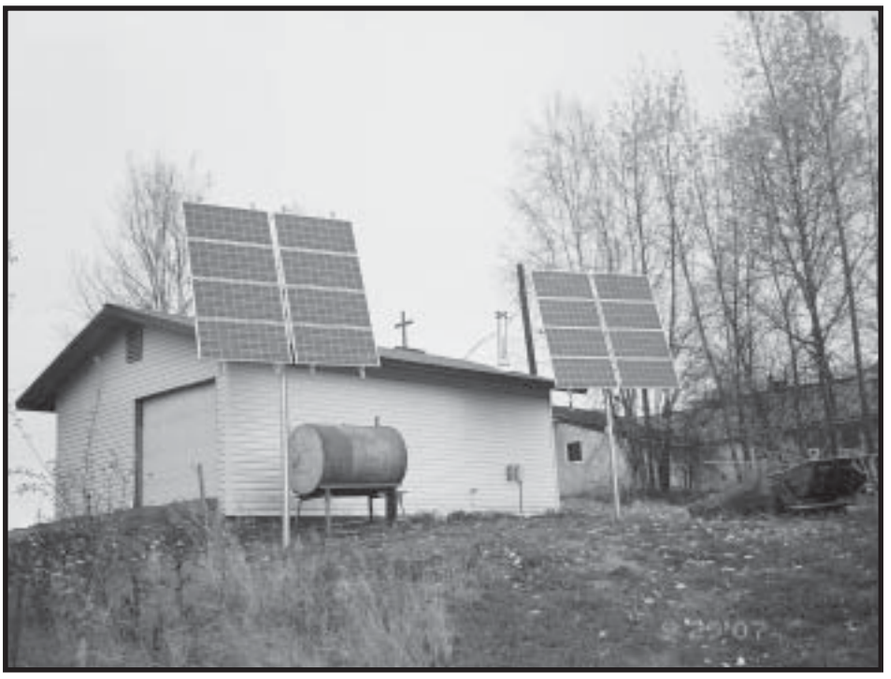
The Alaskan Shepherd

Volume 46 Number 2 **March 2008**

Some give by going to the Missions *Some go by giving to the Missions* *Without both there are no Missions*

ST. PETER IN CHAINS CHURCH IN RUBY, ALASKA, MOUNTS SOLAR ELECTRIC PANELS

Editor's Note: In our annual appeal Bishop Kettler writes, *"Northern Alaska is a land of great distances and extreme weather conditions. Prices are unbelievably high and expenses great. It is a principle in this missionary diocese that every parish, mission, program, and project be self-helping, as self-supporting as possible. Yet even with the best of efforts and good will on the part of all, we are still far from realizing this ideal. That is why, in the meanwhile, we have to turn to kind people like you to help us keep the Fathers, the Brothers, the Sisters, the lay ministers on the trail."* The following article submitted by Deacon Paul V. Perreault, P.E., our Diocesan Engineer, presents a wonderful example of how one of our remote parishes is making an effort to be self-supporting. Photos are courtesy of Deacon Perreault. —Patty Walter



St. Peter in Chains Church, in Ruby, Alaska, 240 miles west of Fairbanks, displays two arrays of solar electric panels--keeping the solar profile low, easy to install, and easy to clean.

"Have you seen your electric meter stopped?" I asked Fr. Joe Hemmer, O.S.F., the pastor of St. Peter in Chains Parish, Ruby, Alaska. "Yeah. It's probably stopped right now," Fr. Hemmer replies. It's October. Thin clouds are overhead. The sun is up, but not brightly. Still, the solar electric panels are doing their job; namely, providing the electricity needed for this small rural church. On the south bank of the Yukon River, about 240 miles west of Fairbanks, renewable sun-energy is at work.

In May 2007, the Vatican announced that in order to conserve Earth's resources, they would be installing solar panels on some buildings in "a comprehensive energy project that will pay for itself in a few years."

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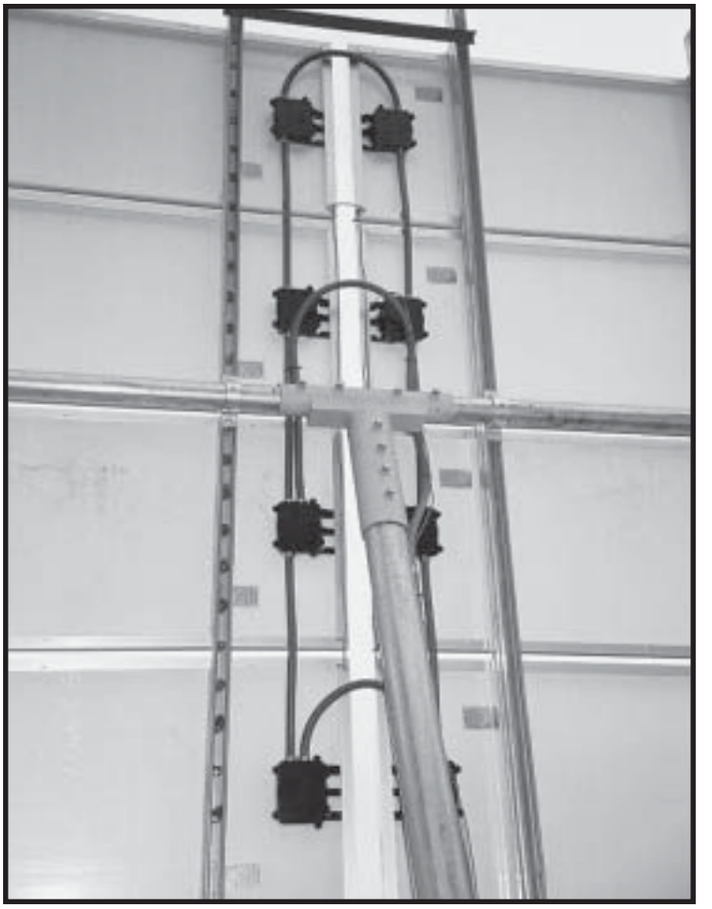
Earlier, in June 2005, a remodeled and enlarged St. Peter in Chains Church was dedicated to meet the needs of a growing parish. Now sized for about 100 people, the 2,700 square-foot church and residence needs about 400 kilowatts (KW) of electricity per month. Ruby is not connected by road to any other community.

In September 2007, St. Peter in Chains was the first parish in the Fairbanks diocese to install renewable electric energy using solar panels. Ruby City generates its own electricity using diesel generators. The Ruby electric costs are about $0.95 per KW. Together, Fr. Hemmer and the Ruby electric utility recognized the benefits to the City and to the parish by installing solar panels to generate renewable energy.

Ruby Electric credits full value to the parish, for the electricity the solar panels produce by way of reduced electric bills. Using a "Net Metering System" the parish benefits full-value for each kilowatt of electricity generated by their solar panels. "In the U.S.A., as part of the Energy Policy Act of 2005, under Sec. 1251, all public electric utilities are now required to offer net metering on request to their customers."



Weatherproof enclosures and wiring are a "must" for arctic conditions; and are standard with these Kyocera KC-130 polycrystalline silica panels.

Using a grid-intertie system, 16 solar panels have been sized to provide the average electrical needs for the parish, on a yearly basis. During summer months, the solar panels produce more electricity than is needed. The surplus electricity, not needed by the parish, is returned to the electric utility grid. The amount returned is credited to the parish to reduce the electric costs over the year. In winter, less solar electricity is produced than the church needs. Now, the church may take advantage of the surplus energy that was produced earlier.

"Grid-tie systems are inherently simpler than either grid-tie with battery back-up or stand-alone systems. In fact, other than safety disconnects, mounting structures and wiring, a grid-tie system is just solar modules and a grid-tie inverter!" answers Affordable Solar. *(www.affordable-solar.com/solar.starter.faqs.htm)*

Sun, solar panels, electrical disconnects, an inverter, and connection back into the electric utility provider's grid are straight-forward elements. Each feature is included within the data, design, construction, and maintenance of the solar array.

Yes, you need sunlight. Sure, northern latitude and clouds take away from the amount of sun. And, the effect is averaged-out in what is called a solar day. A solar day represents how much sun is available, taking into consideration Ruby's northern

We want to thank in a special way those of you who have included the Catholic Bishop of Northern Alaska (our legal title) in your bequests and wills, and those of you who, at the time of the deaths of dear ones, have suggested that in their memory contributions be made to the Missions of Northern Alaska or to the Alaskan Shepherd Endowment Fund. A suggested wording: "I give, devise and bequeath to the Catholic Bishop of Northern Alaska, 1312 Peger Road, Fairbanks, Alaska..."

latitude as well as any poor-weather days. For a given location, solar-day values are published in design tables. At Ruby, "The average solar day is just under four sun-hours per day," reports Jim Norman, President of ABS Alaskan, Inc., 2130 Van Horn Road, Fairbanks, Alaska 99701 *(www.absak.com)*. You need solar electric panels. The number of panels is selected by determining (a) the amount of electricity to be produced, (b) the wattage that each panel will generate, (c) the 4-solar-hours per day average, and (d) allows for slight losses.

The solar panels are pointed toward the sun for maximum benefit. Ruby uses the simplest mounting method. The panels are fixed on poles. The panels do not change direction as the sun moves through the sky.

Knowing the latitude and longitude determines the best sun-orientation for the panels. To capture the most sun with the simplest fixed-mount posts, the solar panels are tipped up, 64 degrees toward the sun, at the same angle as the location's latitude. That upward-angle is measured from horizontal to the back of the solar panels.

The panels are also pointed toward solar-south, where the sun is highest in the sky. Solar south may not occur exactly at noon-time. Because of time-zones, the high point of the sun may be sometime other than noon. In Ruby, due to the time zone, solar noon is in the early afternoon. The panels are also located where they are exposed to the best sunlight. In Ruby, this is just south of the church's garage, nearby.

Kyocera KC-130 electric solar-panels with polycrystalline silica structure were chosen for Ruby. The KC-130 panels report a 16% solar energy efficiency (up from other older 14% panels). "I call it [The KC- 130] 'my Alaskan solar panel'," reports Jim Norman, "There's virtually no maintenance involved." Tempered glass is laminated directly to the back panel. Jim continues, "I have yet to see the glass come off. . . And, I have seen some pretty damaged panels." Here, the 16 panels combine to produce a nominal 2,080 Watts, which after minor system losses, yields about 1,872 usable Watts.

Each panel is double circuited. The panel is extremely durable. "I really like the weather-proof electrical junction boxes with removable wire capability," Jim goes on, "It is very, very difficult for anything to damage this system." Rocks thrown by children are likely to just bounce off. Even if the panel gets severely damaged, the double-circuitry often continues to provide the electric without having to change the panel.

Careful grounding, bonding, and circuit protection are also needed. For the non-professional, the protection comes from employing knowledgeable system-installers. There are disconnects and circuit breakers both (a) for the

Father Joseph Hemmer, O.F.M., checks the Xantrex GT 2.8 inverter by simply tapping below the digital display.

direct current (DC) electric, and (b) for the alternating current (AC) electric. The solar panel electric must disconnect automatically from the utility grid if the grid-power is shut off. Electrical workers, working on the power lines, must be protected not just from electricity from in the power plant. They need to protected also from the power being fed back into the electric grid from the solar panels. These protective measures may be easy or complex are also quite serious; and are best left to the technicians.

The inverter is one of the main components for the system. In one electrical device, (a) variable DC voltage from the solar panel array is 'cleaned up' to a more uniform DC voltage, which is then (b) inverted into a full sine-wave AC voltage, that is (c) synchronized to the phasing of the electric utilities grid.

For Ruby, the solar panel array produces 270 volts DC current and is protected by a 15-amp circuit breaker. The DC current is changed to 240 Volts AC current using a Xantrex Grid Tie Solar Inverter, Model GT 2.8.

The connection back to the electric utility is simply via a dedicated circuit breaker within the AC electric panel. Utility providers that use digital electric meters may select two electric meters: one for measuring incoming power to the facility, and a second for the power going back to the utility. Here in Ruby, there is one analog meter. The analog meter allows the visual display to turn backward as electricity from the solar panels is returned to the electric utility.

Does it cost a lot? Well, that depends. What will you get back for it? The round-numbers for Ruby is that the entire system costs about $25,000, including materials, freight, and full installation. And, the system is expected to return about $2,500 per year. Simply stated, the system should take about 10 years to pay for itself - including interest.

Frankly, with this writing, our diocese is seeking grant-funds to help defray part of the initial cost already paid by St. Peter's parish.

Recall that St. Peter's is a missionary parish. Yet, they recognized the benefits of choosing renewable energy. St. Peter's took considerable initiative. They paid for the entire solar array system — out of their own finances — without asking for any financial assistance from the diocese. Even now, it is the diocese that is asking for grant funds to return to the parish. We greatly appreciate,

A view from the windows of St. Peter in Chains Church in the month of June. Houses flank the bank of the mighty Yukon river. The vast river is a source of nourishment, recreation and travel for the people of Ruby.

Photo by Tom Gollwitzer

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Dear Bishop Kettler:

As a member of the Alaskan Shepherd ***"Buck-A-Month Club"*** I enclose my contribution of $_____*OR* I have already contributed but please accept this additional donation of $_____to be used where most needed.

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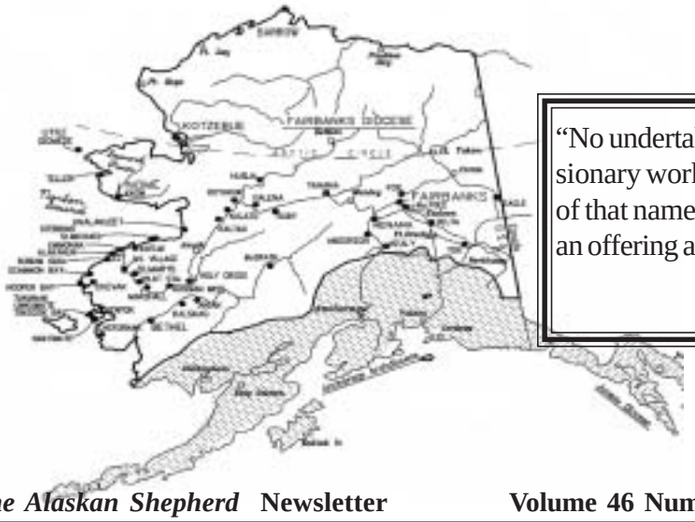
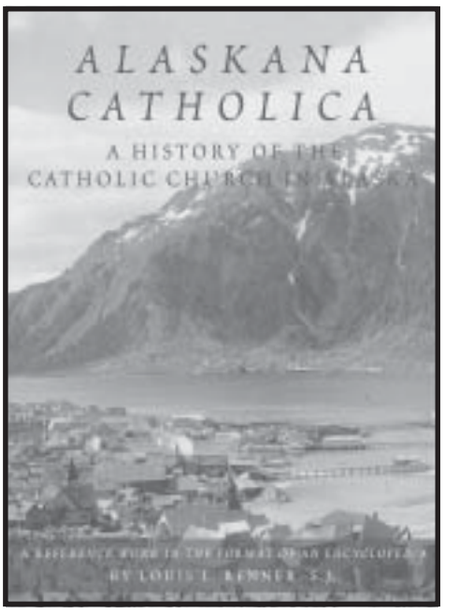


"No undertaking, perhaps, is so pleasing to God as supporting the Missionary work of the Church. All who are reckoned Christians or boast of that name must contribute their support either by their prayers or by an offering according to their means."

--Blessed Pope John XXIII

ALASKANA CATHOLICA



"Through years of dedicated research, writing, and documentation, Father Renner has created a succinct yet comprehensive guide detailing in total clarity and conciseness the history of the Catholic Church in Alaska. Within this historic documentation the reader can reference over 225 years of Catholicism in Alaska. Father Louis L. Renner, S.J., has accomplished in Alaskana Catholica a momentous feat—a magnum opus."

Donald J. Kettler
Bishop of Fairbanks

"Father Renner is the foremost authority on Catholic history in Alaska, writing history at its purest, almost exclusively from archival sources."

Dr. Dorothy Jean Ray
Historian and Anthropologist

"This fascinating volume offers an intimate picture of the activities of the Catholic Church's Alaska Mission, from its beginning in the nineteenth century to the present. It is a fact-filled account of people and places with a wonderful array of characters…Father Renner, with a historian's concern for the facts and a writer's eye for a good story, has produced a valuable work."

Francis Paul Prucha, S.J.,
Professor of History Emeritus , Marquette University

"One of the main intents of this volume," we read in the author's Preface, ***"is to keep alive for posterity the memory of many major Catholic Alaskan figures—clerical and lay, Native and non-Native, living and deceased—by the recording of their lives and deeds."***

Alaskana Catholica ("a unique gift, whether to give or to receive") is a reference work in the format of an encyclopedia. It offers its readers something more than mere bare-bones reference data and Who's Who-s. Moreover, some entries have a story about the given entry's subject attached to them. Some have a "tapestry" woven out of a series of quotations from the mission diary of the given place attached to them. These stories and tapestries give readers a kind of "you are there" experience, of being present at an event of the past or at a place remote to them.

Close to 400 images illustrate ***Alaskana Catholica.***

Yes, please send _____copy(ies) of ***Alaskana Catholica, written by Father Louis L. Renner, S.J.***

I am enclosing $85.00 for each book, which includes shipping.

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Bishop Donald J. Kettler poses with Father Joseph Hemmer, O.F.M., in the interior of St. Peter in Chains Church, on the occasion of its dedication on June 12, 2005.
Photo by Patty Walter

back or credit you will be getting for the renewable energy electricity you produce. No, you're probably not done yet. Yes, you should expect to refine the system design to optimize the benefits you expect for the investment.

Here in Ruby, the City has been especially suportive, collaborating with the parish to use one analog meter. Ruby Electric clearly demonstrates a proactive stance on energy conservation and carbon emissions reduction that was particularly helpful to the project. The rural electric utility wins when a utility consumer generates their own renewable energy. Consider the finite limits of

and wish to help support the forward-thinking initiative that Fr. Joe Hemmer, O.S.F., St. Peter in Chains parish, and Ruby Electric Company has demonstrated.

For the 'for-profit' commercial user, there are substantial tax credits and tax depreciation alternatives that may be available. For St. Peter's parish, we are asking for your help.

What's next if should you decide you want to hook up to solar panels (or other renewable energy systems like wind generators, or water generators)?

The first thing is to determine your electric use, and how much electric you would like to produce with renewable energy. Next, pick the inverter size that's big enough to provide the electricity. Third, tailor the solar panel array to fit the needs of the specific inverter. Now, check costs and benefits.

Make sure your utility provider is willing to comply with the "Net Metering System" included in the Energy Policy Act of 2005. Know the pay-

RUBY

An excerpt from Alaskana Catholica
by Father Louis L. Renner, S.J.

Ruby, "The Gem of the Yukon," located on the left bank of the Yukon River, began as a white man's gold-rush community, when gold was discovered on Ruby Creek, close to the site of the present-day Ruby, in 1907. But a town did not develop until 1911, when gold was discovered on nearby Long Creek and a stampede followed. Soon the community numbered over a thousand. A Ruby post office was established in 1912. By 1920, however, Ruby's population was down to 128. In 1939, it had 138 inhabitants; in 1950, 132; in 1960, 179; in 1970, 147; in 1980, 197; and in the year 2000, 188. During the time of the gold-rush boom, Koyukon Athabaskan Indians began to move from Kokrines to Ruby. Since shortly after the boom, Ruby's population has consisted largely of Native people.

According to the Ruby diary, Father Hormisdas Ferron, S.J., offered the first Mass ever celebrated in Ruby in the home of Mr. Henry Lovely in August 1912. In September of that year, Father Ferron baptized the first boy born in Ruby, Thomas H. De Vane. The following month, he bought a lot with a one-story frame building on it. This he adapted for use as a church and priest's quarters. The church was placed under the patronage of St. Peter the Apostle. In more recent years, the church has been known as "St. Peter-in-Chains."

diesel-powered electric generation. As the community grows, additional electric production is needed. If the equipment is aging, then this added electricity load could easily represent the need to buy additional equipment. Not just new equipment may be needed, but also increased fuel-oil quantity is needed. (Toksook Bay, elsewhere in the Fairbanks diocese, recently reported the diesel heating oil price as $5.80 per gallon.) Consumer produced electric from renewable resources may allow the utility company to defer a portion of these expenses. With renewable energy in use multiple groups win. Consumers are less dependent on fossil fuels and fewer carbon emissions are produced. That's good for the United States, the community of Ruby, Ruby Electric, and St. Peter in Chains parish. Literally, St. Peter in Chains Parish, Ruby, Alaska, expects to practically zero-out its annual electric costs over the years. Allowing this renewable energy resource to work, "is as stable and steady as the light meter," concludes Fr. Joe Hemmer, O.S.F. Kudos and compliments Fr. Hemmer, St. Peter in Chains and Ruby Electric. Good job!

Photo courtesy of David Schienle/ CBNA archives.

--Deacon Paul V. Perreault, PE

After serving in Vietnam, Paul V. Perreault, as a chief warrant officer in the U.S. Army, flew CH-54 Sky Crane helicopters in Germany. As a Professional Engineer, he has designed and seen to the building of numerous new churches in the villages of northern Alaska. As an ordained deacon, he has, since 1986, assisted and preached at Masses, first in Sacred Heart Cathedral, Fairbanks, then, in subsequent years, at St. Mark's University Parish at the University of Alaska-Fairbanks, and at St. Theresa's parish in Nenana.

Deacon Paul, in 1983 resumed his studies (having previously studied Aerospace Engineering at the University of Washington) in Engineering at the University of Alaska-Fairbanks. In the course of those studies, he was admitted to two engineering honor societies. In June 1987, he graduated with his degree, and was recognized as the outstanding civil engineering student. In January 1993, he earned a Professional Engineering registration; and, by the end of that same year, he completed his Master of Science degree in Civil Engineering, specializing in structural and arctic engineering. He was now Deacon Paul V. Perreault, M.S.C.E., P.E., employed full time, working for private contractors, the City of Fairbanks, and for a private consulting firm. As such, he was gaining valuable hands-on experience in the many-faceted field of engineering. In 2003, he was accepted by the University of Alaska-Fairbanks as a doctoral candidate. The studying of arctic foundations is his specialty.

Before 1994, he had been following two separate trails at the same time: one as a deacon, the other as an engineer. But now, a kindly Providence so disposed matters that the two trails merged into one. The Catholic Diocese of Northern Alaska had design needs. Some of its engineering projects came to the private consulting firm for which Deacon Paul was working at the time. He recognized that, being both a deacon and a professional engineer, he could do the work directly for the Church at substantial cost savings. He developed a proposed job description. This proved to be mutually acceptable. On July 1, 1994, he began working part-time as Diocesan Engineer for the Diocese of Fairbanks. With the recognized value of these services, the position soon gained full-time status.

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