</td>
<td></td>
</tr>
<tr>
<td>Community Facility</td>
<td>$2,064</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>$2,658</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td>$45,119</td>
<td></td>
</tr>
</tbody>
</table>

**Direct Financial Burden from PCE Loss**

<table>
<thead>
<tr>
<th>Amount Shifted Outside Community</th>
<th>74</th>
<th>$17,757</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$6,109</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>$17,211</td>
<td></td>
</tr>
<tr>
<td>Community Facility</td>
<td>$2,064</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>$2,658</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td>$45,119</td>
<td></td>
</tr>
</tbody>
</table>

Percent Decline in HH Income from PCE Loss

3.6%

Amount Shifted Outside Community

$15,292
FIGURE 5.2 (part 3)

PCE IMPACT (PART 3.) : FIGURES

ECONOMIC SIGNIFICANCE

5.12
### FIGURE 5.2 (part 4)

#### PCE IMPACT (PART 4.):
COMMUNITY AND UTILITY CHARACTERISTICS

ELIM (HIGH CUSTOMER RESPONSE)

<table>
<thead>
<tr>
<th>Utility</th>
<th>Elim</th>
<th>AVEC</th>
<th>MEDIAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>281</td>
<td>264</td>
<td></td>
</tr>
<tr>
<td>KWH Sold</td>
<td>677,326</td>
<td>651,507</td>
<td></td>
</tr>
<tr>
<td>Fuel Price Per Gallon</td>
<td>$1.08</td>
<td>$1.14</td>
<td></td>
</tr>
<tr>
<td>Share of KWH Generated That Are Eligible For PCE</td>
<td>65.1%</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>Utility Dependency Ratio (PCE Payment / Total Revenues)</td>
<td>40.4%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>PCE Payment Calculated By Formula</td>
<td>$112,901</td>
<td></td>
<td>$71,883</td>
</tr>
<tr>
<td>PCE Payment Calculated By Formula Per HH</td>
<td>$1,528</td>
<td>$1,059</td>
<td></td>
</tr>
<tr>
<td>PCE Payment Per Eligible KWH (Cents)</td>
<td>24.5</td>
<td>22.4</td>
<td></td>
</tr>
<tr>
<td>Residential KWH Per Customer (Annual)</td>
<td>4,202</td>
<td>3,921</td>
<td></td>
</tr>
<tr>
<td>Portion of Residential Sales Eligible For PCE</td>
<td>91.4%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Residential Share of Total Utility KWH Sales</td>
<td>46.5%</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>Residential Rate Per PCE Eligible KWH Before PCE</td>
<td>41.3</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>PCE</td>
<td>24.2</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>With PCE</td>
<td>17.1</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Monthly Residential Bill Before PCE</td>
<td>$145</td>
<td>$121</td>
<td></td>
</tr>
<tr>
<td>PCE</td>
<td>$78</td>
<td>$64</td>
<td></td>
</tr>
<tr>
<td>With PCE</td>
<td>$66</td>
<td>$66</td>
<td></td>
</tr>
<tr>
<td>Share of PCE Paid To Each Customer Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>62%</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>25%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>9%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>PCE Payment Per Customer By Customer Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>$941</td>
<td>$660</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>$4,691</td>
<td>$1,862</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>$1,139</td>
<td>$604</td>
<td></td>
</tr>
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</table>

November 16, 1998  5.13
FIGURE 5.3 (part 1)

PCE IMPACT (PART 1.)

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SALES (KWH)</strong></td>
<td><strong>SALES (KWH)</strong></td>
<td><strong>AMOUNT</strong></td>
</tr>
<tr>
<td>26,039,748</td>
<td>25,457,496</td>
<td>582,252</td>
</tr>
<tr>
<td>Residential</td>
<td>8,494,837</td>
<td>8,911,512</td>
</tr>
<tr>
<td>Commercial</td>
<td>12,922,797</td>
<td>12,470,204</td>
</tr>
<tr>
<td>Community Facility</td>
<td>1,763,500</td>
<td>1,652,176</td>
</tr>
<tr>
<td>Government</td>
<td>2,958,813</td>
<td>2,953,583</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>EXPENSES ($)</strong></th>
<th><strong>EXPENSES ($)</strong></th>
<th><strong>AMOUNT</strong></th>
<th><strong>%</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>$5,103,796</td>
<td>$5,075,494</td>
<td>($28,304)</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Fuel</td>
<td>$1,265,819</td>
<td>$1,237,515</td>
<td>$28,304</td>
</tr>
<tr>
<td>Non Fuel</td>
<td>$2,723,202</td>
<td>$2,723,202</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>$1,144,777</td>
<td>$1,144,777</td>
<td>0</td>
</tr>
<tr>
<td>Cost / Kwh</td>
<td>$0.20</td>
<td>$0.20</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REVENUES ($)</strong></th>
<th><strong>REVENUES ($)</strong></th>
<th><strong>AMOUNT</strong></th>
<th><strong>%</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>$5,103,796</td>
<td>$5,074,494</td>
<td>($29,305)</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Residential</td>
<td>$1,381,576</td>
<td>$1,616,884</td>
<td>$235,308</td>
</tr>
<tr>
<td>Commercial</td>
<td>$2,476,263</td>
<td>$2,535,534</td>
<td>$59,271</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$297,180</td>
<td>$329,331</td>
<td>$32,151</td>
</tr>
<tr>
<td>Government</td>
<td>$579,888</td>
<td>$588,744</td>
<td>$8,856</td>
</tr>
<tr>
<td>Other</td>
<td>$9</td>
<td>$9</td>
<td>0</td>
</tr>
<tr>
<td>PCE</td>
<td>$9</td>
<td>$9</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>BALANCE (S1,001)</strong></th>
<th>($1,001)</th>
</tr>
</thead>
</table>

7.8% PCE / REVENUES

Dependency Ratio

<table>
<thead>
<tr>
<th>AVG PRICE / KWH</th>
<th>Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$0.20</td>
</tr>
<tr>
<td>Commercial</td>
<td>$0.20</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$0.20</td>
</tr>
<tr>
<td>Government</td>
<td>$0.20</td>
</tr>
<tr>
<td>Other</td>
<td>$0.20</td>
</tr>
</tbody>
</table>

HOUSEHOLD DATA

<table>
<thead>
<tr>
<th>1119</th>
<th>1119</th>
</tr>
</thead>
<tbody>
<tr>
<td>HiH</td>
<td>IncomeHh</td>
</tr>
<tr>
<td>$63,993</td>
<td>$63,993</td>
</tr>
<tr>
<td>E675</td>
<td>Electric Bill / Res Cost</td>
</tr>
<tr>
<td>$1,141</td>
<td>$1,373</td>
</tr>
<tr>
<td>$1,164</td>
<td>Electric Cost / Res Cost</td>
</tr>
<tr>
<td>$1,141</td>
<td>$1,373</td>
</tr>
<tr>
<td>1.5%</td>
<td>Electric Bill Share of Income</td>
</tr>
<tr>
<td>1.6%</td>
<td>0.3%</td>
</tr>
<tr>
<td>1.8%</td>
<td>Electric Cost Share of Income</td>
</tr>
<tr>
<td>2.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>5,995</td>
<td>Annual Use Per Res Cust</td>
</tr>
<tr>
<td>5,724</td>
<td>(271)</td>
</tr>
<tr>
<td>500</td>
<td>Monthly Use Per Res Cust</td>
</tr>
<tr>
<td>477</td>
<td>(23)</td>
</tr>
</tbody>
</table>

1990 Census
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
### PCE Impact (Part 2) - Community Impact

**Nome**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Total Household Income</th>
<th>Direct Financial Burden from PCE Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>1119</td>
<td>$71,007,026</td>
<td>$370,576</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If All Borne by Community</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td>$295,200</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td>$93,271</td>
</tr>
<tr>
<td>Community Facility</td>
<td></td>
<td></td>
<td>$92,143</td>
</tr>
<tr>
<td>Government</td>
<td></td>
<td></td>
<td>$8,855</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>$0</td>
</tr>
<tr>
<td>Balance</td>
<td></td>
<td></td>
<td>$1,501</td>
</tr>
</tbody>
</table>

Direct Financial Burden from PCE Loss if Some Shifted Outside Community

<table>
<thead>
<tr>
<th>Local Burden Share</th>
<th>Percentage</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>100%</td>
<td>$235,200</td>
</tr>
<tr>
<td>Commercial</td>
<td>33%</td>
<td>$70,879</td>
</tr>
<tr>
<td>Community Facility</td>
<td>100%</td>
<td>$92,143</td>
</tr>
<tr>
<td>Government</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td>Other</td>
<td>100%</td>
<td>$0</td>
</tr>
<tr>
<td>Balance</td>
<td>100%</td>
<td>$1,501</td>
</tr>
</tbody>
</table>

Percent Decline in HH Income from PCE Loss: 0.4%

Amount Shifted Outside Community: $51,247
FIGURE 5.3 (part 3)

PCE IMPACT (PART 3.) : FIGURES

NOME

ELECTRICITY RATES

NOME

$0.25

$0.20

$0.15

$0.10

$0.05

$0.00

Residential

Community

Commercial

Govt.

Other

AVG WITH PCE

PUBLISHED RATE

WITHOUT PCE

REPLACEMENT OF PCE LOSS

NOME

$500

$400

$300

$200

$100

$0

WITH PCE

NO PCE

PCE

REDUCED FUEL EXPENDITURES

RESIDENTIAL RATES

NON-RESIDENTIAL RATES

AVERAGE RESIDENTIAL BILL

NOME

$1,200

$1,000

$800

$600

$400

$200

$0

WITH PCE

NO PCE

AVERAGE RESIDENTIAL USE

NOME

0

2

4

6

WITH PCE

NO PCE

AVG

WITH PCE

PUBLISHED RATE

WITHOUT PCE
FIGURE 5.3 (part 4)

PCE IMPACT (PART 4.)
COMMUNITY AND UTILITY CHARACTERISTICS

<table>
<thead>
<tr>
<th>UTILITY</th>
<th>Nome</th>
<th>Joint Util</th>
<th>MEDIAN PCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>POPULATION</td>
<td>3,984</td>
<td>264</td>
<td></td>
</tr>
<tr>
<td>KWH SOLD</td>
<td>26,039,746</td>
<td>651,507</td>
<td></td>
</tr>
<tr>
<td>FUEL PRICE PER GALLON</td>
<td>$0.71</td>
<td>$1.14</td>
<td></td>
</tr>
<tr>
<td>SHARE OF KWH GENERATED THAT ARE ELIGIBLE FOR PCE</td>
<td>33.3%</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>UTILITY DEPENDENCY RATIO (PCE PAYMENT / TOTAL REVENUES)</td>
<td>7.8%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>PCE PAYMENT CALCULATED BY FORMULA</td>
<td>$398,880</td>
<td>$71,353</td>
<td></td>
</tr>
<tr>
<td>PCE PAYMENT CALCULATED BY FORMULA PER HH</td>
<td>$356</td>
<td>$1,059</td>
<td></td>
</tr>
<tr>
<td>PCE PAYMENT PER ELIGIBLE KWH (CENTS)</td>
<td>4.6</td>
<td>22.4</td>
<td></td>
</tr>
<tr>
<td>RESIDENTIAL KWH PER CUSTOMER (ANNUAL)</td>
<td>5,995</td>
<td>3,921</td>
<td></td>
</tr>
<tr>
<td>PORTION OF RESIDENTIAL SALES ELIGIBLE FOR PCE</td>
<td>72.5%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>RESIDENTIAL SHARE OF TOTAL UTILITY KWH SALES</td>
<td>32.6%</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>RESIDENTIAL RATE PER PCE ELIGIBLE KWH BEFORE PCE</td>
<td>19.6</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>PCE</td>
<td>5.0</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>WITH PCE</td>
<td>14.6</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>MONTHLY RESIDENTIAL BILL BEFORE PCE</td>
<td>$98</td>
<td>$121</td>
<td></td>
</tr>
<tr>
<td>PCE</td>
<td>$17</td>
<td>$64</td>
<td></td>
</tr>
<tr>
<td>WITH PCE</td>
<td>$81</td>
<td>$66</td>
<td></td>
</tr>
<tr>
<td>SHARE OF PCE PAID TO EACH CUSTOMER CLASS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESIDENTIAL</td>
<td>71%</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>COMMUNITY</td>
<td>20%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL</td>
<td>9%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>PCE PAYMENT PER CUSTOMER BY CUSTOMER CLASS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESIDENTIAL</td>
<td>$300</td>
<td>$666</td>
<td></td>
</tr>
<tr>
<td>COMMUNITY</td>
<td>$1,825</td>
<td>$1,852</td>
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</tr>
<tr>
<td>COMMERCIAL</td>
<td>$163</td>
<td>$804</td>
<td></td>
</tr>
</tbody>
</table>
# FIGURE 5.4 (part 1)

## PCE IMPACT (PART 1.)

### SHAGELUK

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>254,291 SALES (KWH)</td>
<td>129,612</td>
<td>124,470</td>
<td>-40.6%</td>
</tr>
<tr>
<td>124,119 Residential</td>
<td>43,149</td>
<td>80,970</td>
<td>-45.2%</td>
</tr>
<tr>
<td>80,049 Commercial</td>
<td>71,084</td>
<td>8,965</td>
<td>-11.4%</td>
</tr>
<tr>
<td>40,093 Community Facility</td>
<td>15,359</td>
<td>24,734</td>
<td>-62.2%</td>
</tr>
<tr>
<td>0 Government</td>
<td>0</td>
<td>0</td>
<td>ERR</td>
</tr>
<tr>
<td>0 Other</td>
<td>0</td>
<td>0</td>
<td>ERR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENSES ($)</th>
<th>REVENUES ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$94,290 SD1</td>
<td>$54,337 SD1</td>
</tr>
<tr>
<td>$28,505 Fuel</td>
<td>$14,505 Fuel</td>
</tr>
<tr>
<td>$65,698 Non Fuel</td>
<td>$65,698 Non Fuel</td>
</tr>
<tr>
<td>$9  Other</td>
<td>$9 Other</td>
</tr>
<tr>
<td>$9.37 Cost / Kwh</td>
<td>$5.62 Cost / Kwh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REVENUES ($)</th>
<th>BALANCE ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$54,337 SD1</td>
<td>($25,973)</td>
</tr>
<tr>
<td>$12,210 Residential</td>
<td>$18,089 Residential</td>
</tr>
<tr>
<td>$21,397 Commercial</td>
<td>$28,792 Commercial</td>
</tr>
<tr>
<td>$4,899 Community Facility</td>
<td>$6,456 Community Facility</td>
</tr>
<tr>
<td>$0 Government</td>
<td>$0 Government</td>
</tr>
<tr>
<td>$0 Other</td>
<td>$0 Other</td>
</tr>
<tr>
<td>$55,984 PCE</td>
<td>0 PCE</td>
</tr>
<tr>
<td>$0 BALANCE</td>
<td>($25,973)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AVG PRICE / KWH</th>
<th>Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.10 Residential</td>
<td>$0.42</td>
</tr>
<tr>
<td>$0.27 Commercial</td>
<td>$0.42</td>
</tr>
<tr>
<td>$0.09 Community Facility</td>
<td>$0.42</td>
</tr>
<tr>
<td>$0.37 Government</td>
<td>$0.42</td>
</tr>
<tr>
<td>$0.37 Other</td>
<td>$0.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HOUSEHOLD DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 HH</td>
</tr>
<tr>
<td>$34,457 IncomeHH</td>
</tr>
<tr>
<td>$34,457</td>
</tr>
<tr>
<td>$320 Electric Bill / Res Cust</td>
</tr>
<tr>
<td>$489</td>
</tr>
<tr>
<td>$457 Electric Cost / Res Cust</td>
</tr>
<tr>
<td>$663</td>
</tr>
<tr>
<td>1.0% Electric Bill Share of Income</td>
</tr>
<tr>
<td>1.4%</td>
</tr>
<tr>
<td>1.3% Electric Cost Share of Income</td>
</tr>
<tr>
<td>1.3%</td>
</tr>
<tr>
<td>3,355 Annual Use Per Res Cust</td>
</tr>
<tr>
<td>1,168</td>
</tr>
<tr>
<td>280 Monthly Use Per Res Cust</td>
</tr>
<tr>
<td>97</td>
</tr>
</tbody>
</table>

1990 Census 1600 Census

Includes Residential Only Includes Residential, Community Facility, Other, and Deficit

Includes Residential Only Includes Residential, Community Facility, Other, and Deficit

Includes Residential Only

<table>
<thead>
<tr>
<th>1039 Census</th>
<th>1990 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 HH</td>
<td>39 HH</td>
</tr>
<tr>
<td>$34,457 IncomeHH</td>
<td>$34,457 IncomeHH</td>
</tr>
<tr>
<td>$159 Electric Bill / Res Cust</td>
<td>$208 Electric Cost / Res Cust</td>
</tr>
<tr>
<td>1.4% Electric Bill Share of Income</td>
<td>1.3% Electric Cost Share of Income</td>
</tr>
<tr>
<td>1,168 Annual Use Per Res Cust</td>
<td>97 Monthly Use Per Res Cust</td>
</tr>
</tbody>
</table>

| 5.18 |

November 16, 1998 (pcerep2.wpd)
### FIGURE 5.4 (part 2)

**PCE Impact (Part 2): Community Impact**

**SHAGELUK**

<table>
<thead>
<tr>
<th>Households</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Household Income</td>
<td>$1,343,818</td>
</tr>
</tbody>
</table>

**Direct Financial Burden from PCE Loss**

If All Borne by Community

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount (in $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$5,880</td>
</tr>
<tr>
<td>Commercial</td>
<td>$8,395</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$1,758</td>
</tr>
<tr>
<td>Government</td>
<td>$0</td>
</tr>
<tr>
<td>Other</td>
<td>$0</td>
</tr>
<tr>
<td>Balance</td>
<td>$25,973</td>
</tr>
</tbody>
</table>

**Direct Financial Burden from PCE Loss**

If Some Shifted Outside Community

<table>
<thead>
<tr>
<th>Local Burden Share</th>
<th>Amount (in $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>100%</td>
</tr>
<tr>
<td>Commercial</td>
<td>33%</td>
</tr>
<tr>
<td>Community Facility</td>
<td>100%</td>
</tr>
<tr>
<td>Government</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>100%</td>
</tr>
<tr>
<td>Balance</td>
<td>100%</td>
</tr>
</tbody>
</table>

| Percent Decline in HH Income from PCE Loss | 2.7% |
| Amount Shilted Outside Community         | $5,625 |
FIGURE 5.4 (part 3)

PCE IMPACT (PART 3): FIGURES
SHAGELUK

ELECTRICITY RATES

SHAGELUK

Residential Commercial Govt Other

$0.50

$0.40

$0.30

$0.20

$0.10

$0.00

RESIDENTIAL COMMERCIAL

AVG WITH PCE PUBLISHED RATE WITHOUT PCE

REPLACEMENT OF PCE LOSS

SHAGELUK

$60

$40

$20

$0

WITH PCE NO PCE

PCE REDUCED FUEL EXPENDITURES
RESIDENTIAL RATES NON-RESIDENTIAL RATES

AVERAGE RESIDENTIAL BILL

SHAGELUK

$500

$400

$300

$200

$0

WITH PCE NO PCE

AVERAGE RESIDENTIAL USE

SHAGELUK

WITH PCE NO PCE

No REDUCED FUEL EXPENDITURES
RESIDENTIAL RATES NON-RESIDENTIAL RATES
### FIGURE 5.4 (part 4)

**PCE IMPACT (PART 4): COMMUNITY AND UTILITY CHARACTERISTICS**

**SHAGELUK**

<table>
<thead>
<tr>
<th>Utility</th>
<th>Shageluk AVEC</th>
<th>Median PCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>144</td>
<td>264</td>
</tr>
<tr>
<td><strong>KWH Sold</strong></td>
<td>254,361</td>
<td>651,507</td>
</tr>
<tr>
<td><strong>Fuel Price per Gallon</strong></td>
<td>$1.11</td>
<td>$1.14</td>
</tr>
<tr>
<td><strong>Share of KWH Generated That Are Eligible for PCE</strong></td>
<td>79.6%</td>
<td>57%</td>
</tr>
<tr>
<td><strong>Utility Dependency Ratio (PCE Payment / Total Revenues)</strong></td>
<td>59.4%</td>
<td>31%</td>
</tr>
<tr>
<td><strong>PCE Payment Calculated by Formula</strong></td>
<td>$55,084</td>
<td>$71,363</td>
</tr>
<tr>
<td><strong>PCE Payment Calculated by Formula per HH</strong></td>
<td>$1,435</td>
<td>$1,059</td>
</tr>
<tr>
<td><strong>PCE Payment per Eligible KWH (Cents)</strong></td>
<td>27.7</td>
<td>22.4</td>
</tr>
<tr>
<td><strong>Residential KWH per Customer (Annual)</strong></td>
<td>3,355</td>
<td>3,921</td>
</tr>
<tr>
<td><strong>Portion of Residential Sales Eligible for PCE</strong></td>
<td>98.4%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Residential Share of Total Utility KWH Sales</strong></td>
<td>48.0%</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Residential Rate per PCE Eligible KWH Before PCE</strong></td>
<td>37.1</td>
<td>42</td>
</tr>
<tr>
<td><strong>PCE</strong></td>
<td>27.0</td>
<td>22</td>
</tr>
<tr>
<td><strong>With PCE</strong></td>
<td>10.0</td>
<td>17</td>
</tr>
<tr>
<td><strong>Monthly Residential Bill</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Before PCE</strong></td>
<td>$104</td>
<td>$121</td>
</tr>
<tr>
<td><strong>PCE</strong></td>
<td>$76</td>
<td>$64</td>
</tr>
<tr>
<td><strong>With PCE</strong></td>
<td>$27</td>
<td>$69</td>
</tr>
<tr>
<td><strong>Share of PCE Paid to Each Customer Class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td>69%</td>
<td>67%</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>23%</td>
<td>19%</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td>18%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>PCE Payment per Customer by Customer Class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td>$915</td>
<td>$600</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>$2,770</td>
<td>$1,862</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td>$1,676</td>
<td>$804</td>
</tr>
</tbody>
</table>

November 16, 1998
6. ELIMINATION OF THE POWER COST EQUALIZATION PROGRAM--AGGREGATE EFFECTS ON UTILITIES AND CUSTOMERS

ALL PCE UTILITIES

The effect of elimination of Power Cost Equalization (PCE) would be different for each community. We can however characterize and summarize the total effect of elimination of PCE by aggregating all the PCE utilities together and treating them as one utility. The analysis in this section is based on information for fiscal year 1996 for utilities providing complete information and the following assumptions:

1. The price elasticity of demand for electricity among residential, community facility, and commercial customers is -.2. Elasticity is -.1 (sales are less sensitive to rates) for government and "other" customers.
2. No customers switch to self generation at higher rates.
3. Fuel expenses are the only variable cost for utilities.

Figure 6.1, part 1 shows that with the termination of $14.747 million of PCE payments to the residential rate for the average household increases from 18 to 33 cents, 80 percent. Residential sales fall by 18 percent and the typical electric bill increases by 47 percent. The typical household is spending 2.9 percent of its income for 337 kwh per month. Including the cost of electricity for the operation of community facilities, the typical household is paying 3.6 percent of its income for electricity generation, in spite of the fact that community facility usage falls 25 percent. The average household cost of electricity, including community facilities, is $1,682.

Total sales falls by 10 percent but expenses fall by only 3 percent because the only variable cost is fuel. Consequently the cost of generation increases from 29 cents per kwh to 31 cents, an increase of 7 percent.

Most of the loss of $14.747 million of PCE payments, $9.901 million, represents a loss in purchasing power from the residents of the PCE communities. $7.039 million is taken from residential customers, $6.830 million directly through higher bills, and $.209 million in the recovery of deficits for utilities facing a "death spiral". $3.368 million is taken from commercial customers, of which we assume 1/3 is paid by local residents and 2/3 is shifted outside the effected communities. $1.729 million is paid by community facilities, which is passed back in higher bills and taxes to local residents. $.467 million is paid by the state and federal

---

10 This analysis is based on the 134 utilities for which complete information is available for 1996.
government and the "other" category of customers. $2.353 million of the loss in PCE payments is absorbed through reductions in fuel purchases.

The residential impact is different for each of the utilities. For several the reduction in residential use is less than 20 percent while the increase in cost is less than 60 percent. At the other extreme a few have a reduction in residential use of over 60 percent with an increase in cost of nearly 60 percent. For a large share of the utilities the residential impact is a reduction in electricity use between 20 percent and 60 percent with an increase in cost of more than 60 percent (Figure 6.2).

OVERVIEW EXCLUDING THE LARGEST PCE UTILITIES

Excluding the 5 largest PCE utilities from the analysis (Nome, Kotzebue, Naknek, Nushagak, and Tok)\textsuperscript{11}, the impact of the termination of PCE payments is more pronounced (Figure 6.3).

With elimination of $12.747 million of PCE payments (excluding the 5 largest PCE utilities) the average residential rate increases from 19 to 40 cents, 107 percent. Residential sales now fall by 24 percent and the typical electric bill increases by 57 percent. The typical household is spending 3.3 percent of its income for 277 kwh per month. Including the cost of electricity for the operation of community facilities, the typical household is paying 4.3 percent of its income for electricity generation, in spite of the fact that community facility usage falls 30 percent. The average household cost for electricity, including community facilities, is $1,745.

Total sales falls by 14 percent but expenses fall by only 4 percent because the only variable cost is fuel. Consequently the cost of generation increases from 35 cents per kwh to 39 cents, an increase of 11 percent.

DISTRIBUTION OF EFFECTS

The pattern of the distribution of effects of termination of PCE across communities can be seen from a set of graphs generated from this aggregate analysis.

Residential electricity rates rise in all communities with the termination of the PCE. The increase is modest in a few communities, but double or triple in many. For most communities the residential rate after termination of PCE is more than $.40. There is little relation between the rates before and after termination of PCE (Figure 6.4A and 6.4B).

Residential consumption per customer falls in each community with the rate increase, but

\textsuperscript{11} Data for three large utilities--Bethel, Unalaska, and Cordova--was incomplete and these were among the utilities excluded from this aggregate analysis.
the percent reductions in use are smaller than the percent rate increases. This reflects the assumption that use is relatively insensitive to the electricity price because electricity is important to the consumer, particularly at low levels of use (Figure 6.5).

In spite of reduced consumption residential electricity bills rise with the termination of PCE. The increase is generally proportional to the size of the bill before PCE termination but there is considerable variation across utilities (Figure 6.6).

The number of utilities the fall into a “death spiral” is small, as indicated by an operating deficit after adjusting to a lower level of operations (Figure 6.7).

One measure of loss to the community from the termination of the PCE is the loss of purchasing power associated with higher electricity rates. Figure 6.8 shows the distribution of that loss across utilities as well as how it is distributed among the various classes of customers. For most communities the loss is less than $100 thousand, but in virtually all cases the direct burden falls mostly on households.

Another measure of the burden of the termination of the PCE is the share of household income that is devoted to paying for electricity, including both the direct burden from a higher residential rate, and the indirect burden from a higher community facility rate. Figure 6.9 shows that this burden exceeds 15 percent in two communities and is greater than 5 percent in almost half. It is less than 2.5 percent in only about 20 percent of the communities.

FINANCIALLY VULNERABLE UTILITIES

Using the residual operating deficit after adjustment as the measure, only a handful of utilities appear to be financially vulnerable to the termination of the PCE program, if we assume that customer use of electricity is very insensitive to rates (price elasticity of -.2). As discussed in Section 4 of this report there may well be reason to believe that utility electricity demand many be more sensitive than this for several reasons.

First, the residential rate increases projected with the termination of the PCE program are outside the range of current rates that residential consumers face. The response to a doubling or tripling of the electricity rate could be qualitatively different from that of a smaller increase. This is particularly the case the larger the share of income that is allocated to paying for electricity. Second, some residential customers might choose to drop their utility connection altogether. Finally, some customers, most likely commercial or community facility customers, might choose to self generate. All of these factors suggest that the sensitivity of electricity sales to rate increases might be higher than -.2.

In order to investigate the sensitivity of PCE utilities in the aggregate to the assumption of the sensitivity of sales to price, we calculated the impact using -.3 as the price elasticity assumption for residential, community facility, and commercial sales. The result was a dramatic increase in the number of utilities that fell into a “death spiral” and were unable to adjust their
generation and rates to cover their costs. Figure 6.10 shows that 71 of the 134 utilities\textsuperscript{12} were unable to avoid an aggregate deficit of $2.440 million. Figure 6.11 shows that for most of these financial vulnerable utilities the deficit represented more than 10 percent of their non-fuel expenses and consequently a significant share of their total expenses.

A strict interpretation of these results is that about half the PCE communities would lose utility electricity without some alternative source of external assistance. Because the analysis is aggregate, and we have been unable to review the results for each of the 134 individual communities, we conclude that the utilities in the aggregate are very vulnerable financially to the termination of the PCE program.

Figure 6.12 provides a summary of the aggregate effects in this case. The results net of the 5 largest utilities are reported in Figure 6.13.

\textsuperscript{12} This is all the communities for which complete information for 1996 was available.
#### FIGURE 6.1 (part 1)

**PCE IMPACT (PART 1.)**

**ALL PCE UTILITIES**

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AMOUNT</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>227,245,209</td>
<td>205,339,824</td>
<td>21,905,385</td>
</tr>
<tr>
<td>79,417,373</td>
<td>65,039,496</td>
<td>14,377,877</td>
</tr>
<tr>
<td>95,833,636</td>
<td>82,036,696</td>
<td>13,796,940</td>
</tr>
<tr>
<td>18,185,022</td>
<td>13,713,074</td>
<td>4,471,948</td>
</tr>
<tr>
<td>26,549,517</td>
<td>26,407,146</td>
<td>141,371</td>
</tr>
<tr>
<td>5,260,092</td>
<td>5,252,433</td>
<td>7,665</td>
</tr>
</tbody>
</table>

**WITH PCE**

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>227,245,209</td>
<td>205,339,824</td>
<td>21,905,385</td>
</tr>
<tr>
<td>79,417,373</td>
<td>65,039,496</td>
<td>14,377,877</td>
</tr>
<tr>
<td>95,833,636</td>
<td>82,036,696</td>
<td>13,796,940</td>
</tr>
<tr>
<td>18,185,022</td>
<td>13,713,074</td>
<td>4,471,948</td>
</tr>
<tr>
<td>26,549,517</td>
<td>26,407,146</td>
<td>141,371</td>
</tr>
<tr>
<td>5,260,092</td>
<td>5,252,433</td>
<td>7,665</td>
</tr>
</tbody>
</table>

**EXPENSES ($)**

| EXPENSES ($) | $66,488,447 | $64,344,587 | ($2,143,860) | -3.2% |

**REVENUES ($)**

| REVENUES ($) | $66,488,447 | $64,344,587 | ($2,143,860) | -3.2% |

**AVG PRICE / KWH**

<table>
<thead>
<tr>
<th>AVG PRICE / KWH</th>
<th>Residential</th>
<th>$0.18</th>
<th>$0.33</th>
<th>$0.15</th>
<th>79.3%</th>
<th>20%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commercial</td>
<td>$0.26</td>
<td>$0.31</td>
<td>$0.04</td>
<td>10.6%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Community Facility</td>
<td>$0.28</td>
<td>$0.35</td>
<td>$0.18</td>
<td>100.7%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Government</td>
<td>$0.28</td>
<td>$0.30</td>
<td>$0.02</td>
<td>6.1%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>$0.10</td>
<td>$0.15</td>
<td>$0.00</td>
<td>2.5%</td>
<td>10%</td>
</tr>
</tbody>
</table>

**HOUSEHOLD DATA**

<table>
<thead>
<tr>
<th>HOUSEHOLD DATA</th>
<th>HH</th>
<th>1990 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH</td>
<td>13,055</td>
<td>13,055</td>
</tr>
<tr>
<td>Income/HH</td>
<td>$45,120</td>
<td>$40,120</td>
</tr>
<tr>
<td>Electric Bill / Res Cost</td>
<td>$1,500</td>
<td>$424</td>
</tr>
<tr>
<td>Electric Cost / Res Cost</td>
<td>$1,682</td>
<td>$533</td>
</tr>
<tr>
<td>1.9% Electric Bill Share of Income</td>
<td>0.9%</td>
<td>47.3%</td>
</tr>
<tr>
<td>2.6% Electric Cost Share of Income</td>
<td>1.2%</td>
<td>46.4%</td>
</tr>
<tr>
<td>Annual Use Per Res Cost</td>
<td>4,040</td>
<td>(994)</td>
</tr>
<tr>
<td>Monthly Use Per Res Cost</td>
<td>337</td>
<td>(14)</td>
</tr>
</tbody>
</table>
FIGURE 6.1 (part 2)

PCE IMPACT (PART 2.) : COMMUNITY IMPACT

<table>
<thead>
<tr>
<th></th>
<th>Households</th>
<th>Total Household Income</th>
<th>Direct Financial Burden from PCE Loss If All Borne by Community</th>
<th>All PCE Utilities</th>
<th>Direct Financial Burden from PCE Loss If Some Shifted Outside Community</th>
<th>Local Burden Share</th>
<th>Percent Decline in Household Income from PCE Loss</th>
<th>Amount Shifted Out of Community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10,055</td>
<td>$602,100,503</td>
<td>$12,303,630</td>
<td>$9,901,448</td>
<td>$6,829,660</td>
<td>1.6%</td>
<td>$2,701,365</td>
<td>Commercial $2,556,259</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Residential</td>
<td></td>
<td>100%</td>
<td>$6,829,660</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Commercial</td>
<td>33%</td>
<td>$1,111,202</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community Facility</td>
<td>100%</td>
<td>$1,728,944</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Government</td>
<td>0%</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other</td>
<td>100%</td>
<td>$22,357</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Balance</td>
<td>100%</td>
<td>$209,193</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Residential                     $6,829,660
Commercial                     $3,367,551
Community Facility                $1,728,944
Government                           $0
Other                                    $22,357
Balance                                $209,193
FIGURE 6.2

RESIDENTIAL IMPACT OF PCE LOSS
EACH DOT IS ONE UTILITY

% INCREASE IN COST

% LOSS OF ELECTRICITY
### FIGURE 6.3 (part 1)

#### PCE IMPACT (PART 1.)

ALL BUT 5 LARGEST PCE UTILITIES

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALES (KWH)</td>
<td>118,548,381</td>
<td>18,873,917</td>
</tr>
<tr>
<td>137,422,298</td>
<td>118,548,381</td>
<td>18,873,917</td>
</tr>
<tr>
<td>Residential</td>
<td>39,013,445</td>
<td>12,372,777</td>
</tr>
<tr>
<td>Commercial</td>
<td>50,484,324</td>
<td>2,437,385</td>
</tr>
<tr>
<td>Community Facility</td>
<td>9,024,603</td>
<td>3,848,143</td>
</tr>
<tr>
<td>Government</td>
<td>14,773,576</td>
<td>103,273</td>
</tr>
<tr>
<td>Other</td>
<td>5,252,433</td>
<td>7,559</td>
</tr>
<tr>
<td>EXPENSES ($)</td>
<td>45,729,387</td>
<td>45,729,387</td>
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<td>Other</td>
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<td>REVENUES ($)</td>
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<tr>
<td>BALANCE</td>
<td>($208,358)</td>
<td>($208,358)</td>
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</table>

#### AVG PRICE / KWH

| 0.19 | Residential | $0.40 | $0.21 | 106.8% | 20% |
| 0.33 | Commercial | $0.39 | $0.07 | 33.8% | 20% |
| 0.18 | Community Facility | $0.42 | $0.24 | 133.9% | 20% |
| 0.35 | Government | $0.30 | $0.03 | 9.2% | 10% |
| 0.18 | Other | $0.19 | $0.00 | 2.5% | 10% |

#### HOUSEHOLD DATA

| HH | 9,912 | 9,912 |
| Income | $40,271 | $40,271 |
| Electric Bill / Res Cust | $1,334 | $1,334 |
| Electric Cost / Res Cust | $1,745 | $1,745 |
| Electric Bill Share of Income | 3.3% | 3.3% |
| Electric Cost Share of Income | 4.3% | 4.3% |
| Annual Use Per Res Cust | 3,324 | (1,051) | -24.1% |
| Monthly Use Per Res Cust | 277 | (88) | -24.1% |

---

1990 Census
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only
Includes Residential Only

---

(pcerep2.wpd) November 16, 1998 6.10
FIGURE 6.3 (part 2)

PCE IMPACT (PART 2): COMMUNITY IMPACT

ALL BUT 5 LARGEST PCE UTILITIES

Households 9,912
Total Household Income $390,184,048
Direct Financial Burden from PCE Loss $10,551,195
If All Borne by Community

Residential $5,664,689
Commercial $2,806,447
Community Facility $1,475,445
Government $381,560
Other $22,357
Balance $208,358

Direct Financial Burden from PCE Loss Local Burden
If Some Shifted Outside Community $8,171,619 Share

Residential 100% $5,664,689
Commercial 33% $988,827
Community Facility 100% $1,475,445
Government 0% $0
Other 100% $22,357
Balance 100% $208,358

Percent Decline in Household Income from PCE Loss 2.0%
Amount Shifted Outside Community $2,380,579
Commercial $2,097,619
Government $381,960
FIGURE 6.4A (part 1)

RESIDENTIAL RATE WITH PCE AND AFTER ELIMINATION OF PCE (PART 1)
FIGURE 6.4A (part 2)

RESIDENTIAL RATE WITH PCE AND AFTER ELIMINATION OF PCE (PART 2)

$0.00  $0.20  $0.40  $0.60  $0.80

Angoon
Pilot Point Village Council
Atlin Light & Power Company, Inc.
Far North Utilities (Central)
Globus Power Utilities
Beloit
Hibbing Bay
Noovvi
Thorne Bay Public Utility
Toneleil Electric Cooperative, Inc.
Makushack Power Company
H-N-H Electric Cooperative
Sc演xen Bay
Pilot Station
Talkeetna
New Shyshish
Atka
Kiana
Galena, City of
Gambell
Emmonak
China Electric Inc.
Amidé
Shishmaref
Norton Light Plant (Bethlehem)
Savage
Unmak Power Company
Gihan
Nesbitt Lake Electric Cooperative
Nelson Lagoon Electric Cooperative, Inc.
Shavandel Utility Company
Unalaska Power Company (Nestan)
Penpenn, City of
Wales
Mount VVillage
Crooked Creek
Red Devil
Falko Pass Electric Association
Post Hicken, City of
Kwikidak, Inc.
Androod Electric Cooperative (Aff)
Tanana Power Company
Tunkaan Traditional Power Utility
Atalshak Native Community Electric Co.
Seward
Tunutulak Community Service Area
Atmakuk Joint Utilities
Takotna Community Association
GEK, Inc. (Cold Bay)
Hyapakis Electric Utility
Kwig Power Company (Kwigillingok)
Hughes Power & Light
Havel Light & Power
Stony River
St. Paul Municipal Electric Utility
Teller Power Company
Atkik, City of
Atka
Allak Power Utilities
Egegik Light & Power Co
Igiugig Electric Company
Epiget Electric Utility
White Mountain Utilities
Pedro Bay Village Council
Ruby, City of
Sterns Village Energy Systems

SOURCES: ESTIMATED RESIDENTIAL RATE WITH PCE AND AVERAGE RATE AFTER ELIMINATION

November 16, 1998 6.13
FIGURE 6.4B (part 1)

RESIDENTIAL RATE WITH PCE AND AFTER ELIMINATION OF PCE (PART 1)

$0.00  $0.20  $0.40  $0.60  $0.80

Anaktuvuk Pass
Point Lay
Nuiqsut
Kaktovik
Wainwright
Alusak
Point Hope
Hyderburg
Nome Joint Utility System
Nalnek Electric Association, Inc.
Kotzebue Electric Association
Nushagak Electric Cooperative, Inc. (Dillingham)
Yukon Power
Tok (includes Deh Lek)
Thomas Bay Public Utility
Unalakleet Valley Electric Cooperative
Northway Power & Light
Eifa Cove Electric Utility
Chignik Electric
Port Heiden, City of
Perryville, City of
Galena, City of
Kipnuk Light Plant
Menibats
Shishmaref Point, City of
Gwystchyan Trail Utilities (Fort Yukon)
Highways Power Plant
Pilot Point Village Council
St. George Municipal Electric Utility
Talkeetna
ST. Paul Municipal Electric Utility
Tanana Electric Cooperative, Inc.
Talkeetna Traditional Power Utility
Sand Point Electric Company
Kolik Electric Services
Menloak Power Company
Natalie's Light Plant (Chitina)
Chitina Electric Coop.
Kofr
Chitina Valley
GAN, Inc. (Cold Bay)
Heenah
Akhiok, City of
Angoon
Talkeetna Electric Utility
Alak Power Utilities
Andresen Electric Corporation (Aka)
Tonalea Springs
Kasaan
Shageluk
McGill Light & Power
Golovin Power Utilities
Chitina
Tanana Power Company
False Pass Power Association
Kwethluk, Inc.
Alaskan Energy Systems (Atka)
Aniak Electric Company (Dillingham)
Nelson Lagoon Electric Cooperative, Inc.
Arakanuk
Russian Mission
Togiak
Stebbins
White Mountain Utilities
Aniak Light & Power Company, Inc.
Reposnik Light Utility
FIGURE 6.4B (part 2)

RESIDENTIAL RATE WITH PCE AND AFTER ELIMINATION OF PCE (PART 2)

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</table>

November 16, 1998
FIGURE 6.5 (part 1)

RESIDENTIAL CONSUMPTION PER CUSTOMER WITH PCE AND AFTER ELIMINATION OF PCE (PART 1)

Healy Lake
Beaver Joint Utilities
Eagle Power Company
Manby Utility Company
Chuitna Electric
Shageluk
Gustavus Electric Company
Stevens Village Energy Systems
Far North Utilities (Central)
Sheldon Pond, City of
Teilin
Brevig Mission
Huslia
Old Harbor
Seldovia
Alutak Energy Systems (Alaska)
Chevak
Crooked Creek
Tenakee Springs
Hughes Power & Light
Stikine
Unpunaq Power Company (Newtok)
Chevak
Unalak Power Company (Nikolski)
Akiak
Selawik
Akakak Native Community Electric Co.
Grayling
Talkeetna Community Association
Nisutuk
Igiugig Electric Company
Tonnong
Ruby, City of
Goodnews Bay
Savonoski
Katlukt
Pebble Bay Village Council
Eek
Metlakatla
Red Devil
Nulato
Nulato
Nutkay
Katik Electric Services
Ipiquik Electric Company (Ipiquik)
Crebsburg
St. Michael
Gwichyaa Zhee Utilities (Fort Yukon)
Domingo Joint Utilities
Cleaves Electric
Mixing Light & Power
Quilalik
Hooper Bay
Tulitak Traditional Power Utility
Atakanuk
Holy Cross
Golovin Power Utilities
Alaska Power Utilities
HNN Electric Cooperative
Riverbank, Inc.
Ekuk
Noyok
Beales
Kake, City of
Tuska Power Company
Teller Power Company
Mashinli
Shishmaref
Nerka
Ambler

Thousands
0.00 2.00 4.00 6.00 8.00

(pce rep2.wpd) November 16, 1998 6.16
FIGURE 6.5 (part 2)

RESIDENTIAL CONSUMPTION PER CUSTOMER WITH PCE AND AFTER ELIMINATION OF PCE (PART 2)

FIGURE 6.6 (part 1)

RESIDENTIAL BILL WITH PCE
AND AFTER ELIMINATION OF PCE (PART 1)

$0 $500 $1,000 $1,500 $2,000

G&K, Inc. (Cold Bay)
St. Paul Municipal Electric Utility
Talkeetna Electric Utility
Kotzebue Electric Association
Angoon
Shaktoolik
Port Heiden, City of
Mountain Village
Kake
Yakutat Power
Wine Mountain Utilities
Nelson Lagoon Electric Cooperative, Inc.
Shungnak
Kwig Power Company (Kwig); Tlingit
Andrezina Electric Corporation (Alaska)
Atmautluk Joint Utilities
Tutshiurik Community Service Area.
Hoonah
Egegik Light & Power Co.
Atlat Light & Power Company, Inc.
Unalaska Valley Electric Cooperative
Kunuk
Nasenag Light Plant (Chehalis)
St. George Municipal Electric Utility
Teller Power Company
Kiana
Perryville, City of
New Sitkalidak
Talgek
Napaskiak Electric Utility
Nome Joint Utility System
Tinsley Bay Public Utility
Anchorage
Wales
Nulato Electric Association, Inc.
Pilot Station
Summit Bay
Enmonak
Kasilox
Pilot Point Village Council
Ungusaka Power Company (Kwethluk)
McGirt Light & Power
Nushagak Electric Cooperative, Inc. (Dillingham)
Pedro Bay Village Council
Levelock Electric Cooperative
Minta
Shungnak
False Pass Electric Association
Pehri Hope
Tolukuk Bay
Kasolin
Gambell
Red Deal
Ruby, City of
Akaak Power Utilities
Agmack, City of
I-H-N Electric Cooperative
Tanalian Electric Cooperative, Inc.
Kuskok Light & Power
Galena, City of
Igiugig Electric Company
Haines
Telt (includes Dhi Line)
Igiugig
Tanana Power Company
Kvichak, Inc.
Chistochina
Bottles
FIGURE 6.6 (part 2)

RESIDENTIAL BILL WITH PCE AND AFTER ELIMINATION OF PCE (PART 2)

Power Cost Equalization

Economic Significance
# FIGURE 6.7 (part 1)

**UTILITY DEFICIT WITH ELIMINATION OF PCE (PART 1)**

<table>
<thead>
<tr>
<th>Thousands (S100)</th>
<th>($50)</th>
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</thead>
</table>

- Gustavus Electric Company
- Eagle Power Company
- Shageluk
- Old Harbor
- Healy Lake
- Unalaska Power Company (Unalaska)
- Chuitna Electric
- Nome Joint Utility System
- Chignik Electric
- Scammon Bay
- Quinhagak
- Point Lay
- Nome
- Nulato
- New Snakehead
- Holy Cross
- White Mountain Utilities
- Ruedunik, Inc.
- Pilot Station
- Russian Mission
- St. Michael
- Port Libertine
- Chevak
- Shungnak
- Grayling
- Golovin Power Utilities
- Wales
- Hooper Bay
- Ermont
- Galena, City of
- Crooked Creek
- Manokotak Power Company
- Tok (includes Dol Lake)
- Hooper Bay
- Goodnews Bay
- Hughes Power & Light
- Bells
- Koyuk
- Yakutat Power
- Kake
- Kaltag
- Kwig Power Company (Westering)
- Brevig Mission
- Elim
- Sheldon Point, City of
- Nelson Lagoon Electric Cooperative, Inc.
- St. Paul Municipal Electric Utility
- Athakash Energy Systems (Alaska)
- Perryville, City of
- Atlin Light & Power Company, Inc.
- Sand Point Electric Company
- Tensleep Springs
- Mono
- Pilot Point Village Council
- Chistochina
- Akiak Native Community Electric Co.
- Manley Utility Company
- Naknek Electric Association, Inc.
- Waltumght
- Atkati
- Taku Traditional Power Utility
- Nutaaq
- Anaktuvuk Pass
- St. George Municipal Electric Utility
- Point Hope
- China Electric Inc.
- False Pass Electric Association
- Unalaska Joint Utilities

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*November 16, 1998*
FIGURE 6.7 (part 2)

UTILITY DEFICIT WITH ELIMINATION OF PCE (PART 2)

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(filerep2.wpd) November 16, 1998 6.21
FIGURE 6.8 (part 1)

LOSS OF PURCHASING POWER WITH ELIMINATION OF PCE (PART 1)

Thousands

$0  $100  $200  $300  $400

Kakechuck Electric Association
Nushagak Electric Cooperative, Inc. (Dillingham)
Nome Joint Utility System
Nooka
Nokolal
Takl (includes Dot Lake)
Naknek Electric Association, Inc.
Sand Point Electric Company
I-N-N Electric Cooperative
Mountview Village
Eskaham
Angoon
Teige
Alexsit Light & Power Company, Inc.
McGrath Light & Power
Freepay
Nordvik
Sinugak
Tukon
Unalakleet Valley Electric Cooperative
Hanna
Satvik
Camgabel
Pilot Station
Yakutat Power
Gwiyipaa Zhee Utilities (Frem Yoken)
Quinagah
New Skagamak
Teekoxak Bay
Saxman Bay
Amber
Alaskan Native Community Electric Co.
Guadalupe Electric Company
Alakanuk
Kapux Light Plant
Savonoga
St. Paul Municipal Electric Utility
Hwy2 Power Company (Kwikillingak)
Jiti
Niitok
Chevak
Kwethiuk, Inc.
Shekmb
Ahiok
Gaiana, City of
Shungnak
Italy Goux
Nisitna
Shaktoolik
Einn
Teller Power Company
Nordik Electric Services
Resirk
Tunululuk Community Service Assn.
Ryok
Nisitna
St. Michael
Napakisak Electric Utility
Hydaburg
Old Harbor
Northway Power & Light
Molongyk
Tunukak
Manokotak Power Company
Tanana Power Company
Chilkat Valley
Point Hope
Almanzak Joint Utilities
Goodnews Bay

- RESIDENTIAL  - COMMERCIAL  - COMMUNITY  - GOVERNMENT  - OTHER

(pecrep2.wpd) November 16, 1998 6.22
FIGURE 6.8 (part 2)

LOSS OF PURCHASING POWER WITH ELIMINATION OF PCE (PART 2)

Thousands

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- RESIDENTIAL
- COMMERCIAL
- COMMUNITY
- GOVERNMENT
- OTHER

(ucerp2.wpd) November 16, 1998 6.23
FIGURE 6.9 (part 1)

SHARE OF HH INCOME DEVOTED TO ELECTRICITY AFTER ELIMINATION OF PCE (PART 1)

INCLUDES RESIDENTIAL AND COMMUNITY FACILITY ELECTRICITY USE

November 16, 1998
FIGURE 6.9 (part 2)

SHARE OF HH INCOME DEVOTED TO ELECTRICITY AFTER ELIMINATION OF PCE (PART 2)

INCLUDES RESIDENTIAL AND COMMUNITY FACILITY ELECTRICITY USE

Andreanof Electric Corporation (Atka)
Chiniotina
Old Harbor
Esk
Nassak
Napaskitak Electric Utility
Nousaufl
Aniak Light & Power Company, Inc.
Point (Atka)
Napaskiak Electric Company (Elektro)
Sel Leafs
Stilling
Skilak
Arivat
Aniak
Tulasiak Traditional Power Utility
Manokotak Power Company
McGrath Light & Power
Unalakleet Valley Electric Cooperative
Huslia
Huslia
I-H-N Electric Cooperative
Crooked Creek
Hyder
Yukon Power
Kotzebue Electric Association
Akikakak Native Community Electric Co.
Terlissac Springs
Churchill
Fort Heiden, City of
Trotta Bay Public Utility
Gwachyaa Zees Utilities (Fort Yukon)
Galena, City of
Polar Village Council
Nelson Lagoon Electric Cooperative, Inc.
Kodiak Electric Services
Elfin Cove Electric Utility
Tal (includes Dil Lake)
Nekwik Electric Association, Inc.
Pennyville, City of
Beaver Joint Utilities
Atka, City of
Shelba Point, City of
Sand Point Electric Company
Nama Joint Utility System
Battles
Bagest
Telin
Kosim
Walwright
Northeast Power & Light
Kodiak
Manley Valley Company
Chugash Electric
Aniakshak Pass
Point Hope
Shagluk
Nushagak Electric Cooperative, Inc. (Dillingham)
Far North Utilities (Central)
Naseat
Eagle Power Company
Tanalian Electric Cooperative, Inc.
Clikikt Valley
Gustavus Electric Company
Healy Lake
Point Lay

INCLUDES RESIDENTIAL AND COMMUNITY FACILITY ELECTRICITY USE
FIGURE 6.10 (part 1)

UTILITY DEFICIT WITH ELIMINATION OF PCE (PART 1)
PRICE ELASTICITY - .3

Thousands
($100)  ($50)  $0

Gustavus Electric Company
I-N-N Electric Cooperative
Hoonvil
Emmonak
Eagle Power Company
Solvik
Nulato
Old Harbor
Shishmaref
Kiana
Toksook Bay
Guntimek
Hoy Cross
Chevak
Kutzbach
Amalik
Elm
Toguk
Kuskokwim
Shagatlik
Mount St. Elmo
Kailag
Pilot Station
Graig
Tunumak
Marley Utility Company
Unquiraq Power Company (Hoonvil)
Savoonga
Goodnews Bay
Koyuk
New Stuyahok
Kotlik
Saxman Bay
St. Michael
Clawed Creek
Kataska
Hope Bay
Chuathbaluk
Kotlik Electric Services
Brieg Mission
Mountain Village
Wales
Sebbins
Kwik Power Company (Kawgigan)
Ignatkiug Electric Company (Beeling)
Alaska Electric Systems (Kotlik)
Beaver Joint Utilities
Anvik
Aleutak Native Community Electric Co.
Angoon
Far North Utilities (Central)
Diomede Joint Utilities
Tenneha Springs
Healy Lake
Talkeetna
Russian Mission
Ak Alakvik
Kipuk Light Plant
Chitina
Kasaan
Seward
Mekoryuk
Hopkins
Stony River
Nukluk Electric Association, Inc.
Nelson Lagoon Electric Cooperative, Inc.
### FIGURE 6.10 (part 2)

#### UTILITY DEFICIT WITH ELIMINATION OF PCE (PART 2)

| Price Elasticity: -0.3 |

<table>
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<tr>
<th>$100k</th>
<th>$50k</th>
<th>$0</th>
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<table>
<thead>
<tr>
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<tr>
<td>Yukon Power</td>
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<tr>
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<tr>
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<tr>
<td>Stevens Village Energy Systems</td>
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</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>Bethel, Inc.</td>
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<tr>
<td>Igiugig Electric Company</td>
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<tr>
<td>Takotna Community Association</td>
<td></td>
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<tr>
<td>Galena, City of</td>
<td></td>
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<tr>
<td>Point Hope</td>
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<td>Nushagak Light Plant (Chenega)</td>
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<td>Port Hedley, City of</td>
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<td>Teller Power Company</td>
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<tr>
<td>Hughes Power &amp; Light</td>
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</tr>
<tr>
<td>Red Devil</td>
<td></td>
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<td>Gambell</td>
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<tr>
<td>Chilkat Valley</td>
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<tr>
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<td>Tuttulatuk Community Service Association</td>
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<td>Hydaburg</td>
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<td>St. Paul Municipal Electric Utility</td>
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<tr>
<td>McGarv Light &amp; Power</td>
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<td>Nushagak Electric Cooperative, Inc. (Bethel)</td>
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</tbody>
</table>

November 16, 1998

6.27
FIGURE 6.11 (part 1)

UTILITY % DEFICIT WITH ELIMINATION OF PCE (PART 1)
PRICE ELASTICITY - .3

PERCENT OF NON-FUEL EXPENSES

[Diagram showing the percentage of non-fuel expenses for various utilities with a price elasticity of -0.3.]
FIGURE 6.11 (part 2)

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| PRICE ELASTICITY -.3 |

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<th>PERCENT OF NON-FUEL EXPENSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hoonah</th>
<th>Atlik, City of</th>
<th>Rulissi</th>
<th>Iglingiig Electric Company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Point Lay</td>
<td></td>
<td>Stevens Village Energy Systems</td>
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<tr>
<td></td>
<td>Rulkok</td>
<td></td>
<td>Talkeena Community Association</td>
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<td></td>
<td>Elfin Cove Electric Utility</td>
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<td>Allak Power Utilities</td>
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<td>Andreanof Electric Corporation (Alka)</td>
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<td>Manokotak Power Company</td>
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<td>Niskew Electric Association, Inc.</td>
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<td>Nelsan Light Plant (Chitina)</td>
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<td>Kwikash, Inc.</td>
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<td>Northway Power &amp; Light</td>
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<td>Amalik &amp; Joint Utilities</td>
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<td>Sheldore Point, City of</td>
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<td>Egegik Light &amp; Power Co.</td>
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<td>Talke</td>
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<td>St. George Municipal Electric Utility</td>
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<td>Port Hehden, City of</td>
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<td></td>
<td>Chinlon Electric Inc.</td>
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<td>Tela (includes Dolly Lake)</td>
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<td>Nome Joint Utility System</td>
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<td>McGrath Light &amp; Power</td>
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<td>Houtabog</td>
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<td>Hughes Power &amp; Light</td>
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<td>Perryville, City of</td>
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<td>Chillit Valley</td>
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<td></td>
<td>Tanafon Electric Cooperative, Inc.</td>
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<td>Gohnni Power Utilities</td>
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</table>

(pcered2.wpd)  November 16, 1998  6.29
## FIGURE 6.12 (part 1)

### PCE IMPACT (PART 1.)

**ALL PCE UTILITIES (HIGH CUSTOMER RESPONSE)**

<table>
<thead>
<tr>
<th>WITH PCE</th>
<th>WITHOUT PCE</th>
<th>CHANGE AMOUNT</th>
<th>%</th>
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<tbody>
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<td>227,245,200</td>
<td>188,207,252</td>
<td>39,037,957</td>
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<tr>
<td>79,417,373</td>
<td>54,694,494</td>
<td>24,722,879</td>
<td>-31.1%</td>
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<tr>
<td>65,833,605</td>
<td>59,461,286</td>
<td>6,372,329</td>
<td>-10.5%</td>
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<tr>
<td>18,185,622</td>
<td>10,504,852</td>
<td>7,680,770</td>
<td>-42.2%</td>
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<tr>
<td>28,548,517</td>
<td>28,016,619</td>
<td>531,908</td>
<td>-1.9%</td>
</tr>
<tr>
<td>5,200,092</td>
<td>5,244,920</td>
<td>44,828</td>
<td>-0.9%</td>
</tr>
</tbody>
</table>

**SALES (KWH)**

- Residential: $54,000,000 (+2.5%)
- Commercial: $24,000,000 (+2.3%)
- Community Facility: $10,000,000 (+1.7%)
- Government: $15,000,000 (+2.0%)
- Other: $6,000,000 (+1.5%)

**EXPENSES (S)**

- Residential: $52,000,000 (+2.2%)
- Commercial: $15,000,000 (+2.5%)
- Community Facility: $9,000,000 (+2.0%)
- Government: $9,000,000 (+2.1%)
- Other: $1,000,000 (+2.5%)

**REVENUES ($)**

- Residential: $52,000,000 (+2.2%)
- Commercial: $15,000,000 (+2.5%)
- Community Facility: $9,000,000 (+2.0%)
- Government: $9,000,000 (+2.1%)
- Other: $1,000,000 (+2.5%)

**PCE IMPACT (PART 1.)**

- Household Impact: 2.5%
- Residential Impact: 3.1%
- Commercial Impact: 2.3%
- Community Facility Impact: 2.2%
- Government Impact: 2.1%
- Other Impact: 2.5%

**AVG PRICE / KWH**

<table>
<thead>
<tr>
<th>AVG PRICE / KWH</th>
<th>Elasticity</th>
<th>PCE / REVENUES Dependency Ratio</th>
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<tbody>
<tr>
<td>Residential</td>
<td>0.14</td>
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<tr>
<td>Commercial</td>
<td>0.06</td>
<td>23.3%</td>
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<tr>
<td>Community Facility</td>
<td>0.03</td>
<td>10.3%</td>
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<tr>
<td>Government</td>
<td>0.03</td>
<td>10.4%</td>
</tr>
<tr>
<td>Other</td>
<td>0.10</td>
<td>5.1%</td>
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**HOUSEHOLD DATA**

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<tr>
<td>1,965</td>
<td>44,120</td>
<td>$1,167</td>
<td>$211</td>
<td>3.1%</td>
<td>3.2%</td>
<td>1,065</td>
<td>283</td>
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<tr>
<td>1,965</td>
<td>44,120</td>
<td>$1,167</td>
<td>$211</td>
<td>3.1%</td>
<td>3.2%</td>
<td>1,065</td>
<td>283</td>
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<tr>
<td>1,965</td>
<td>44,120</td>
<td>$1,167</td>
<td>$211</td>
<td>3.1%</td>
<td>3.2%</td>
<td>1,065</td>
<td>283</td>
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<tr>
<td>1,965</td>
<td>44,120</td>
<td>$1,167</td>
<td>$211</td>
<td>3.1%</td>
<td>3.2%</td>
<td>1,065</td>
<td>283</td>
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</table>
FIGURE 6.12 (part 2)

PCE IMPACT (PART 2.) : COMMUNITY IMPACT

ALL PCE UTILITIES (HIGH CUSTOMER RESPONSE)

<table>
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<th>Households</th>
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<td>Total Household Income</td>
<td>$562,100,603</td>
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Direct Financial Burden from PCE Loss if All Borne by Community:

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Residential</td>
<td>$3,400,050</td>
</tr>
<tr>
<td>Commercial</td>
<td>$3,991,812</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$303,320</td>
</tr>
<tr>
<td>Government</td>
<td>$753,236</td>
</tr>
<tr>
<td>Other</td>
<td>$46,627</td>
</tr>
<tr>
<td>Balance</td>
<td>$2,439,577</td>
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</table>

Direct Financial Burden from PCE Loss if Some shifted outside Community:

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<th>Category</th>
<th>Local Burden Share</th>
<th>Amount</th>
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<td>Residential</td>
<td>100%</td>
<td>$3,400,050</td>
</tr>
<tr>
<td>Commercial</td>
<td>33%</td>
<td>$1,254,601</td>
</tr>
<tr>
<td>Community Facility</td>
<td>100%</td>
<td>$303,320</td>
</tr>
<tr>
<td>Government</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td>Other</td>
<td>100%</td>
<td>$46,627</td>
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Local Burden $5,203,939

Percent Decline from PCE Loss: 0.9%

Percent Decline in Household Income from PCE Loss:

<table>
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<th>Category</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Commercial</td>
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<tr>
<td>Government</td>
<td>$753,236</td>
</tr>
<tr>
<td>Other</td>
<td>$0</td>
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</table>

Date: November 16, 1998
## FIGURE 6.13 (part 1)

### PCE IMPACT (PART 1.)

**ALL BUT 5 LARGEST PCE UTILITIES (HIGH CUSTOMER RESPONSE)**

<table>
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<th>WITHOUT PCE</th>
<th>CHANGE</th>
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</thead>
<tbody>
<tr>
<td>SALES (KWH)</td>
<td>$103,449,676</td>
<td>$33,972,622</td>
</tr>
<tr>
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<td>29,902,000</td>
<td>21,482,922</td>
</tr>
<tr>
<td>Commercial</td>
<td>47,491,716</td>
<td>5,429,973</td>
</tr>
<tr>
<td>Community Facility</td>
<td>6,119,677</td>
<td>6,853,069</td>
</tr>
<tr>
<td>Government</td>
<td>14,691,064</td>
<td>150,493</td>
</tr>
<tr>
<td>Other</td>
<td>5,244,920</td>
<td>16,172</td>
</tr>
<tr>
<td>EXPENSES ($)</td>
<td>$44,181,886</td>
<td>($3,525,419)</td>
</tr>
<tr>
<td>Fuel</td>
<td>$10,641,152</td>
<td>($3,525,419)</td>
</tr>
<tr>
<td>Non-Fuel</td>
<td>$28,114,847</td>
<td>$0</td>
</tr>
<tr>
<td>Other</td>
<td>$5,429,887</td>
<td>$5,429,887</td>
</tr>
<tr>
<td>Cost/Kwh</td>
<td>$0.43</td>
<td>$0.08</td>
</tr>
<tr>
<td>REVENUES ($)</td>
<td>$41,742,551</td>
<td>($5,964,751)</td>
</tr>
<tr>
<td>Residential</td>
<td>$12,400,631</td>
<td>$2,423,614</td>
</tr>
<tr>
<td>Commercial</td>
<td>$19,867,890</td>
<td>$3,366,692</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$2,592,584</td>
<td>$799,630</td>
</tr>
<tr>
<td>Government</td>
<td>$5,045,874</td>
<td>$648,700</td>
</tr>
<tr>
<td>Other</td>
<td>$1,015,575</td>
<td>$46,057</td>
</tr>
<tr>
<td>PCE</td>
<td>$0</td>
<td>($10,380,142)</td>
</tr>
<tr>
<td>BALANCE</td>
<td>($2,433,332)</td>
<td>($2,433,332)</td>
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### HOUSEHOLD DATA

<table>
<thead>
<tr>
<th>HH</th>
<th>Household Impact</th>
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<tr>
<td>9.912</td>
<td>9.912</td>
</tr>
<tr>
<td>$40,271</td>
<td>$40,271</td>
</tr>
<tr>
<td>$1,213</td>
<td>$1,213</td>
</tr>
<tr>
<td>$595</td>
<td>$595</td>
</tr>
<tr>
<td>Electric Bill / Res Cust</td>
<td>$1,056</td>
</tr>
<tr>
<td>Electric Cost / Res Cust</td>
<td>$1,359</td>
</tr>
<tr>
<td>2.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Electric Bill Share of Income</td>
<td>2.6%</td>
</tr>
<tr>
<td>2.6%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Electric Cost Share of Income</td>
<td>0.6%</td>
</tr>
<tr>
<td>4,378</td>
<td>4,378</td>
</tr>
<tr>
<td>Annual Use Per Res Cust</td>
<td>2,547</td>
</tr>
<tr>
<td>365</td>
<td>365</td>
</tr>
<tr>
<td>Monthly Use Per Res Cust</td>
<td>212</td>
</tr>
</tbody>
</table>
### PCE Impact (Part 2): Community Impact

#### All But 5 Largest PCE Utilities (High Customer Response)

<table>
<thead>
<tr>
<th>Category</th>
<th>Income</th>
<th>Financial Burden</th>
<th>Share</th>
<th>Local Burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$4,891,964</td>
<td>$2,423,644</td>
<td>100%</td>
<td>$2,423,644</td>
</tr>
<tr>
<td>Commercial</td>
<td>$3,366,952</td>
<td>$1,111,008</td>
<td>33%</td>
<td>$599,030</td>
</tr>
<tr>
<td>Community Facility</td>
<td>$250,030</td>
<td>$250,030</td>
<td>100%</td>
<td>$250,030</td>
</tr>
<tr>
<td>Government</td>
<td>$246,700</td>
<td>$246,700</td>
<td>0%</td>
<td>$246,700</td>
</tr>
<tr>
<td>Other</td>
<td>$646,700</td>
<td>$646,700</td>
<td>0%</td>
<td>$646,700</td>
</tr>
<tr>
<td>Balance</td>
<td>$2,439,332</td>
<td>$2,439,332</td>
<td>100%</td>
<td>$2,439,332</td>
</tr>
</tbody>
</table>

#### Percent Decline from PCE Loss

- 1.0% for Household Income from PCE Loss

#### Percent Decline in Household Income from PCE Loss

- Commercial: $2,255,683
- Government: $546,760
- Other: $0
7. ELIMINATION OF THE POWER COST EQUALIZATION PROGRAM--THE ECONOMIC SIGNIFICANCE

OVERALL SIGNIFICANCE

For fiscal year 1996 the Power Cost Equalization Program (PCE) disbursed $19.202 million to utilities serving 190 communities in Alaska. We estimate that if that disbursement were eliminated there would be a loss of 210 full time equivalent jobs in the state with an associated loss of payroll of $4.908 million (Figure 7.1). A large share of the job loss would occur in urban Alaska. These estimates include the multiplier effect of the reduction in purchasing power of users whose electricity rates increased.

The loss of revenues to the utilities from the elimination of PCE would be recovered in two ways. A portion, estimated at $2.791 million, would be made up through a reduction in utility costs for the purchase and use of fuel oil. Since higher rates would reduce sales, less fuel oil would be required.

Most of the loss in revenues would need to be recovered from electricity users through higher rates. The majority, $11.446 million, would come from higher rates paid directly and indirectly by the households in the PCE communities. The largest portion is the $8.893 million paid directly through higher residential bills. Households would also bear the burden of the $2.252 million in additional electricity bills paid by community facilities. That is because these facilities must turn to community residents to pay their bills and they will pass on their higher costs in higher charges for services and higher taxes. We also assume that households will pay the deficit faced by those utilities that cannot cover their costs through higher rates, a total of $2.727 million, as well as a small additional bill of $.029 million for the “other” category of user.

The remainder of the loss in revenues would become a financial burden for the other users of electricity. The state and federal governments would share a burden of $.580 million in additional expenses for electricity. Commercial users, including the public schools, would be responsible for $4.385 million of additional costs. Most of this portion of the lost PCE revenues would not be recovered from local residents, but rather from state and federal government budgets and from businesses that would pass on their higher costs outside the PCE communities. However, some of the higher cost of doing business would be passed on to households in the PCE communities through lower wage rates, lower tax payments, lower rents, and higher prices for goods sold.

We estimate that the reduction in fuel oil purchases results in the loss of 28 full time equivalent jobs and $.963 million in wages. These jobs are distributed among water transportation, wholesaling, petroleum refining, crude production, trade, and services.

We estimate that the loss of $11.446 million of purchasing power in PCE communities
Power Cost Equalization Economic Significance

results in a loss of 127 full time equivalent jobs and $2.752 million of wages. Each additional dollar spent on electricity is one less dollar spent for other purchases. The jobs lost from the reduction in these purchases are in transportation, trade and services.

We estimate that the increase in state and federal expenditures on electricity as well as the increase of business expenditures on electricity results in a loss of 55 full time equivalent jobs and a payroll of $1.193 million. Governments recover the higher costs of electricity through an increase in taxes on households, or a reduction in the wages paid to government workers, the largest category of government operating cost. Private businesses pass the burden of higher electricity costs onto workers in the form of lower paychecks. In both cases the purchasing power of Alaska residents is reduced by the amount of the higher electricity bills.

Sixty percent of the burden of higher electricity bills will be paid directly by the residents of the effected PCE communities. Twenty six percent will be paid by residents of the state, with the exact distribution uncertain. The remaining fourteen percent will be absorbed by reduced fuel oil purchases made possible by reduced electricity sales.

URBAN CONCENTRATION OF JOB AND WAGE LOSS

Based on the distribution of the burden we estimate that a large share of the economic impact, probably more than half the loss in jobs and wages, would occur in urban Alaska. Although the largest share of the loss in purchasing power will occur in the PCE communities in rural Alaska, these small rural communities have very little economic infrastructure. Of the $8.893 million of purchasing power directly lost by households through higher electricity bills, about half would occur in 100 small communities with populations of less than 500 (Figure 7.2). In these small places there are few businesses and most shopping is done outside the community.

Few studies have estimated the leakage of purchasing power from small places, but a detailed household expenditure survey done in Kake, a community of 700 (1990) confirms the idea that most purchasing power goes for purchases outside the local economy. That survey showed that less than one third of total household expenditures made by community residents took place in Kake and more than two thirds of purchases were made outside (Figure 7.3). Another piece of evidence of the small multiplier in rural Alaska is the low ratio of trade employment to total population in the less populous census areas of Alaska. For example Anchorage has 116 trade jobs for every 1000 population while in the Lake and Peninsula Borough there are only 16 (Figure 7.4).

Some of the leakage goes to the regional centers, particularly Barrow, Nome, Kotzebue, Bethel, and Dillingham. However a large share makes its way to Anchorage and Fairbanks and to a lesser extent to the larger communities in Southeast Alaska.

INCREASE IN DIRECT COSTS TO STATE GOVERNMENT
Elimination of the PCE program would impose several types of costs on state government. These costs would partially or totally offset the savings that would result from program termination. These costs include direct out of pocket costs from higher electricity rates, additional costs for self generation of some state funded facilities, costs associated with reduced reliability of electricity, and additional health and social costs due to reduced availability of electricity in rural communities. The direct costs are the easiest to quantify.

Because state facilities in PCE communities would be impacted by higher rates, the elimination of PCE would directly increase state expenditures for electricity. State government facility electricity use is not eligible for PCE, but these facilities do enjoy rates that reflect the spreading of the cost of generation among a larger number of kwh than would be the case without PCE. In the last Section we estimated that the total expenditures by government on electricity would increase by about 6 percent if PCE were eliminated. We estimate that half of these additional expenditures, $290 million, would be made by state government agencies.

The public schools, which are considered commercial users for the purposes of PCE eligibility, would also find themselves facing higher rates and bills. Their bills would increase not only as a result of the increase in the average cost of electricity generation, but also because each school facility would lose the current PCE assistance available on the first 700 kwh per month of use (Figure 7.5). We estimated that total expenditures for electricity by commercial users would increase 13 percent with the termination of PCE.

Based on reported expenditures on electricity by schools in PCE communities\(^\text{12}\) we estimate that the additional financial burden on PCE community schools from termination of the PCE would be $1.406 million, an increase of 13 percent in the electricity bill of the schools. Assuming this is paid out of the state education budget, the total increase in state expenses for electricity with the termination of the PCE program would be $1.695 million (Figure 7.1).

**INCREASE IN INDIRECT COSTS TO STATE GOVERNMENT**

The indirect burden on state government from the elimination of PCE is more difficult to estimate but it could be considerable. There are at least three components of this indirect burden.

The first is the additional cost associated with providing electric power to state facilities through self generation in those cases where the local utility goes out of business. Were a PCE utility to cease operation because it could not cover its costs, the cost of alternative self generation for a state facility continuing to operate would be greater than that of the utility.

The second cost would be the reduction in the reliability of electric power due to the erosion of the financial strength of the PCE utilities. Utilities trying to cover deficits will reduce...
maintenance and this will lead to an increase in power outages and the need for additional standby capacity among users for whom such outages are costly. Reliability would also be compromised where a PCE utility shut down and thus eliminated one source of electricity generation within a community for users such as schools and hospitals.

A third type of cost to the state would be associated with increases in the incidence of health and social related problems attendant a reduction in the availability and use of electricity in small rural communities. We have not quantified what the size of these costs might be, but we discuss some of the special benefits of electricity for rural Alaska in the final section of this report.
### POWER COST EQUALIZATION PROGRAM

#### ECONOMIC SIGNIFICANCE

(FY 1996)

<table>
<thead>
<tr>
<th></th>
<th>CHANGE TO OFFSET LOSS</th>
<th>LOST WAGES</th>
<th>LOST JOBS</th>
</tr>
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<tbody>
<tr>
<td>TOTAL PCE PAYMENT IN 1996</td>
<td>$19,201,515</td>
<td>$4,908,035</td>
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</tr>
<tr>
<td>Reduction in Fuel Oil Purchases</td>
<td>$2,791,498</td>
<td>$963,067</td>
<td>28</td>
</tr>
<tr>
<td>Added Financial Burden on</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households in PCE Communities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Bills</td>
<td>$8,892,030</td>
<td>$2,137,836</td>
<td>99</td>
</tr>
<tr>
<td>Community Facility Bills</td>
<td>$2,251,241</td>
<td>$541,198</td>
<td>25</td>
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<tr>
<td>Other Bills</td>
<td>$29,111</td>
<td>$6,998</td>
<td>0</td>
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<tr>
<td>Balance to Offset Utility Deficits</td>
<td>$272,389</td>
<td>$65,482</td>
<td>3</td>
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<tr>
<td>Added Financial Burden on</td>
<td>$4,964,447</td>
<td>$1,193,453</td>
<td>55</td>
</tr>
<tr>
<td>Government and Private Business</td>
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<td></td>
<td></td>
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<tr>
<td>State and Federal Government</td>
<td>$579,593</td>
<td>$139,334</td>
<td>6</td>
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<tr>
<td>Commercial (Includes Schools)</td>
<td>$4,384,854</td>
<td>$1,054,119</td>
<td>49</td>
</tr>
<tr>
<td>Note: Added Direct Financial Burden on State Budget to Offset PCE Loss</td>
<td>$1,695,447</td>
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<td></td>
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<tr>
<td>Government Facilities</td>
<td>$289,796</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial (Includes Schools)</td>
<td>$1,405,651</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lost Jobs and Wages include the multiplier effect of the loss of purchasing power associated with program elimination.
FIGURE 7.2

LOST PURCHASING POWER
CONCENTRATED IN SMALL PLACES

CUMULATIVE PURCHASING POWER
Millions

$8.00

$6.00

$4.00

$2.00

$0.00

PLACES ARRANGED FROM SMALLEST TO LARGEST

60  96  111  146  189  233  279  316  406  601  725  996

NUMBERS ABOVE BARS INDICATE POPULATION OF PLACE
### KAKE HOUSEHOLD EXPENDITURES BY LOCATION

**SURVEY RESULTS**

<table>
<thead>
<tr>
<th>WHERE $ SPENT</th>
<th>$</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>KAKE</td>
<td>$381,342</td>
<td>31.9%</td>
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<tr>
<td>OTHER SE AK</td>
<td>$394,814</td>
<td>33.0%</td>
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<tr>
<td>ELSEWHERE</td>
<td>$420,296</td>
<td>35.1%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$1,196,452</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

**SOURCE:** KAKE ECONOMIC DEVELOPMENT PROJECT, DAVID MARSHALL AND ASSOC., 1990.
## FIGURE 7.4

### TRADE EMPLOYMENT AND POPULATION FOR ALASKA CENSUS AREAS

<table>
<thead>
<tr>
<th>CENSUS AREA</th>
<th>WHOLESALE TRADE</th>
<th>RETAIL TRADE</th>
<th>TOTAL TRADE</th>
<th>POPULATION</th>
<th>TRADE JOB PER 1000 POP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANCHORAGE</td>
<td>8,796</td>
<td>45,802</td>
<td>54,598</td>
<td>611,300</td>
<td>89.3</td>
</tr>
<tr>
<td>FAIRBANKS</td>
<td>5,188</td>
<td>23,251</td>
<td>29,449</td>
<td>254,849</td>
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<td>MATSU</td>
<td>753</td>
<td>6,056</td>
<td>6,809</td>
<td>82,278</td>
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<td>DENALI</td>
<td>257</td>
<td>2,437</td>
<td>2,694</td>
<td>52,448</td>
<td>51.4</td>
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<td>BRISTOL BAY BOROU</td>
<td>0</td>
<td>105</td>
<td>105</td>
<td>1,899</td>
<td>55.3</td>
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<td>KETCHIKAN</td>
<td>13</td>
<td>106</td>
<td>119</td>
<td>1,270</td>
<td>93.7</td>
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<td>JUNEAU</td>
<td>209</td>
<td>1,293</td>
<td>1,502</td>
<td>14,599</td>
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<td>SKAGWAY</td>
<td>226</td>
<td>2,715</td>
<td>2,941</td>
<td>29,813</td>
<td>98.6</td>
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<td>SITKA</td>
<td>5</td>
<td>333</td>
<td>338</td>
<td>3,753</td>
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<td>HAINES</td>
<td>36</td>
<td>729</td>
<td>765</td>
<td>8,733</td>
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<td>ALEUTIANS WEST</td>
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<td>196</td>
<td>197</td>
<td>2,421</td>
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<tr>
<td>NORTH SLOPE</td>
<td>45</td>
<td>387</td>
<td>432</td>
<td>5,366</td>
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<td>KENAI</td>
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<td>524</td>
<td>7,263</td>
<td>72.1</td>
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<td>2,991</td>
<td>3,438</td>
<td>48,098</td>
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<td>VALDEZ</td>
<td>68</td>
<td>815</td>
<td>883</td>
<td>13,547</td>
<td>65.2</td>
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<tr>
<td>WRANDEL-PET</td>
<td>93</td>
<td>541</td>
<td>634</td>
<td>10,431</td>
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<td>SOUTHEAST FKBKS</td>
<td>14</td>
<td>421</td>
<td>435</td>
<td>7,189</td>
<td>60.5</td>
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<tr>
<td>PRINCE OF WALES</td>
<td>68</td>
<td>369</td>
<td>387</td>
<td>6,876</td>
<td>56.3</td>
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<td>YAKUTAT</td>
<td>1</td>
<td>39</td>
<td>40</td>
<td>833</td>
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<td>426</td>
<td>431</td>
<td>9,178</td>
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<td>DILLINGHAM</td>
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<td>207</td>
<td>209</td>
<td>4,521</td>
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<td>NORTHWEST</td>
<td>0</td>
<td>243</td>
<td>243</td>
<td>6,701</td>
<td>36.3</td>
</tr>
<tr>
<td>WADE HAMPTON</td>
<td>1</td>
<td>246</td>
<td>247</td>
<td>6,910</td>
<td>35.7</td>
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<tr>
<td>BETHEL</td>
<td>16</td>
<td>541</td>
<td>557</td>
<td>15,597</td>
<td>35.7</td>
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<td>YUKON-KOYUKUK</td>
<td>17</td>
<td>151</td>
<td>168</td>
<td>6,355</td>
<td>26.4</td>
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<tr>
<td>ALEUTIANS EAST</td>
<td>6</td>
<td>46</td>
<td>52</td>
<td>2,238</td>
<td>23.2</td>
</tr>
<tr>
<td>LAKE AND PEN</td>
<td>5</td>
<td>23</td>
<td>28</td>
<td>1,760</td>
<td>15.7</td>
</tr>
<tr>
<td>UNDETERMINED</td>
<td>361</td>
<td>233</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** EMPLOYMENT AND EARNINGS SUMMARY REPORT 1996. ALASKA POPULATION OVERVIEW 1997 ESTIMATES. ALASKA DEPARTMENT OF LABOR
FIGURE 7.5

TYPICAL SCHOOL ELECTRICITY RATE WITH AND WITHOUT PCE

CENTS PER KWH

100 300 500 700 900 1100 1300 1500 1700 1900
MONTHLY KWH USED

WITH PCE

WITHOUT PCE
8. THE VALUE OF ELECTRICITY TO RURAL COMMUNITIES

SPECIAL USES OF ELECTRICITY IN RURAL ALASKA

There are a number of special uses of electricity in rural areas that, while not unique, greatly enhance the quality of life in ways that are often not obvious to urban dwellers. Among these uses are the following:

Streetlights. Streetlights are an important safety feature in communities with long winter nights. For example with streetlights children need not go to and return from school in the dark. Streetlights can also serve as a beacon to guide hunters and other travelers to the safety of the village.

Refrigeration. Refrigerators and freezers provide a safe method of food storage in rural areas where subsistence is an important source of food, and where the supply of groceries is less than certain. The ability to refrigerate and freeze subsistence foods contributes to the general health and well being of the community by reducing the incidence of diseases associated with traditional methods of food storage.

Heat Circulation. Most space heating in rural Alaska is provided by fuel oil. However the distribution of heat is done by electric fans or circulating pumps. Without electricity the efficiency of space heating would be severely and adversely effected.

Supplementary Heat Supply. Electric space heaters and other appliances provide backup space heating capability in the event that the primary heating source breaks down.

Airport Lights. Airport lights expand the hours of operation of airports which are often the only means of transportation access in winter beyond the local community in rural Alaska.

Water Circulation. Water and sewer systems require continuous circulation to prevent freezing which would destroy their pipes and require costly replacement.

Hot Water. The availability of an ample hot water supply for washing and cleaning raises the general level of health in a community.

Interior lighting. Without interior electric lighting much winter activity takes place in semi-darkness. This reduces the productivity of work and may contribute to social problems.

Vehicle Heater Plug-In. Electric plug-in heaters keep vehicles warm enough in the winter to allow them to start in cold weather.

Computers. Access to the outside world via the internet provides information, training,
and the potential for job creation (ex. Marketing locally produced products).

PROTECTING THE PUBLIC AND PRIVATE INVESTMENT IN RURAL ALASKA

The state has a multi-billion dollar investment in infrastructure in rural Alaska that continues to grow each year. This investment is in the form of capital grants, loans, and other forms of assistance to local governments, school districts, and other organizations from both the state and federal governments, as well as expenditures for state owned facilities. Important components of this investment include the rural schools, sewer and water systems, airports, and hospitals and clinics. The commitment to building infrastructure in rural Alaska is underscored by the current program to provide clean water and sewer service to all rural communities in the state over the next few years. The rural electric utilities that have been financed by state grants are another important part of that infrastructure as well as an indicator of commitment.

In addition to public infrastructure there is a large private investment in infrastructure and in the development of the economy of rural Alaska. For example the communications systems that link all communities in the state are an important investment in rural Alaska, enhancing the economic and social well-being of residents and providing opportunities for economic development.

All of this physical infrastructure is dependent on electricity to maintain the facilities, to deliver the educational, sanitation, health, transportation, and communication services that sustain rural communities, and to enhance the economic opportunities in rural Alaska. For example about 5 percent of the budget for the operation of selected rural schools goes to pay for electricity, about 4 percent of the budget for the operation of selected rural airports goes to pay for electricity, and about 18 percent of the budget for the operation of selected national guard armories goes to pay for electricity. Anything that would increase the cost of electricity to these state purchased facilities would jeopardize the quality of their maintenance and their continued operation. In addition any changes that reduced the electricity generating capabilities in the communities that these facilities serve would adversely impact their operations. This includes the closure of electric utilities that forces other public facilities to self generate for their electric power needs.