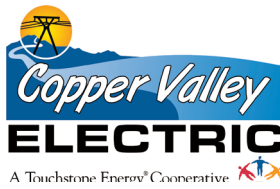


Copper Valley Electric Association

Strategic Issues Paper 2015





Dear Member,
March 2015

In an effort to better communicate with members, Copper Valley Electric Association published a Strategic Issues Discussion Paper in 2006 and 2011 to bring you up to speed on some of the difficult issues facing CVEA. A lot has happened since the last publication; the Cooperative has faced severe weather issues including the 'Damalanche' of 2013 and flooding of the Lowe River two years in a row. The Thompson Pass Transmission Line Relocation Project is nearly complete, and construction on the Allison Creek Hydroelectric Project has begun. This *CVEA Strategic Issues Paper 2015* is intended to provide you with updated information on projects we've been working on, issues that we face, and opportunities we are evaluating.

It is our goal to provide CVEA members with a complete picture of the major issues and opportunities facing their Co-op. To accomplish this task, this paper is broken into six separate sections:

1. Cost of Power and Financial Matters
2. Power Supply Planning - Major Projects
3. Alternative Energy Opportunities
4. Keeping the Lights On
5. Beyond Our Borders
6. Commitment to Community

This paper contains a lot of information, yet it is quite probable that it leaves many of your questions unanswered. We want to answer those questions. Please plan to attend the annual meeting to give us that opportunity and to hear updates on some of the subjects addressed in this paper. The Annual Meeting of Members is scheduled for Tuesday, April 14, 2015, in the Copper Basin and Thursday, April 16, 2015, in Valdez. If you don't wish to wait for the annual meeting, please direct your comments or questions to Sharon Crisp, Manager of Member Services, at 822 5506, 835-7005, or email crisp@cvea.org.

We hope you find the *CVEA Strategic Issues Paper 2015* helpful in updating you on current issues facing CVEA, and we look forward to your feedback.

Sincerely,

Will Stark
President, Board of Directors

Robert A. Wilkinson
Chief Executive Officer

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www.cvea.org

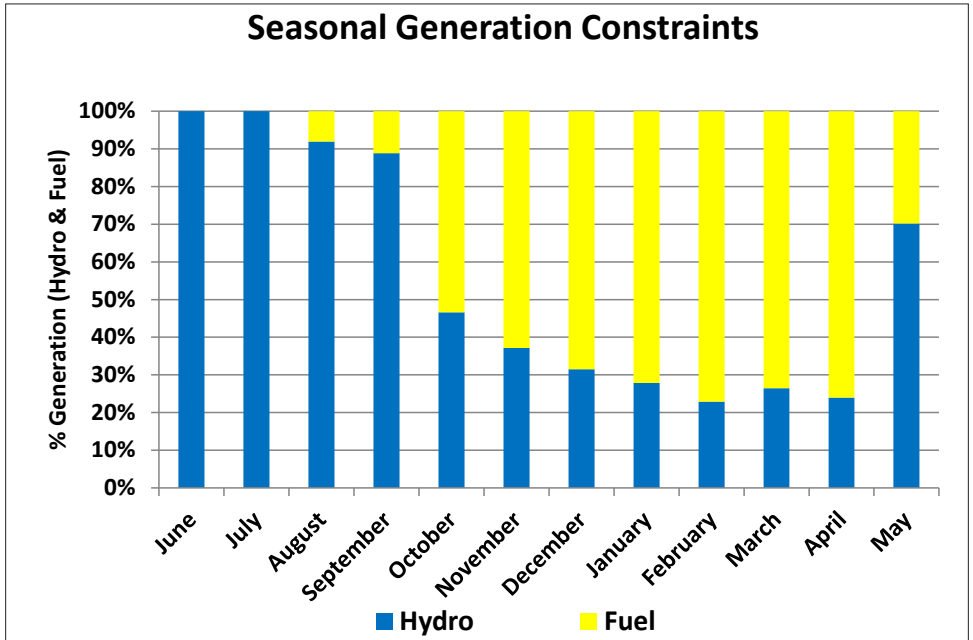
Copper Basin (907) 822-3211

Valdez (907) 835-4301

Cost of Power and Financial Matters

Cost of Power

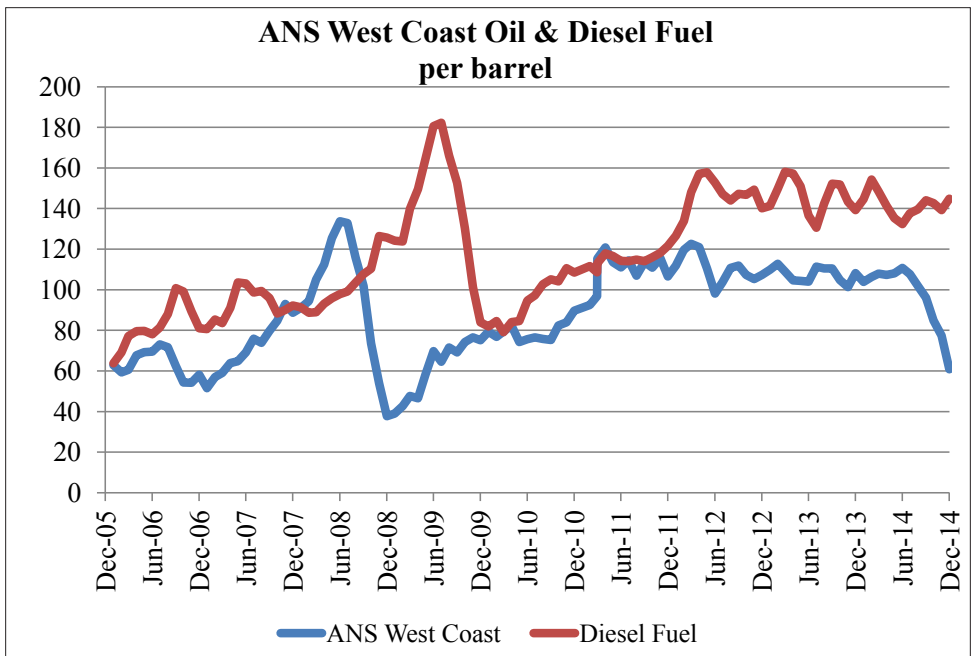
CVEA generates electricity with hydropower and fossil fuel power plants. The Solomon Gulch Hydroelectric Project has seasonal generation limitations due to the size of the reservoir and inflows from snowmelt and rain. In summer, which we define as June through September for power generation purposes, the hydro will produce nearly 100 percent of system requirements. Beginning in winter, defined



as October through May, we first bring on the Cogeneration Project and then the diesel plants to produce the energy that cannot be supplied by the hydro. Over the course of a typical year Solomon Gulch provides 50 percent of system requirements, the Cogeneration Project 25 percent and the remaining 25 percent from the diesel plants. These seasonal constraints are illustrated on the chart above.

The aforementioned seasonal constraints also affect the price of electricity. CVEA rates include a G&T charge to recover the cost of generation except for the cost of fuel. The G&T charge is a flat charge collected monthly. Fuel is collected as a separate charge and is only col-

ANS West Coast	Summer Avg Rate ¢ per kWh (June-Sept)	Winter Avg Rate ¢ per kWh (Oct-May)
\$50	17.50	22.62
\$60	17.57	23.55
\$70	17.65	24.49
\$80	17.72	25.42
\$90	17.79	26.36
\$100	17.87	27.29
\$110	17.94	28.23
\$120	18.01	29.16



lected when we are running the cogeneration or diesel power plants. As a general rule, during the summer, when hydro is meeting most of our generation needs there is not a big fuel charge. Conversely, during winter when most of our generation comes from the fossil fuel plants the fuel charge can be very large. The table on page three illustrates the average rate difference between the summer and winter generating seasons under different oil price scenarios.

Fuel prices change with the price of oil. ANS crude oil averaged approximately \$110 per barrel from March 2011 to July 2014. Beginning in August 2014, ANS crude oil prices dropped to \$60 per barrel, as seen by the blue line on the chart above. The red line is CVEA's diesel fuel price which, for reasons we do not fully understand, did not follow the same downward trend as ANS oil prices.

The fuel cost charged to members is a direct pass through from CVEA's fuel supplier. CVEA does not mark up the cost of fuel. As part of the commercial transaction with Petro Star, CVEA purchases fuel for the turbine and Petro Star, in turn, purchases turbine exhaust heat from CVEA. When the Cogeneration Project is operating and producing heat revenues these revenues, are returned to members in the form of a heat credit on winter power bills.

The future of oil prices is unknown but continues to present a challenge for CVEA. When Allison Creek comes online in 2016, CVEA's dependence on fossil fuel lessens by approximately 14 percent per year bringing hydroelectric generation to 64 percent of CVEA's generation portfolio.

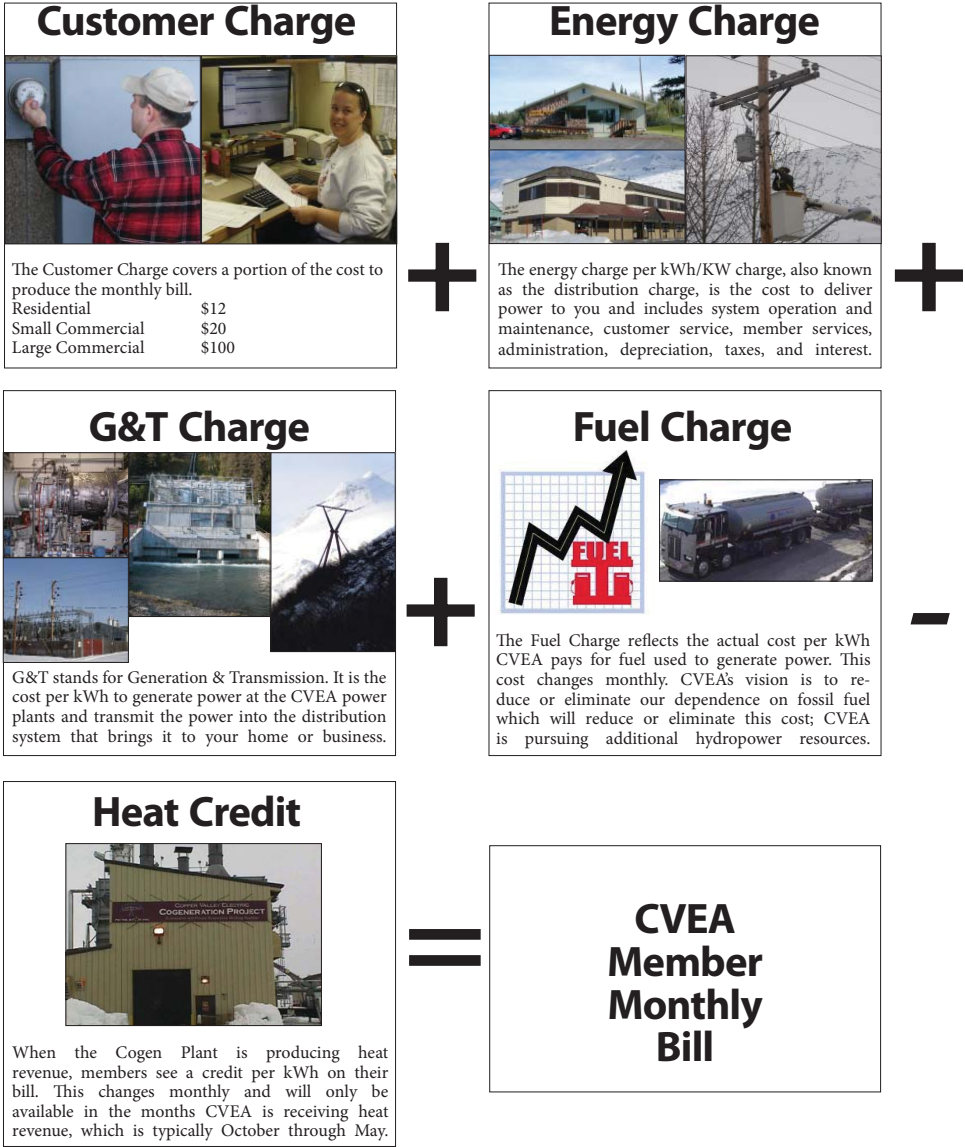
Rate Structure

CVEA completed a rate study and cost of service analysis in early 2012.

There were four primary goals of the exercise:

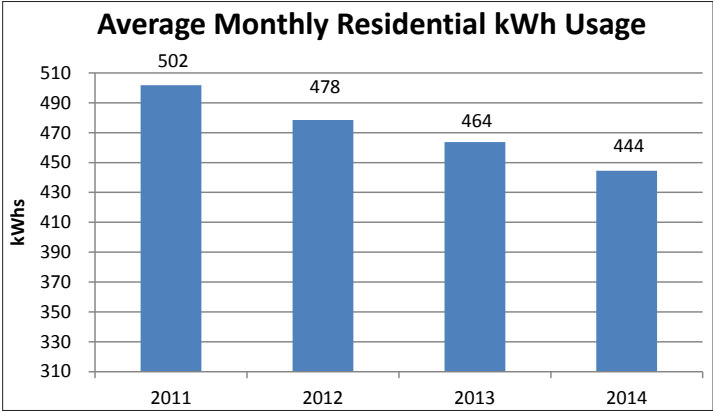
1. Ensure economic viability of the utility
2. Decrease the risk from loss of heat revenues from a Cogeneration Project outage
3. Stabilize rates
4. Make rates understandable

Beginning in June 2012, a new rate structure was implemented. The following illustration describes the components that make up the new structure.



Declining Energy Sales

Many factors have led to declining energy sales in recent years to include a general economic downturn in the region caused, at least in part, by high energy costs. High energy prices have also led customers to conserve and to implement energy efficiency measures at their homes and businesses. The average kWh usage per residential customer has declined by 11.5 percent in the last four years. Declining energy sales presents a challenge for CVEA in maintaining stable electric rates.



Environmental & Regulatory Issues

The Environmental Protection Agency (EPA) and other regulatory agencies are constantly changing standards, laws and rules. It is CVEA’s responsibility to keep up with these changing rules. There is no requirement by the government to inform us that a new rule change affects us. This means that someone on the staff must watch, interpret and assess new rulemakings from EPA and others on an ongoing basis.

Under the current administration, rule makings and changes added a staggering 79,000 pages to the Federal Register in 2014 alone. Despite that, some rules affect CVEA more than others. In rare cases, waivers to these rules can be obtained if properly justified. As an example, CVEA successfully avoided a very costly rule that would have required catalysts to be installed on all our diesel exhaust mani-



folds. The equipment and installation alone would have cost CVEA members \$500,000. With a significant effort, CVEA avoided the requirement and costs associated with it. Despite this success, other rules have been levied upon us that require additional equipment, supplies, staff hours, and sometimes consulting assistance.

Going forward, environmental rule impacts are expected to demand more resources. CVEA's response to these changing standards is to use every means available to inform Legislators, our Congressional Delegation and Regulators of the impact on the Co-op's ratepayers. We have taken an aggressive approach to learn about changing standards before they are approved as law and provide input regarding their impact to our members.

CVEA is actively involved in the Environmental Regulations Committee of the Alaska Power Association (APA). Our involvement has resulted in APA-sponsored resolutions to curb some of these costly regulatory changes. Despite this, the regulatory burden of today's environment has and will continue to have an impact on electric rates.

Power Supply Planning - Major Projects

Allison Creek

It's hard to believe that in the last Strategic Issues Paper, Allison Creek was just a concept on paper and now it is a reality.

The first construction season in 2014 was hugely successful and the project is set for the next construction season to follow suit. As of this article, the weathered-in powerhouse is sitting through its first winter awaiting equipment installation in 2015.

The powerhouse equipment, which required a two-year lead time, is built, tested and sitting in Valdez ready for installation. The first 13 sections of penstock, from the powerhouse up the steep hill to the tunnel entrance, are installed. The challenging lower access road, upper access road, and tunnel are also complete.

In addition, the bypass culverts are in the ground at the diversion structure site. The culverts will channel the water in the creek around the diversion structure site for dry construction in 2015.

Work planned for 2015 includes installing and burying the remaining portion of the 7,000 feet of penstock; building the diversion structure; constructing the com-





munications building; constructing the switch-station; installing the emergency generator; and connecting the feeder line into the CVEA system.

By the end of 2015, CVEA will have completed nearly everything except the operational checks, training, manual development and handoff from the contractor to CVEA. Those activities will take place in 2016, and then commercial power will flow into the CVEA system for the first time.



Tiegel River

Despite the addition of Allison Creek in 2016, CVEA continues to look for ways to solve our winter energy problem. We are too dependent on costly fossil fuels and we continually strive to find a renewable energy source that provides winter power. One possibility is the Tiegel River.

In 2012, CVEA received a \$500,000 State grant to perform a reconnaissance study of the Tiegel watershed. That reconnaissance-level evaluation indicated that Tiegel River has potential for hydropower development that could:

- decrease CVEA dependence on fossil fuels,
- increase inventory of renewable energy sources,
- provide power to new regional customers (residential and/or industrial), and
- increase reliability for the northern half of CVEA's service territory in the event of a transmission line outage.

Five project concepts on the main stem of the Tiegel River were developed to represent the available range of storage projects (i.e. year-round power). These five storage projects appear to have technical merit, warranting further investigation, and none appear to contain environmental constraints that would preclude development. The project development driver appears to be economic.



The study showed that the Tielkel drainage area was not optimal for a hydropower storage project. The terrain is lacking the ideal V notch in which to build a dam. This missing feature means a large dam is necessary to build a storage project; large dams mean high costs. Even under the best scenarios, CVEA would not be able to obtain the funds necessary to complete such a large scale project.

CVEA has promoted Tielkel River to the Alaska Energy Authority, Alaska Legislators and members of the Governor's staff. Given the fiscal difficulties of the state in 2014 and 2015, it is unlikely the Tielkel River Project will be re-visited in the near future.

New Valdez Generation

CVEA owns, maintains, and operates four power generating facilities: the Glennallen Diesel Plant in the Copper Basin, and the Solomon Gulch Hydroelectric, Cogeneration, and Valdez Diesel Plants in Valdez.

The diesel plants are typically used for winter generation and peak loads in summer. The diesel plants are also relied upon in the event of a power outage to restore power in a timely manner.

The diesel plants are the oldest plants on the Co-op's system; Glennallen was commissioned in 1954 and Valdez in 1965. While improvements have been made in the Glennallen Diesel Plant in the last decade, replacing two old units and adding additional capacity, the newest unit in the Valdez Diesel Plant was manufactured in 1976 and is now being used only for emergency purposes out of concern the unit will experience a mechanical failure.

To address this potential reliability concern, CVEA is currently evaluating the purchase of two used Caterpillar diesel reciprocating generators to replace the failing unit. These units, coming from the Lower 48, are in 'like new' condition as they were only used as standby electrical generation and have less than 2,000 hours of operation. These units have a fuel efficiency rating of 1.9 times greater than the

unit that they are replacing and have lower emissions. The newer units will have a higher level of reliability based on the proven track record with a similar unit in operation at the Glennallen Diesel Plant.

CVEA will be working on engineering design and environmental permitting in 2015 with installation of the replacement units taking place in 2016.

Alternative Energy Opportunities

Wind

In 2011 CVEA undertook a wind assessment program. The purpose of studying wind was to find out if the right kind of wind is available for a commercial wind generating project in CVEA's service territory. Ideal wind for a project blows in a consistent direction at a constant speed.

Wind turbines are very particular with the speed of the wind needed to generate electricity. A typical commercial wind turbine does not begin generating electricity until the wind speeds reach 10 mph, and at that speed it only generates 10 percent of the rated output of the machine, i.e., a one megawatt (1,000 kilowatts) turbine would only produce 100 kilowatts. The turbine will shut itself down if wind speeds reach between 45 and 55 mph, depending on the model, to prevent damage to the unit.

In 2010 CVEA received a \$100,000 grant from the State of Alaska to purchase and install two 50 meter meteorological (MET) towers, and evaluate the wind potential within our service territory. Instrumentation on the MET towers measure the wind speed using both standard and heated anemometers, wind direction using wind vanes, and air temperature. Data is collected by data logger and emailed daily to CVEA. As discussed in greater detail below, the Cooperative utilized a meteorologist and wind power expert to analyze and validate the data in order to determine if the site could be a viable location for a wind project. CVEA also worked with the wind energy division of the Alaska Energy Authority to validate and review the data.

The Cooperative installed the first of the two towers at the 10-mile area in Valdez in July 2011. This site was CVEA's second choice, but the first option was withdrawn from consideration due to potential scenic viewshed issues voiced by the Valdez Mayor's Energy Task Force. This 10-mile tower remained in place collecting data until July 2013. Data collected indicates that this location is not suitable for a commercial wind project. The average wind speed at this location is only 10.8 mph, and the wind speeds were too low 54 percent of the time to cause the turbine to spin.

Another data point reviewed for a commercial wind project is the capacity factor, or the percentage of energy you would expect to generate from the turbine compared to the total potential energy it could produce. Typically a wind project would need at least a 30 percent capacity factor to even be considered worth pursuing.

The 10-mile location generated capacity factors of 23.8 percent utilizing a GE 1.5 XLE turbine and 27.9 percent with a GE 1.6. Turbulence, another factor at this



location, was classified at a category A which is the highest level of turbulence, once again an indication that 10-mile was a poor location for a commercial wind turbine.

Tolsona Ridge, in the Copper Basin, was the site selected for the second MET tower which was installed in August 2012. Tolsona Ridge is located 20 miles west of Glennallen on the Glenn Highway. Wind at this site is more consistent from month to month but is still relatively low with an average of 12.5 mph, with wind speeds too low to spin the turbine 37 percent of the time. The capacity factors at this location were 26.2 percent utilizing a GE 1.5 XLE turbine and 32.9 percent with a GE 1.6.

Wind direction at Tolsona is not consistent and unable to generate electricity 76 percent of the time. The Tolsona Ridge site is a much better location than 10-mile for a potential turbine location; however, the location is still not viable for a commercial wind generating project.

The 10-mile tower was redeployed in the Copper Basin near the Gakona Bluffs, two miles north of the Tok Cutoff Junction, in 2013. Data from this location was almost identical to the Tolsona Ridge site, but with even lower wind speeds. The average wind speed was 7.4 mph providing a capacity factor of just 13.6 percent, not enough wind to spin the turbine 60 percent of the time.

The MET towers were decommissioned in September 2014. The data has solidified the wind energy maps of Alaska proving that commercial grade wind that is accessible and feasible for connectivity into the CVEA electrical system does not exist within the CVEA service territory.

Furthermore, with the addition of the Allison Creek Hydroelectric Project, the abundance of hydroelectric energy would reduce the need for additional generation in the summer months.

Hydrokinetic

As the name implies, hydrokinetic energy is the potential energy which could be recovered from moving water. There are two methods for harnessing this energy: tidal, which uses the flow of ocean current during the transition from low to high tide and back, and river, which uses the flow of a river, either with a submerged or surface floating device, without diverting or damming the river.

Both of these technologies are in their design and implementation infancy and are relatively new in regards to utility grade electrical generation, and even newer to the state of Alaska.

At this point these technologies are still small in scale regarding energy output; 250 kilowatts or less, and high in costs, 40-50 cents per kilowatt hour. Neither tidal nor river hydrokinetic generating systems have been placed into commercial operation in Alaska as most are still in the research, development stage and testing stages.

As of December 2014 it was reported by Bloomberg Business Week that many marine power companies, who are attempting to develop ocean generating power, are “going out of business” because it “is tougher and more expensive than people thought”.

Geothermal

Geothermal energy projects capture energy from the Earth. Field studies to assess geothermal potential are capital intensive and require deep drilling to determine subsurface liquid temperatures.

At least one Alaskan utility has declared bankruptcy while pursuing potential geothermal resources in an effort to reduce their dependence on fossil fuel generation. Deep thermal wells require ‘oil and gas drilling’ protocols that are not conducive to geothermal wells, these protocols played a large part in the recent Alaskan utility bankruptcy.

Two known potential resources for geothermal energy for Valdez and the Copper Basin are the Klawasi Hot Springs.

According to a state of Alaska geothermal resource map, Upper and Lower Klawasi have surface temperatures of 63°F and 68°F, respectively. With newer technologies, geothermal generation plants have been implemented that require as little as 135°F liquid temperature. It does not appear these wells have temperatures that would support a geothermal electrical project.

The Klawasi thermal wells are located on native corporation land and are surrounded by the Wrangell-St. Elias National Park and Preserve, which significantly limits the ability to further assess or develop those wells as potential resources.

Biomass

Alaska has an abundance of natural resources that can be used to provide energy. Unfortunately, some resources are hard to get to or hard to get to the market. For the Glennallen area, biomass is one such resource.

There is a staggering supply of biomass resources surrounding the Glennallen area for use in making energy. For that reason, CVEA carefully studied the use of biomass for making electricity.



In 2011, CVEA conducted an extensive review of biomass. This review was a three-pronged effort looking at the viability of biomass through an internal study, a literature search combined with expert testimony, and through an independent consultant analysis.

Here are the key results of this three pronged review:

- Wood biomass is plentiful in Alaska and plentiful in the Copper Basin but it is not abundant as an “opportunity fuel” in the Copper Basin
- An “opportunity fuel” is normally a byproduct of some manufacturing process such as a saw mill or lumber company; it normally means the fuel is free or very cheap and its source is located close to the biomass facility, reducing or eliminating transportation costs
- Most examples of successful biomass projects are located in the Lower 48 utilizing “opportunity fuel” biomass
- Most successful biomass projects rely mainly on heat revenues and not power production revenues

There are only a few examples of successful biomass projects in Alaska. These projects would not have been successful without state assistance. In some cases, biomass is an “opportunity fuel” such as recycling materials or biomass created by forest fire management in the Division of Forestry. At the date of this report, none of these projects are producing power with biomass.

Given the unavailability of “opportunity fuel,” CVEA would need to purchase biomass, transport that biomass, store the biomass in a way to keep moisture down, and then feed the biomass into a furnace. The more you handle this fuel, the more expensive it gets. Using realistic cost estimates, the independent consultant’s analysis shows the cost of power for biomass at two to three times higher than the cost of power with diesel.

The reliability of power created from a biomass furnace would likely be a problem for CVEA. A biomass furnace has a slow reaction time to changes in load and it takes several hours for startup and shutdown. Biomass generators do not have the capability to be started remotely under a power outage condition, unlike CVEA’s

diesel generators.

Future emission regulations are unknown. The EPA has a temporary deferral on biomass emission limits, but this temporary deferral will end in two years.

The result of CVEA's biomass study concluded that biomass is not a viable option for producing power. It would reduce reliability and increase rates.

Net Metering

CVEA implemented the Net Metering Program in 2012 when member interest in renewable energy alternatives, like wind and solar, increased in popularity.

Net metering allows an eligible consumer to connect an approved renewable energy generation system to the CVEA grid in order to offset their normal usage and sell back excess energy to the Cooperative.

After a thorough conversation including an open comment period and two public meetings, strict eligibility, availability, and interconnection standards were put in place for the protection of both the Cooperative and the consumer. These protections make electric system safety and reliability a top priority. The standards adopted are very similar to those of other programs implemented elsewhere in the state of Alaska.

Eligibility

To be eligible, a consumer generation system must produce electric energy derived from one or more renewable resources to include the following:

- Solar photovoltaic or solar thermal
- Wind
- Biomass
- Hydroelectric
- Geothermal
- Hydrokinetic
- Ocean thermal

The system must be operated, and either owned or leased, by a consumer that purchases retail electric utility service from CVEA. It must also be located on the consumer's premises, be used primarily to offset part or all of the consumer requirements for energy, be compatible with the Cooperative's system, and have a total nameplate capacity of no more than 25 kW. In order to protect the Member and the Cooperative, there is also a minimum liability insurance requirement that must be met prior to interconnection to the CVEA system. A standard homeowner insurance policy has been found to be adequate in most cases.

Availability

Participation in the program is generally available to eligible consumers on a first-come, first-served basis with a few specific exceptions. There exist specific and overall system limitations that can limit the number of consumers that can participate in the program. Specifically, the total nameplate capacity of all participants in the program may not exceed 1.5 percent of CVEA's average retail demand, which at present is 210 kilowatts.



Interconnection may also be denied if a particular installation is expected to result in system stability constraints or create other operational issues.

Interconnection

Interconnection requirements are outlined in CVEA's Tariff; these requirements exist to ensure the safe and reliable operation of the consumer-owned alternative generation system that will be connected to, and operated in parallel with the CVEA system.

The process for a member to participate in the program is straightforward and has been in place since 2012. The complete details of eligibility, availability, and interconnection requirements are outlined in CVEA Tariff 3, Section 17. Anyone interested should first review Section 17 of the Tariff, which can be found on cvea.org.

Members interested in installing a net metering generation system at their home or business are required to submit an application. The application is written in such a way as to ensure the consumer understands the requirements and what it takes to meet them. A trained CVEA representative is available to help the applicant as they work through this process. We cannot stress enough the importance of carefully following and complying with the application process.

Since the implementation of the program in 2012, six CVEA members are currently generating power utilizing approved solar generation systems.

For each consumer participating in the program, CVEA measures the net electric energy during each monthly billing period. Most consumers participating in the program will simply offset their usage. If CVEA continues to provide more energy than the consumer generates, standard CVEA rates will apply.

For consumers whose monthly usage is less than their monthly generation, their account will be credited with an amount derived by multiplying the kilowatt hours

of net electric energy supplied back to the Cooperative by the Nonfirm Power Purchase Rate, or average avoided cost of fuel. This rate is calculated periodically, at least every 12 months to reflect current fuel costs. The Nonfirm Power Purchase Rate as of January 1, 2015, is 13.33 cents per kWh.

In 2014 the six installations, which have a nameplate capacity of 33.15 kW, have sold 14,710 kWh back to CVEA and collected \$1,956.43 for that energy. Those same six customers also purchased 13,951 kWhs from CVEA during months when their location used more energy than was produced by their project. Purchases from CVEA, in these cases mostly in the winter months, are at tariff rates.

CVEA is presently evaluating the two-year old program in light of the development of the Allison Creek Hydroelectric Project. In 2016, when Allison comes on-line, the Cooperative will have surplus hydroelectric energy in the summer months.

This circumstance could affect the Nonfirm Power Purchase Rate paid to net metering consumers who install their projects after Allison Creek comes online. These changes, like all changes to the CVEA Tariff, will be noticed to members and there will be an opportunity for member comment.

Please note, this paper does not contain detailed information of all of the eligibility, availability, and interconnection requirements. All information can be found in the appropriate sections of the CVEA Tariff located at <http://www.cvea.org/resources/pdfs/tariff.pdf>.

Keeping the Lights On

Weather

In a perfect world, the lights would turn on every time you flip the switch and the lights would stay on until you flipped the switch to turn them off.

While many of us living in Valdez and the Copper Basin believe this is the perfect place to live, the reality is there are many obstacles that keep the lights from staying on.

We live in an area of great distances, extreme weather and rugged terrain.

CVEA's service territory encompasses an area roughly the size of West Virginia with two distinct climate zones and terrain extremes. CVEA has over 100 miles of 138 kV transmission line and many hundreds of miles of distribution lines that dissect the region bringing power to our 3,800 customers.

The average annual snowfall in Valdez is 339.7 inches, and long periods of -50°F ambient are not uncommon in the Copper River Basin between November and





February. We get hurricane force winds, blowing snow, rime ice buildup, and snow and ice packed roads; not to mention an avalanche now and again.

Extreme weather, distance, and difficult or hard to access terrain are commonplace within the CVEA service area which greatly complicates our mission to provide reliable power in ways most electric cooperatives across the nation wouldn't understand.

Permafrost continually wreaks havoc on both transmission and distribution structures thereby increasing maintenance requirements. Heavy snow and rime ice buildup on trees often causes them to fall into energized lines including trees from outside our permitted right of way. That same heavy snow and ice can build up on conductors and structures causing them to fail as well.

Deep snow buries equipment making it difficult to find, let alone access. Strong wind may blow trees into our lines or severely reduce visibility. The weather can make it extremely difficult for linemen to respond to assess the situation and restore power.

Poor road conditions, high winds, blowing snow, and extended periods of darkness in winter make it difficult to determine the cause of outages.

It is not possible to design a distribution system that can take anything and everything Mother Nature has to offer while still being financially responsible or aesthetically pleasing.

With all that said, CVEA's mission is to provide exceptional customer service through safe, reliable, cost-effective electric service and programs. Safety is the number one priority. The Co-op must also deliver reliable electric service while maintaining our fiscal responsibility of protecting the financial health of your cooperative.

Statistics

The average percentage of time that the power has been on for each CVEA member over the past five years is 99.91 percent. CVEA does not take comfort in this num-

ber, however, and we continue to look for ways to make improvements.

Weather has been the number one cause of outages each year for the past five years. The five-year annual average of outage time, per customer system-wide, that can be attributed to weather is 2 hours and 42 minutes. This statistic does not tell the complete story; however, as the Copper Basin District routinely bears the brunt of weather-related outages both in number of outages and in total outage duration.

The Copper Basin contains the vast majority of distribution line, great distances, and also has a much smaller population density compared to the Valdez District, therefore, most weather-related outages affect only a small number of customers but experience the longest response times. Some years, the average total weather-related outage time per Copper Basin customer is up to five times longer than what the average Valdez customer experiences. Copper Basin customers in the far reaches of CVEA's service area, such as Sheep Mountain or Lower Tonsina, are likely to experience outage hours slightly longer than the district average.

While we certainly can't control the weather, we can do things to help counter the effect of the weather on our system. Right-of-way clearing is an ongoing maintenance item that we continue to perform annually. We have also embarked on a recurring annual substation inspection program to ensure those critical assets are in good condition. Things such as these do make our system more robust but unfortunately we will never be able to eliminate weather-related outages.

Some outages do have a silver lining. On average, each member experienced about 45 minutes without power annually as a result of planned or scheduled outages. These scheduled outages allow the Cooperative to perform needed maintenance and upgrades to the system. Scheduled outages are also needed for new construction. CVEA does try to keep planned outages to a minimum, but the resulting benefit of improved reliability is worth the inconvenience.

The electric utility industry measures performance in terms of reliability, as related to the percentage of time the average members' power is on during a given time period. This number is calculated as an average for all members so the actual time on each member experiences may be more or less time than the system average.

Outage Communications

CVEA understands that members are interested in information regarding outages; members would like to receive outage updates during outages as well as outage details including who was affected, how long they are, and what caused them. The Cooperative is committed to providing members outage information.

For several years, CVEA has worked to develop an Outage Communications Program that provides outage information to members. Currently CVEA provides updates during outages, and additional details of outages are provided on cvea.org and through other media channels after outages.

When Does CVEA Report Real-Time Information on Outages?

CVEA reports real-time outage information under the following circumstances:

- For district or system-wide outages expected to last more than 1 hour
- For major distribution feeder outages expected to last more than 2 hours

- For any outage affecting more than 10 customers expecting to last more than 2 hours

Please note that members should not expect real-time outage information if an outage does not meet the criteria above. It is CVEA's priority to provide real-time outage information during extended outages so members can prepare their homes, businesses, and families to be without power for lengthy periods of time.

We ask that members recognize that the Plant Operator's FIRST priority is to assess the situation and then develop a plan to get the lights back on. The process includes locating the cause of the outage, calling appropriate personnel, bringing additional generation online as necessary and energizing distribution lines to restore service to customers.

Depending on weather, time of day, cause and location, these activities can take minutes or hours, therefore this information is not always available immediately.

CVEA does provide updates as soon as information is available, so if you don't see it initially, please be patient and check back.

How Does CVEA Report Real-Time Information on Outages?

- Call the after-hours emergency voicemail system at 1-866-835-2832; real time information is updated on the voicemail message system for those calling in as Operators are not always available to answer the phone during power restoration
- Visit the CVEA Facebook page
- Visit www.cvea.org; Facebook updates can be viewed on the cvea.org homepage



Outage Webpage

CVEA launched a new web page on cvea.org intended to provide members with outage details.

Members can gather information on the number of outages by month and by cause, view copies of press releases sent to the local media, and find copies of Ruralite articles that focus on outages and projects related to outages.

Interested members are encouraged to visit cvea.org and click the Outage Communications link located in the text and under Quick Links on the homepage.

If you experience an outage, make sure you have not blown a fuse or tripped a circuit breaker, and then call CVEA during normal business hours at 822-3211 or 835-4301. After hours, call (866) 835-2832. This will help us determine the location and possible cause of the outage.

Thompson Pass Relocation Project

The transmission line that connects the Copper Basin to Valdez is more reliable



thanks to completion of the effort to re-route nearly four miles of the line in Thompson Pass out of a high risk avalanche zone. Since being built in the early 1980s, avalanches destroyed portions of the line five times with a total cost to repair of over \$2.675 million.

It has long been the goal of CVEA to relocate this line out of the avalanche danger zone. The 2014 construction was the culmination of years of study, development, permitting, and design that included state agencies, public input, and our industry partners on the project.

Now that construction of the new line has been completed, focus will turn toward removal of the 21 original structures, predominantly on the east side of the Richardson Highway. The goal is to have this work completed by the end of March 2015.

Low e River

Erosion of the north bank of the Lowe River at approximately Mile 18 of the Richardson Highway has encroached into the transmission line right of way in recent years. A flood in 2012 eroded a significant amount of river bank from around one of our structures east of Sheep Creek, and in both September 2013 and 2014 major flooding west of Sheep Creek washed out a structure and its





temporarily located replacement structure.

In response to the 2013 flood, we undertook a study to evaluate all structures along a 1½ mile stretch of the river from Heiden View Subdivision to the west past Sheep Creek. The draft study results were received in July 2014 and were being evaluated when, in early September, the second major flood in as many years struck this area.

A crisis management team was assembled to determine the best solution for the short and long term. The option selected was to maintain the existing route but to reset the high risk structures in 30-inch steel caissons driven 30 feet or more into the riverbed. The washed out structure was reconstructed in its original location using this technique and an adjacent high risk structure was also reset in caissons. The line was restored to service in just 10 days.

Of the 12 structures addressed in the study, 6 are considered high risk. To date, three have been reset in caissons and are fortified against future flood events. The goal for the remaining three high risk structures is to reset them in caissons during 2015. All 12 structures in this area will be continually evaluated with appropriate mitigation actions taking place as required.

R&R Fund

In 2009, CVEA acquired the Solomon Gulch Hydroelectric Project. As part of the transaction, CVEA received \$16.6 million for assuming the risks and responsibilities of owning the project.

This money was deposited into a renewal and replacement fund (R&R Fund) to help fund future system improvements, major maintenance and

	Total Allocated	
Starting Balance Feb 09	\$	16,646,393
Total Interest	\$	1,133,018
Total Contributions	\$	1,575,000
Total Expenses	\$	(10,550,081)
12-31-14 Balance	\$	8,804,330

capital expenditure projects for Solomon Gulch, and to position CVEA financially to carry out its ownership responsibilities. In June 2013, the CVEA Board of Directors repurposed the R&R Fund to cover major expenditures for all power plants.

As you can see, from the table on the preceeding page, a lot more money is going out of the fund then is coming in. Expenses paid for by the fund since 2009 include 30 year overhauls of both hydro units, new electronic governors for the hydro units, relocation of the Thompson Pass line and a host of other major maintenance projects to get the system in top shape.

Sustainability of the fund is critical to stabilizing electric rates. In 2015 CVEA will be working on a plan to achieve that objective.

Beyond our Borders

Aging Workforce

The aging of the American workforce has emerged as a critical issue facing American productivity in the 21st century. As the 'Baby Boomer Generation' reaches retirement eligibility, the impact will be felt across both the public and private sectors. These 78 million individuals born between 1946 and 1964 have accumulated a wealth of experience and knowledge, and represent 44 percent of America's workforce.

For electric utilities, whose service quality and reliability depends on maintaining an adequate, knowledgeable workforce, managing the upcoming retirement transition is a particular challenge. More than 50 percent of the utility workforce is age 45 or older.

According to the U.S. Bureau of Labor Statistics 30 percent or more of the existing utility workforce is now eligible for retirement. A study by the Center for Energy Workforce Development in 2007 revealed that 40-60 percent of utilities' skilled workers and engineers started retiring in 2012. It further concluded that growing demands for electricity would lead to an even greater demand for skilled workers in the years ahead, as companies make major investments in new power plants and energy efficiency.

Here today, CVEA finds itself right at the center of this storm. In the last five years, 15 percent of the Cooperative's workforce has retired. In the next 5-10 years 48 percent are within retirement age. CVEA has made significant strides in addressing this issue by creating workforce development initiatives that will help meet future needs for skilled employees.

Power Plant Operator Trainee positions were created to promote hiring local candidates who are energetic, enthusiastic, hard working, quick learning, and looking for a career in power plant operations with CVEA. It is preferred that trainees have a background in the mechanical, electrical, plumbing, or power plant operations fields, but not required; the Trainee position receives two years of hands-on training on the various functions of the job.

Currently there are three Trainee positions involved in the two-year training pro-

gram, with the potential for additional positions opening in the future. The program will allow Trainees to work with seasoned Operators learning how to operate the power plants and perform dispatching. As seasoned Operators retire, Trainees nearing the completion of the training program step into the Operator position. This program helps to bridge the large learning curve associated with becoming a Plant Operator.

In addition to Plant Operators, two of CVEA's six Linemen retired in 2014, and took with them 40 years of experience just at CVEA. CVEA currently has no Lineman trainee or apprenticeship program; however, for those interested, an apprenticeship program through the Alaska Joint Electrical Apprenticeship and Training Trust (AJEATT) would provide the needed skills and knowledge to work on the distribution, transmission, and substation systems of an electric utility. Interested candidates must apply and be accepted to this program.

CEO Replacement

According to the National Rural Electric Cooperative Association (NRECA), 40 percent of industry Chief Executive Officers and 22 percent of Senior Managers are eligible for retirement. This is true for CVEA's CEO, Robert Wilkinson, who retires effective June 1, 2015, after having served as the Cooperative's CEO for 18 of his 28 years with CVEA.

After a focused internal application and interview process, in January, CVEA's Board of Directors named John Duhamel as the organization's next CEO. Duhamel joined CVEA in 2010 and currently holds the position of Executive Engineer. He brings more than 35 years of diverse professional experience in various leadership roles to CVEA. John is a retired United States Air Force Lieutenant Colonel, veteran of the Gulf War and holds an Engineering degree from the Air Force Academy and masters degrees in Public and Business Administration.

Regional Planning

As you would expect, CVEA has participated on the Copper Basin Regional Energy Planning Committee since its inception. The committee is a group of community partners who meet to discuss energy solutions for the area. CVEA has been a key player in this group because of the many energy initiatives studied, planned and implemented by the Co-op. Some of these energy projects include the installation of a higher efficiency generator in the Glennallen Diesel Plant; installation of a higher efficiency runner at the Solomon Gulch Hydroelectric Plant; study of biomass, wind and solar; study of the Tiekell River drainage; study of Silver Lake; and the construction of the Allison Creek Hydroelectric Plant.

The committee has now embarked on updating the 2010 Regional Energy Plan for 2015. CVEA is, again, an integral part of that effort. The new Regional Energy Plan is exploring possible intertie projects, natural gas and other renewable energy possibilities. Despite the local enthusiasm with such projects, these initiatives are complex and expensive. In today's regulatory climate, the obstacles are often too onerous to overcome. CVEA will continue to participate in developing energy solutions for the Copper Basin and Valdez Districts.

Interconnecting the Copper Valley to the Railbelt

The idea of tying the CVEA electric system into the Railbelt transmission grid has been around a long time. In 1989 the Northeast Intertie, which would connect Anchorage and Fairbanks with a 230 kV line running along the Richardson and Glenn Highways and through Glennallen, was studied.

In the early to mid 1990s the Copper Valley Intertie, a 138 kV line connecting Glennallen into the Railbelt system near Wasilla, was studied at some depth. Following five years of concentrated effort, and no small amount of money expended, the project was determined to not be economically or politically feasible for the members of CVEA.

In recent years, with renewed effort to evaluate a major hydroelectric project on the Susitna River, CVEA has once again been putting forth the idea of connecting the Copper Basin region into the Railbelt electric grid. According to Robert Wilkinson, it makes no sense to spend billions of dollars on a large hydroelectric project without connecting new transmission to the resource. One such connection could be an intertie to the Copper River Basin.

In the larger picture, a second electrical path between Anchorage and Fairbanks could have enormous benefits for the Railbelt including reliability improvements resulting from a second path to move energy between the state's two largest cities, and economic development opportunities could be realized along the route of the new transmission corridor such as developing mineral prospects or biomass resources. One example to serve new loads would be connecting the Valdez Marine Terminal (TAPS) which currently generates its own power.

Other benefits could be to facilitate the development of regional energy assets like Tielke River Hydro, the benefits of which are stranded because there exists no market for its energy. Finally, such a project would provide rate relief to the communities and residents of eastern Alaska and Prince William Sound.

According to Wilkinson, the fact is that CVEA does not have the political or economic resources to develop an intertie project on its own. That said, if the project is compelling to those potential stakeholders who do, it might be possible to get the project on the state's radar.

In 2014 the Legislature passed Senate Bill 138, the north slope gas line bill. Among other things the bill includes a provision to set aside 20 percent of royalty income, worth an estimated \$180 million a year, for local or regional energy infrastructure for areas without direct access to the pipeline. AEA has been directed to prepare a rural infrastructure development plan, including transportation projects like interties, to the Legislature by January 1, 2017. CVEA will keep a sharp eye on this potential opportunity.

Legislative Matters

CVEA has had some legislative successes over the years. In recent years appropriations for the Allison Creek Project are funding 47 percent of the estimated cost of the project, which helps ensure that diversifying CVEA's generation resources produces long term benefits for CVEA members. We are proud of that accomplishment and thank the many Legislators who helped CVEA secure that funding.

In 2015 the outlook for state appropriations is pretty dismal. There are however, other legislative initiatives that we are closely watching. In particular, a few entities that want to develop for-profit independent power projects (IPPs) are seeking preferential regulations and legislation that would grant special privileges to for profit companies and impose additional costs on electric cooperative members. This is part of a concerted effort by a few would-be IPPs to force electric cooperatives to enter into long-term contracts to purchase energy from IPPs under prices, terms, and conditions that ultimately impose higher rates on cooperative members.

CVEA's first priority in evaluating every potential energy project (whether owned by CVEA or an IPP) is its impact on member electric rates. We support renewable energy, as evidenced by our commitment to hydro, by the number of renewable energy technologies we have carefully evaluated and by CVEA's net metering program. In addition, CVEA is willing to purchase energy from qualified IPPs under prices, terms, and conditions that benefit, not harm, our members. In fact, CVEA has detailed Board-approved tariff provisions that specifically address CVEA purchases from qualified IPPs. That said, we remain concerned about regulatory and legislative initiatives that seek unfair economic preferences for IPP owners through imposing cost and rate increases on cooperatives and their members.

CVEA will closely follow these initiatives and will keep you informed as appropriate.

Commitment to Community

CVEA has a strong commitment to the communities where our members work and live, and the Co-op demonstrates this practice year round, contributing to the community in countless ways.

Each year your Cooperative supports many community groups and events. Gifts, door prizes, and auction items are donated for various events and several annual meetings throughout the year, the Co-op supports many educational and youth programs, and each holiday provides energy credits or toys for baskets given to families in need. CVEA employees participate in community events and parades and serve on many community work groups, task forces, and committees, providing community support and leadership. During Cooperative Month each year, employees volunteer their time to process paper and cans at the Recycling Our Area's Resources (ROAR) center in the Copper Valley, and coordinate a Halloween trick-or-treat event in both districts.

To further CVEA's commitment to community, the CVEA Community Foundation (CVEACF) was created in 2006, with a mission to provide scholarships for students and contributions to educational, scientific, and charitable organizations within our communities. The Foundation is funded by capital credits that have escheated back to CVEA, generous donations from CVEA members and vendors, and fundraisers throughout the year.

Each year the CVEACF awards thousands of dollars in scholarships to graduating high school seniors, adults attending Prince William Sound Community College,

and to students to participate in the Foundation's Youth Leadership program; including the Idaho Youth Rally and the National Rural Electric Cooperative Association Youth Leadership Council.

In 2014, the Board of Directors determined a restructuring of the Board was necessary; it is now made up of the same eight Directors that serve on the CVEA Board.

The Board's duties are limited in scope: approving the annual budget, approving the annual scholarship program and non-profit contributions, and selecting the Scholarship Committees.

The Foundation's program of work will now be completed by a volunteer group of interested CVEA employees, directors, and members. This working committee will focus on maximum inclusion and be given latitude to carry out the work plan of the Foundation. It will be casual in nature, with limited meetings and administrative responsibility. Working together we can do more for the communities we live in. If you are interested in serving on the Foundation Working Committee or participating in activities or events, please contact your local office.

In 2013, the Foundation changed the way contributions are made to local non-profit organizations. It now holds a Contribution Season, once a year, between July and the end of August. Local non-profits seeking funding to start new programs or to expand existing programs are encouraged to review the Contribution Guidelines and submit funding requests within this timeline.

In the last three years, the Foundation has donated just under \$14,000 to fund important programs for nine local non-profits including: the Valdez LEGO Robotics Club, KCHU, the Valdez Food Bank, Valdez Torpedos Swim Club, Valdez Imagination Library, the Copper Basin Child Advocacy Center, the Copper Valley Community Library, the Francis Kibble Kenny Lake Library, and the Wrangell Institute for Science and the Environment.

The Foundation is a 501(c)3 charitable organization under the Internal Revenue Code. Donations made to the Foundation may be tax deductible.

If you would like to make a donation to the Foundation, there are several easy ways to do so; you can make a one-time donation by cash, check, or debit/credit card, make a monthly donation by adding a specific amount to your CVEA electric bill, and even donate future capital credit disbursements. One of the easiest ways to make a contribution is to round-up your electric bill to the nearest dollar each month. Please visit cvea.org or stop by your local office for details or to make a donation.





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