Copper Valley Electric Association, Inc.

Strategic Issues Discussion Paper

September 2006

P.O. Box 45
Glennallen, AK 99588

September 2006

Dear Member,

Two years ago the price of Alaska North Slope crude oil climbed above $40/barrel and has not slowed since. In August 2006 the average spot price for ANS crude delivered to the West Coast was $71.74, and some say it may be headed even higher. Conflicts in the Middle East, natural disasters and other unpredictable world events contribute to the uncertainty facing world oil markets and have resulted in fluctuating and steadily increasing prices.

CVEA generates more than 40% of its annual electricity requirements from fossil fuel plants, and as a consequence, these high oil prices have also dramatically increased your electric bill.

The CVEA Board of Directors has had an ongoing dialog about the impacts of high oil prices on electric bills since mid-2004. The purpose of this paper is to communicate the substance of what we have learned. The paper is broken into four separate sections:

(1) How CVEA Makes Electricity (this section may be review for many of you)
(2) The Impacts of High Oil Prices and What CVEA Has Been Doing About It
(3) Alternatives to Burning Diesel to Generate Electricity
(4) Other Significant Issues Which Could Affect Power Costs Including the Potential for Generating Electricity with Renewable Technologies

This paper contains a lot of information and identifies some of the contractual and seasonal difficulties of producing power on our system and also identifies some opportunities which we are working to further study and evaluate. It is quite probable the paper leaves many of your questions unanswered. We want to answer those questions. CVEA plans to hold district meetings in the near future to hear your comments, questions and concerns regarding this paper. In the meantime, if you don't want to wait for those meetings, please direct your earlier comments to Clair Heise, Manager of Member & Public Relations, at 822-3211 or 835-7005, or via email to heise@cvea.org.

We hope the paper meets our goal of bringing you up to speed on some of the difficult issues facing CVEA, and we look forward to your feedback on our communication effort.

Sincerely,

James Manning
President, Board of Directors

Robert A. Wilkinson
Chief Executive Officer

Table of Contents

How CVEA Makes Electricity

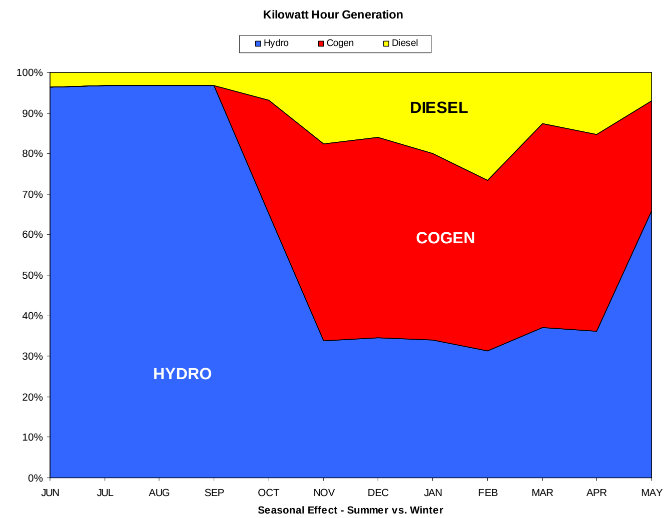
Distribution and Generation Cooperative

Common to rural Alaska electric cooperatives but unlike most of the Nation's 900 electric co-ops, CVEA ***produces*** and distributes electrical energy. CVEA produces electricity at four power plants subject to contractual and seasonal constraints. CVEA's four generating stations include the Solomon Gulch Hydro Project, the CVEA Cogeneration plant, and diesel plants in Glennallen and Valdez. Due to contractual and seasonal limitations, CVEA defines its generating seasons into summer - June through September, and winter - October through May.

Summer/Winter Generating Seasons

Solomon Gulch is capable of providing nearly 100% of CVEA's energy requirements during the summer season; however, the size of the reservoir and water shed limit the amount of energy the hydro project can produce during the winter season. As winter approaches and the lake level drops, CVEA reduces the output of Solomon Gulch and first brings online the cogeneration project, then diesel units from one of the two diesel plants. During the winter months almost 70% of generation requirements are met with the cogen and the diesel plants.

The graph to the right illustrates for a typical year where CVEA produces electricity during the summer and winter seasons.

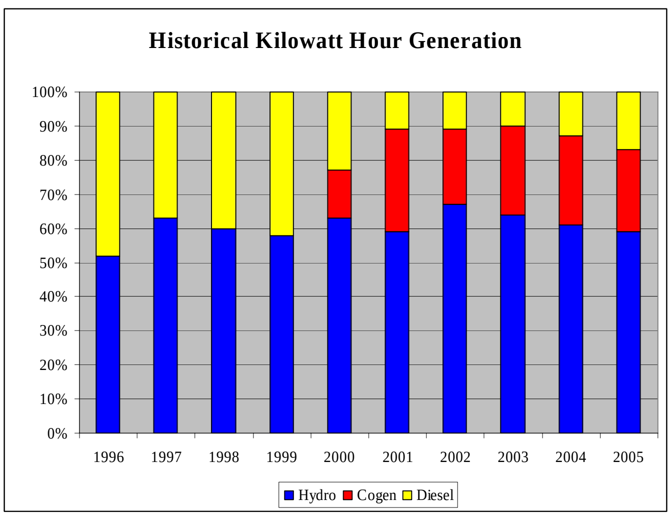


Solomon Gulch Hydroelectric Project

The Solomon Gulch Hydro Project has a 13-megawatt nameplate capacity which is capable of producing approximately 50,000 megawatt-hours of electricity annually. The project is owned by the Four Dam Pool Power Agency (FDPPA), and CVEA has contracted to purchase all the energy the project can produce until October 2030. In 2005 Solomon Gulch produced 58% of CVEA's annual requirement of 84,124 MWHS.

Cogeneration Plant

CVEA constructed the cogeneration project in 1999, and the project began commercial operation in April 2000. The project consists of a stationary, liquid fueled SOLAR Taurus 60 turbine which produces electricity for the CVEA grid and heat (exhaust gas) to Petro Star for use in refining crude oil. The exhaust gas is sold to Petro Star, providing an additional revenue stream to CVEA. The project burns light straight run (LSR) fuel piped directly from the refinery to the turbine fuel skid. CVEA has, subject to equipment availability and the requirement to use all available Solomon Gulch energy, contractually agreed to run the cogeneration project for 5,500 hours per year. To be economical, both for Petro Star and CVEA, the cogeneration project must be run at its full capacity of 5.3 megawatts. During the winter season the project provides approximately 25% of our system's annual energy requirements.



Glennallen and Valdez Diesel Plants

The balance of CVEA's winter system energy requirement is provided by the diesel plants, primarily Glennallen. The reason the Glennallen Plant is run instead of Valdez is because Glennallen has a slightly higher plant fuel efficiency factor, the need to keep the plant warm and immediate availability in the event of a transmission line outage. Over a typical year the diesel plants contribute approximately 15% of CVEA's system energy requirement.

The graph to the left illustrates where CVEA has generated its annual electrical requirement for the last 10 years.

The Impact of High Oil Prices on Electric Bills

How Does CVEA Make Electric Rates and Collect Fuel Costs

CVEA electric rates are based on a detailed Cost of Service Study. The rates we charge today are based on a Cost of Service Study prepared in 1997, which used as its basic assumptions 1996 operations as the test year. The Cost of Service Study allocates costs to customer classes; i.e., residential, small commercial, large commercial. Following this cost allocation procedure, rates are designed to collect the appropriate amount of revenue for each customer class as determined by the Cost of Service Study. A typical rate structure includes the following three components:

- Customer Charge - A flat charge which collects the cost of meter reading, meter depreciation, and the cost of billing and collection activities.
- Energy Charge - This charge varies depending on the number of kilowatt hours the customer uses. The energy charge collects all non-fuel, non-hydro and non-customer related costs; e.g., distribution, operation, and maintenance costs.
- FPPC - Fuel and Purchased Power Cost (see discussion below).

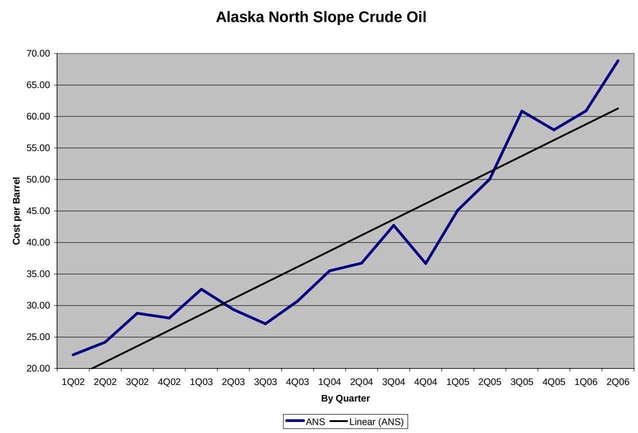
What is FPPC

The fuel and purchased power cost (FPPC) appears as a line item on electric bills and is charged for every kilowatt-hour. The FPPC is a blend of fuel cost and hydro power cost. The FPPC collects both the cost of fuel to generate electrical energy and for the Solomon Gulch hydroelectric power purchased from the Four Dam Pool. Every customer is charged the same FPPC regardless of size, district or customer class.

What Impact has Crude Oil Prices had on the FPPC

Since 2002 Alaska North Slope (ANS) crude has exponentially increased. A similar pattern is seen in our FPPC rate. Fuel burned at the diesel and cogeneration plants is tied to the cost of oil. Oil cost increases drive fuel price increases which in turn drive increases to the FPPC.

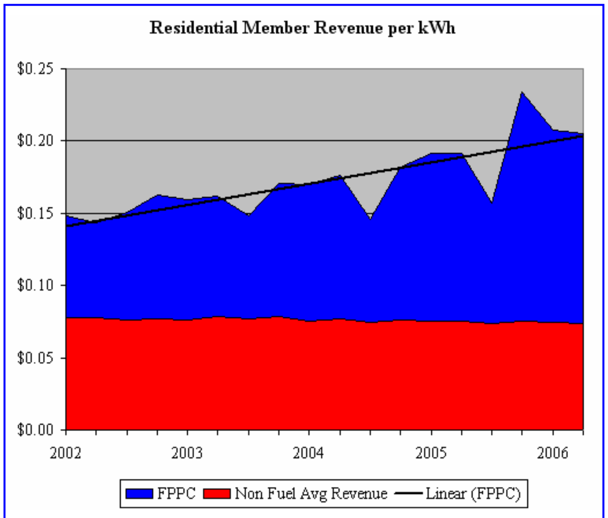
In addition to increases in the market price of crude oil, a proceeding before the Federal Energy Regulatory Commission in 2004 resulted in an order that significantly increased the price Petro Star is charged for the quality bank component of oil purchased from Conoco Phillips. The increased price is passed along to CVEA for LSR fuel it purchases from Petro Star for the cogeneration project.



The above graph illustrates the increasing price of ANS Crude Oil all customers have felt at the gas pump, on the cost of heating oil, on the cost of goods and services, and on the electric bill since 2002.

What has CVEA Done to Help with High Fuel Costs

The FPPC goes up and down as fuel costs change. For the past two years the fluctuations in the FPPC have been very volatile. The FPPC can also fluctuate dramatically depending on the time of year. Up until October 2004 CVEA revised the FPPC quarterly. For the past two years we have put forth a significant effort to address fluctuating prices.



Other than for FPPC increases caused by rising oil prices, CVEA electric bills have not increased since 1998. The above graph illustrates the average revenue per kilowatt hour for a typical residential customer during this time of rising oil prices.

On the success side, in October 2004, in response to the high fuel prices, CVEA implemented a 3¢ fuel credit program which was continued through May 2005. This program essentially absorbed $1,555,000 of fuel costs which normally would have been passed on to customers through the FPPC. Early in 2006 the Board authorized using 2005 margins and a Four Dam Pool refund to absorb an additional $900,000 in fuel costs over the first six months of 2006.

During this time of rising prices, the historical method of quarterly revision to the FPPC has made increasingly less sense. In 2005 the FPPC dropped significantly to 8.34¢ during the summer generating season, but it shot up to 15.93¢ in October 2005 as we entered into winter generation mode. This huge increase was the result of a combination of factors, the largest of which was the shift from summer to winter operation.

About this same time the Board of Directors began to discuss ways to minimize the drastic changes of transitioning from summer to winter generation mode. As a consequence of those deliberations, in July 2006 the Board of Directors acted to levelize the FPPC over the remaining six months of the year by setting the FPPC rate at 10.94¢ in hopes of avoiding a very large increase as was experienced last year (from 8.34¢ to 15.93¢).

CVEA will continue to explore ways to address price fluctuations and will endeavor to better inform customers of anticipated price changes.

Alternatives to Burning Diesel Fuel to Generate Electricity

Trans-Alaska Gas Line Projects

One of the most significant unknown factors influencing long-term power supply planning is any version of a trans-Alaska gas line (TAGS) project that would come to Glennallen and/or Valdez. If it happens, and depending upon the cost per mmbtu of the gas and the capital investment required to convert it into electrical energy, it could provide economic benefits for generations to come. CVEA's Board of Directors keeps a watchful eye on any version of a TAGS project that would benefit the region but does not assume, for planning purposes, that the project will come to the region in any particular timeframe.

What are the Major Considerations to Address before Using Gas as a Fuel Source to Displace Diesel Fuel

There are a host of economic and technical issues that would need to be considered before a decision could be made to use natural gas. The first would be the price of natural gas at the delivery point and the cost to get the gas to the CVEA power plant. The second issue would be the reliability of the gas resource to include a guaranteed supply and gas conditioning systems. The third would be to determine whether or not to install new units or retrofit existing units in the Glennallen Plant, as they are currently ported to use natural gas.

LNG as a Fuel Supply to Replace Diesel Fuel

The world has a lot of natural gas. Liquefied natural gas (LNG) may be the fuel of the future in certain areas dependent upon liquid fuels. Environmental issues may dictate LNG displaces other liquid fuels. CVEA has had preliminary discussions with potential providers of LNG concerning an alternative fuel source for the Glennallen Diesel Plant. While the cost savings compared to diesel fuel appear marginally favorable, this option must be thoroughly investigated. Some of the considerations which must be carefully evaluated include transportation costs, storage, re-gasification equipment, and the capital cost to retrofit existing reciprocating engines (or new equipment). In addition, availability of long-term supply, price changing mechanisms, seasonal demand versus supplier production limitations, and considerations for supply interruptions are other important considerations. CVEA continues to investigate LNG as a potential alternative to diesel fuel.

Ahtna 1-19 Gas Well

CVEA continues to monitor developments on local natural gas. Specifically the exploratory well site known as Ahtna 1-19, ten miles west of Glennallen and one-half mile north of the Glenn Highway, has been closely tracked. Despite technical difficulties, the operator is hopeful that they can get their well tested before winter. Should natural gas produced by Ahtna 1-19 become available, CVEA will certainly evaluate the commercial opportunity.

Other Significant Issues that Could Impact Power Costs

Can Renewable Energy be Part of the Answer

Interest in renewables seems to be growing exponentially. Economics, the environment, customer interest, a changing regulatory landscape, co-generators and small for-profit power producers, advocates of green power, and federal, state and local politicians are driving expanded investigation in renewable energy.

The addition of alternative generation requires significant research and does not necessarily equate to a reduction in co-op members' electric bills. In addition to the challenge of funding the capital cost associated with adding new generation, the operation and maintenance costs of alternative generation must be incorporated into the evaluation of renewable energy sources.

So What is Renewable Energy

The National Rural Electric Cooperative Association in its White Paper on Renewable Energy published in October 2005 defines renewable energy as follows:

> Renewable energy is wind, solar, solar thermal, photovoltaic, biomass, non toxic biomass, small hydro, large hydro, low impact hydro, pumped storage, digester gas, municipal solid waste conversion, land fill gas, ocean wave, ocean thermal, tidal current, biologically derived methane gas, hydrogen fuel cells, waste coal, coal mine methane, demand side management, energy efficiency technologies, load management, demand response, distributed generations systems, brush, stumps, lumber ends and trimmings, wood pallets, bark, wood chips, shavings, energy crops, small diameter timber, salt cedar and other phreatophyte or woody vegetation removed from river basins or watersheds…

Closer to home CVEA defines renewable energy as energy that is obtained from inexhaustible resources like wood, waste products, bio fuels, geothermal, wind, hydro, photovoltaic and solar. The high cost of fuel for fossil fuel plants certainly keeps us attentive to renewable energy alternatives, but the reality is that many do not make sense for Alaska utilities. While many renewable technologies surely have applications for individual customers, to our knowledge there do not exist projects which could lower the overall cost of electricity for CVEA members. Geothermal projects are unique to the specific resource, temperature and volume of heat energy. At this time we are unaware of any geothermal resources within our service territory.

One of the many challenges with renewables in a utility scale operation is the ability to obtain a reliable source of the fuel or energy. In many cases this results in the need for the utility to continue to maintain the fossil fuel plants as backup.

Wind

The investigation and development of wind energy has become very popular both in the Lower 48 and in Alaska. At the 2006 Alaska Power Association Annual Meeting, several utilities and consultants discussed their ongoing research and potential or developed projects. The most important requirement for wind energy is a well documented wind resource site because no amount of capital can counter a poor site selection. Another key factor is the accessibility to the site for construction/maintenance and cost to connect a potential wind energy project into the distribution or transmission system. The cost for initial capital investment in wind generation in Alaska is estimated at $2,000 per kW; this does not include any transmission or distribution system costs or roads necessary to access the site. Many utilities represented that wind energy would reduce their reliance on fossil fuels but did not state that member costs would be reduced.

CVEA has also been curious about wind energy and recently conducted a field reconnaissance trip in the CVEA service territory with two leading Alaskan wind energy consultants. We used the Alaska Energy Authority's (AEA) wind resource map to identify sites with Class 4, or better, ratings and sites suggested by consumers: Thompson Pass, Willow Mountain in the Copper Basin, a bluff northeast of Gakona, and the Lowe River outlet area of the Keystone Canyon. Even though the consultants agreed with our identification of potential sites from the wind resource maps, it was obvious from their feedback during the field trip that each of the sites has technical challenges and accessibility issues such that they do not fall into the category of low cost or easy to develop.

While evaluating any alternative energy resource, it is important to look at the net cost benefit to the consumer. In the case of CVEA, consumers get almost their entire energy requirements from the Solomon Gulch hydro project for approximately five months of the year (May-September). This means that if we had a wind machine it would not be used during this time. Based on an application for only seven months of the year and the cost per kW of wind machines, our estimates indicate that wind generation (not including the cost to tie the wind units into the transmission or distribution system) is greater than the cost of diesel fuel for diesel generation. At this point it is not cost effective to develop or further explore wind resources.

What about Hydro - Allison Lake

Allison Lake is located 1.5 miles west of the Solomon Gulch reservoir at an elevation of 1,367 feet. In 1992, the AEA had a study completed to provide preliminary designs and cost estimates of several alternatives including a tunnel to the Solomon Gulch reservoir with a hydro plant at the tunnel exit and a stand alone hydro plant at the tidewater level on Allison Creek. The results of this study indicate that a tunnel to the Solomon Gulch reservoir with a hydro plant at the tunnel exit would cost $31 million (in 1992 dollars) for a plant that could produce 27,396 megawatt-hours per year as compared to the stand alone plant which would cost $54 million for 37,250 megawatt-hours per year.

While Alyeska was working on strategic reconfiguration of the Valdez Marine Terminal (VMT), Green Power Development, LLC, filed for a preliminary permit with the Federal Energy Regulatory Commission proposing a project at Allison Lake. Preliminary estimates for a power plant at tidewater with a 4.95 megawatt generation capacity and water resource to produce 20,400 megawatt-hours per year of energy was proposed. Since the strategic reconfiguration has been indefinitely postponed and Green Power does not have a power sales agreement, their project status is unknown. Notwithstanding the high capital cost and the length of time to develop a hydro project, present high fuel prices warrant further study of the Allison Lake Project.

Why Can't We Hook up to Alyeska - Alyeska VMT, PRT, Providing Power to the Oil Tankers

Many have been curious about the challenges and opportunities of providing electric service to the Alyeska VMT. In January 2004 CVEA aggressively explored that opportunity when we were contacted by Alyeska representatives to see if we would consider providing electric service as part of the Alyeska Strategic Reconfiguration project for the pipeline and marine terminal. Over the following 15 months, CVEA developed conceptual models to include the modeling of VMT loads, multiple CVEA generation alternatives, air quality permitting, system load flow studies, primary reduction turbine (PRT), and tie line to connect the CVEA system to the VMT. Preliminary engineering studies had just been completed when, in May 2005, the TAPS owners' group decided to indefinitely postpone the strategic reconfiguration of the VMT.

During the conceptual development of generation alternatives, we discussed a PRT. The basic idea behind a PRT is to take advantage of the crude oil flow in the pipeline to spin a turbine connected to an electrical generator. It sounds easy, but the application is much more complex and would have only provided a portion of CVEA's energy requirements. Simply speaking, the TAPS owners were not interested at that point.

On occasion we hear that we may be missing an opportunity to sell electricity to the crude oil tankers when they are tied up at the VMT loading docks. There are several complex issues that would have to be addressed for this to become possible. First, there is no circuit between the CVEA system and the VMT. The closest primary electric circuit access to the VMT property is 1.9 miles away. The second issue is that a substation would need to be built to tie into the VMT distribution system or a dedicated circuit installed to the dock facilities. The third issue is the generation that CVEA would need to have online as a tanker has the ability to add an additional seven megawatts (with large pump motors) to the CVEA system. This would be a significant increase in load on our current generation resources when you consider that we have system peaks of approximately 13 megawatts and a prime capacity of 18.1 megawatts. Finally, if all of the technical issues could be resolved, there would be the really big question, could CVEA provide electric service to the tankers at a cost that they would find valuable. To date we have never had a tanker company contact CVEA about an electrical connection. In summary, the evaluation of providing electric service to crude oil tankers is unlikely unless there was some reason that tankers were required to take dock side electric service.

Kodiak Electric Proposes Break Up of the Four Dam Pool

In June 2006 Kodiak Electric Association made a proposal to the FDPPA which could lead to the break up of the Pool. The basic elements of the proposal involve using existing FDPPA cash and reserves plus new debt issued by Kodiak to finance the dissolution of the Agency. Ownership of the projects would be transferred to the individual utilities or to a new entity made up of one or more of the existing projects. Existing reserves would be eliminated to help finance the dissolution. Except for Kodiak, the other four utilities would not have any debt service associated with the acquisition of their project. While the proposal has merit, it is not without substantial risk to CVEA.

- The proposal would transfer hydro and transmission line assets. In CVEA's case significant liabilities exist related to avalanche risk on the transmission line that would have to be satisfactorily addressed.
- Assuming ownership of the hydro and transmission line assets without first establishing reserves would not be prudent.
- CVEA is the smallest of the FDPPA projects with annual sales of 50,000 MWH. The cost to operate and maintain Solomon Gulch on a stand alone basis would be more per kwh than we currently pay through FDPPA ownership.

Changes to the current Four Dam Pool arrangement require the unanimous consent of the governing bodies of the five utilities that are parties to the current contract. CVEA's Board of Directors will carefully evaluate the potential benefits of Kodiak's proposal to restructure or break up the Four Dam Pool.

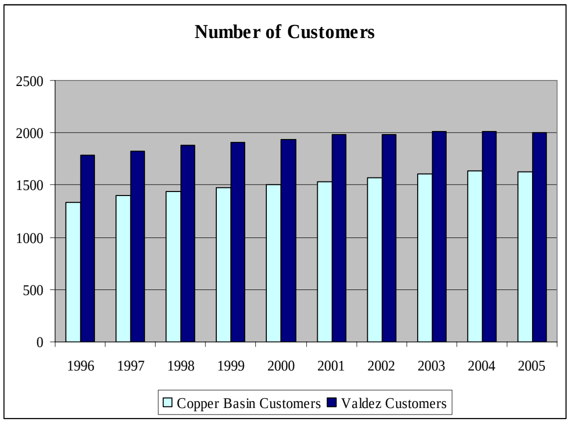
Glennallen Diesel Plant Upgrade Project

CVEA has a project underway to upgrade the generating capacity of the Glennallen Diesel Plant for a planned capacity of 5.4 megawatts. The power reliability criteria for the Copper Basin are to maintain enough prime rated capacity in the Glennallen Plant in the event the southern transmission line and largest unit in the Glennallen Plant are out of service at the same time. The current peak for the Copper Basin is 5.1 megawatts. We are continuing to see modest residential customer growth in the Copper Basin and are aware of plans to add some load to Alyeska Pump Station 11 and at the HAARP facility. In support of this planned upgrade, CVEA applied for and received a grant in 2002 to assist with 50% of the cost of this project.

Appropriations

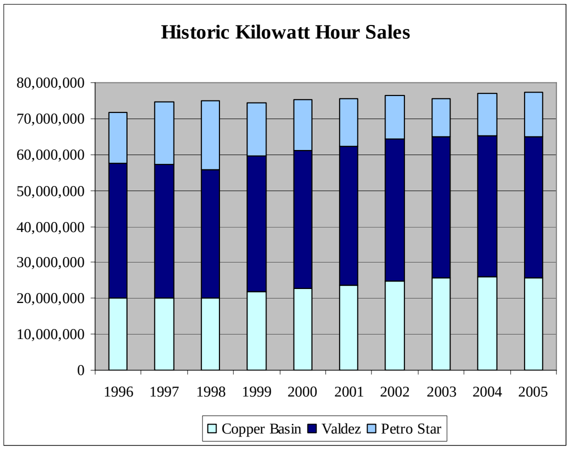
For many years CVEA has pursued federal and state appropriations to fund capital projects. In 2006 the capital budget included a $4.5 million appropriation from the Rail Belt Energy Fund for CVEA. Unfortunately, Governor Murkowski exercised his line item authority to veto $73.5 million of projects for Rail Belt utilities, including the appropriation for Copper Valley Electric.

Financial Health of the Cooperative



For the past decade CVEA has been in a period of virtually no growth on our system in terms of customers and kilowatt hours sales (see graphs). During that same period, the cost of doing business has increased with inflation. These two events have resulted in negative operating margins for many years. Explained another way, the cost of electric operations has exceeded the electric revenues we collect by a substantial dollar amount.

Beginning with the start up of the cogeneration project with Petro Star in 2000, CVEA began to collect a new source of revenues in the form of heat sold to the refinery. Instead of venting the turbine exhaust into the atmosphere, the hot gas is diverted for use as combustion air for Petro Star's crude oil heater. Petro Star purchases the exhaust gas (heat) at the same price per mmbtu as CVEA purchases LSR fuel to burn in the turbine.



Heat revenues, like fuel, change with the price of oil. Since 2000 the cogeneration project has produced over $7 million in heat revenues. Those revenues have been used to erase negative operating margins, help fund the 2004 capital credit retirement of $1.3 million, pay for major nonrecurring expenditures, and have enabled CVEA to absorb, instead of pass through, fuel costs totaling over $2 million in the last two years.

Conclusion

In conclusion, there are no easy answers. CVEA, at the direction of the Board, is investigating options and pursing opportunities to lower members' costs and provide more reliable electrical service. While it may be possible to reduce CVEA's dependence on fossil fuels, it does not necessarily mean that the cost of electricity will be reduced. CVEA is looking for alternative energy solutions that will provide long-term benefits to the entire membership.