2004 Report to GVEA Board of Directors on Green Power

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Executive Summary

Within the Golden Valley Electric Association membership, there exists an active interest in developing renewable energy resources, or green power, for the benefit of the association, members, and the environment.

Renewable energy, or green power, is a term used to describe electricity produced by environmentally friendly sources, which are naturally replenished and less harmful to the environment than fossil fuels. Green power is generally regarded as energy derived from sources such as wind power, solar, geothermal, biomass, and small hydroelectric, however, there is no universally accepted definition of green power.

In February 2003, GVEA received the results of the "Member Satisfaction and Green Interest Survey[1]." The survey indicated strong member interest in green power, specifically because of the positive environmental effect of renewable energy and as a resource in planning the future energy generation needs for GVEA. The survey also showed that an overwhelming majority of members supported membership-wide investment in sharing any costs for developing green power and believed that a robust education campaign from the co-op would be significant in improving the GVEA membership's understanding of green power issues.

In April of 2003, during the GVEA annual meeting, the membership passed an advisory resolution asking the Board of Directors to consider creating a committee made up of GVEA members to advise the utility on green power issues. That task was assigned to the Alternative Energy Team (AET), an internal committee within GVEA.

A group of interested stakeholder-members, named the Green Power Advisory Committee (GPAC), was assembled and asked to provide input for GVEA to incorporate into its planning process for developing any green power program. The group held its first meeting on October 15, 2003.

The stated purpose of the meetings was to identify options, issues, and particular concepts related to industrial-sized green power alternatives and to provide recommendations regarding green power issues to the GVEA Board of Directors. To help educate the GPAC, the GVEA staff prepared presentations on a variety of electric–related topics.

The GPAC was asked to consider the following: (1) a green power pricing program that would be acceptable and most likely to gain acceptance among members; (2) green power alternatives; (3) a public education plan to broaden the understanding of green power; and (4) a marketing plan to increase the purchasing market for green power.

GPAC members raised an even larger number of expectations, issues, and concerns beyond the scope of what was originally considered. The GPAC members expressed the desire that a green power plan should be economically viable and sound, should be far reaching and far thinking into the future, and should be structured in broader economic analysis than is traditionally customary in the electric industry. Specifically, this meant

[1] GVEA's 2003 "Member Satisfaction & Green Interest Survey," prepared by National Rural Electric Cooperative Association, Market Research division, project manager, Carol Martin.

that developing green power should be measured in terms integrating a "true-cost pricing" and "cost-benefit analysis" into the traditionally limited business equation of financial feasibility.

The GPAC members want to achieve "buy-in" from the GVEA Board through its process. They desire to see leadership from GVEA and a true commitment toward green power. They want to see GVEA emerge, and be viewed, as a leader in renewable energy for Alaska.

After the initial meetings, a list of 13 topics related to green power issues was considered for inquiry[2]. That list was reduced to five priorities upon which the GPAC and AET members then focused their efforts. The priorities were:

- Renewable Energy Pledge
- Wind Power Generation
- Enhanced Energy Efficiency & Conservation
- Small Scale Renewable Generation
- Funding Options

Two important actions were recommended for each issue area:

1. Educate the general GVEA membership on green power issues and benefits
2. Develop a marketing approach to better promote green power

The meetings resulted in the following recommendations:

Renewable Energy Pledge

- Adopt the "Renewable Energy Pledge" (REP) goal that 10 percent of gross capacity be attributed to green power (renewable energy) resources by the year 2014, with the larger goal being that an average of 1 percent per year up to 50% by 2050 be attributed to green power resources
- Support and fund an educational and marketing program concerning and promoting the REP as soon as possible to improve the understanding and enthusiasm for the green power vision

Wind Power Generation

- Pursue the use of wind turbines to generate electric power
- Cooperate with other Railbelt utilities to develop and complete a project, such as the proposed Fire Island wind generation facility in South Central Alaska

[2] Refer to section on "List of Original Major Green Power Topics" in this report.

- Investigate the use of advanced energy storage technologies, and the use of existing and low-impact hydropower to allow the Interior region to maximize the efficient use of the wind energy resources

Enhanced Energy Efficiency & Conservation

- Build upon and enhance the Energy*$ense* programs already in place
- Develop new strategies to meet the objectives of GVEA's energy efficiency and conservation efforts such as creating an energy efficient appliances program, promoting ENERGY STAR products, offering load management technology, and installing smart meters

Small Scale Renewable Generation

- Using the "Sustainable Natural Alternative Plan" (SNAP) program operated in Chelan County, Washington as a guide, and develop a program to encourage the installation of privately-owned and operated, small-scale, green power systems
- Establish a participation goal for the program

Funding Recommendations for large scale projects

- Adopt a systems benefits charge to fund near and long term green power programs
- Other options include:

    1) Capital credit contributions

    2) Grants and third party funding sources

    3) Voluntary green tariff

Education

- For each priority topic, provide a clear educational message to enhance the general GVEA membership's understanding and explain the benefits of using and developing green power, including an analysis of the long-term societal benefits of green power

Marketing

- Create a viable, understandable, and appealing green power education campaign
- Utilize a multitude of communication methods and outlets to better educate the GVEA membership on green power issues
- Utilize internal communication channels to enhance the understanding by all GVEA employees of green power issues and build internal support and enthusiasm at all levels of the co-op
- Adequately fund a sustained level of marketing that positively impacts green power awareness throughout the community

Implementation

- Explore the possibilities and potentials of jointly working with other railbelt utilities in developing cooperative renewable energy projects which may increase economic efficiencies
- Schedule a regular review and assessment of the "2004 Report to GVEA Board of Directors on Green Power" recommendations and annually provide an updated report to the membership on status and progress
- Authorize the continuation of the Green Power Advisory Committee to prepare an annual report to the Board of Directors

Background and Objective

The term "green power" generally refers to electricity supplied in whole or in part from renewable energy sources, such as wind, solar or hydropower. More than one-third of all U.S. consumers now have an option to purchase some type of green power product from either their utility provider or in competitive markets.

In 1998, several employees of Golden Valley Electric Association formed the Alternative Energy and Distributed Generation (AEDG) committee in response to growing internal interest within GVEA, expanding member interest, emerging and promising renewable energy and distributed generation technologies, escalating indications of a deregulated industry future, and new federal mandates. The AEDG later renamed itself the Alternative Energy Team (AET). The AET met several times a year in an effort to plan for the probable inclusion of alternative energy resources and distributed power generation into the GVEA system at some time in the future. The activities of the AET primarily included knowledge-building, networking with experienced industry and government advocates, planners and implementers, and preliminary surveying of potential renewable energy resources.

In the winter of 2002-2003, GVEA surveyed its membership attitudes concerning green power (or renewable energy)[3] and discovered the highest level of support for "electric utilities need to plan now for when non-renewable sources start running out" and "GVEA needs to invest in developing alternative energy sources now to ensure long-term electric reliability." More than 80% of the membership somewhat or strongly agreed with those statements. Traditionally, renewable energy development has been limited by the willingness of regulated utilities to invest in these resources on behalf of all customers. However, in survey after survey on the national level, consumers have expressed a preference for cleaner energy and a willingness to pay more, if necessary, for these sources.

Members of GVEA are very concerned about non-renewable energy sources running out and the need to focus on alternative and additional methods to generate electricity for the future. They feel that it is important for electricity to come from environmentally sound and cleaner sources. However, the GVEA survey found some misperceptions concerning the availability and cost of green power and what constituted green power.

Samplings of a few of the survey findings include the following:

- 39% of the members believe that green power generation is more expensive and that green power is still in the developmental stage and not readily available.
- 85% of the members perceive wind power and solar power to be "green" energy sources, 11% perceived nuclear power to be green, and 27% were not sure if nuclear power was or was not green.
- 75% of the members feel that everyone should pay evenly for any investment costs that are incurred to develop green power energy in their area.

[3] GVEA's 2003 "Member Satisfaction & Green Interest Survey," prepared by National Rural Electric Cooperative Association, Market Research division, project manager, Carol Martin.

- 12% feel that those interested in green power should pay by themselves for this investment, 13% do not know or have no opinion.
- Older, retired members and those least satisfied with GVEA are less likely to support all members bearing the investment costs equally (the majority of all other member segments surveyed supported this view).
- Younger, more educated members with higher income levels are more likely to be willing to pay higher rates for renewable energy, which is consistent with national averages.
- GVEA members are receptive to paying higher rates for electricity generated from renewable/green energy sources. 41% are willing to pay an increase of 10% or more on current rates. 25% are willing to pay something extra, but less than 10% or more on current rates.
- 30% either would not pay anything or do not know what they would be willing to pay.

In April of 2003, during the GVEA annual meeting, the membership passed an advisory resolution asking the board of directors to consider creating a committee made up of GVEA members that would advise the utility on green power issues. The advisory resolution suggested that the board of directors instruct the staff to organize such a committee. In May, during a regular meeting of the GVEA board of directors, staff was instructed to present alternatives and recommendations concerning the advisory resolution.

In June, the board approved staff recommendations[4] to develop a Green Power Advisory Group. This group—composed of stakeholder-members interested in GVEA offering green power options to its members—was to meet for the purpose of providing GVEA input into its planning process for developing any green power program considered and to help formulate how best to educate the public and market any green power program or programs. In the late summer and early fall of 2003, a 13-member Green Power Advisory Committee (GPAC) was selected through an "invitation of interest" process.

The stated purpose of the GPAC was to identify options, issues, and particular concepts relating to industrial-sized green power alternatives and to provide recommendations regarding these options, issues, and concepts. GPAC members were asked to focus on the utility perspective within Alaska, to consider economies of scale, possible partnerships, or joint ventures, and to consider ideas that were economically viable. GPAC was offered the services of staff members and internal resources needed to broaden its understanding and formulate informed recommendations. Staff prepared presentations on a variety of topics.

The GPAC was asked to consider four expectations that were of concern to GVEA. Those expectations were (1) a green power-pricing program that would be acceptable and most likely to gain acceptance; (2) green power alternatives; (3) a public education plan

[4] Refer to "10 June 2003 memo to Steve Haagenson regarding 'Renewable Energy (i.e., Green Power) Feasibility Study and Performance Plan'".

to broaden the understanding of green power; and (4) a marketing plan to increase the purchasing market for green power.

Meeting Process

In opening comments during the first GPAC meeting (October 15, 2003) individual GPAC members raised an even larger number of expectations, issues, and concerns beyond the scope of what the AET had originally considered. There was a question about defining "industrial-sized" power generation. Some GPAC members felt that size should be a flexible definition and open to discussion. "Industrial-sized" is hard to define. For some GPAC members, industrial-sized meant "GVEA ownership," which seemed to cap discussions.

The committee wanted to examine all available and effective sustainable technologies appropriate to arctic and high-latitude regions and explore local sources of green power. There was a need to educate members as to the value of green power and a desire for public education. Questions were raised, such as, what kinds of technology now exist, what are the thresholds for applying such technologies, what are life-time economics the cooperative assumes, what are charges to customers, what rates may apply to operating the machinery, and what is the value of any generating assets?

There was a desire from GPAC members to continue and expand GVEA's existing Energy*$ense* programs. There was a desire to discuss enhanced conservation efforts through focused awareness, member education and demand-side management.

There was also a desire to deal with the issue of net metering issues and that GVEA should not be the only "green" producer. Industrial-size capacity serves GVEA's interest, but net power serves customers indirectly below "industrial" levels. Therefore, there should also be a discussion about de-centralized distributed additional capacity. Billing and demand charges also needed to be explained.

Several GPAC members expressed the desire to "see concrete steps and measurable objectives and goals." For example, there was discussion that, "GVEA should commit to 'X' – percent of green power by 'X' year," or that "GVEA should develop a carbon accounting system," or "Specific percentages of emission reductions should be set as a goal," or "A net metering commitment should be a goal", or "'X' – percent of members should be committed by a specific time", etc. Measured goals and objectives with timelines were important to most of the GPAC members regardless of what goals and objectives were agreed upon and established.

There was a reiteration that the process should take as long as it needed to take so as not to fail. There was a consensus to not put recommendations "on the street" without being ready. Good ideas will be acceptable and stand on their own merits and good sense will be marketable. Some GPAC members expressed the need to be far-reaching and far-thinking into the future. Others wanted to work to achieve "buy-in" by the GVEA board. Many expressed that any plan must be an "economically viable and sound plan", and make "economic sense", but that such terms were subjective.

Many GPAC members said they would just like to see leadership from GVEA and a true commitment toward green power even if it was small steps that slowly pulled in the membership. They wanted GVEA to be seen as a leader in the state and to emerge from this process as a leader in renewable energy applications.

A number of informational presentations were suggested and requested by the GPAC, including presentations on demand side management (DSM), net metering, electricity systems, control and dispatching, GVEA's green power survey results, and cost-of-power determination and explanation.

During the next meeting several clarifications were given: (1) "utility-sized" projects did not necessarily mean "large-scale" and exclude small-scaled projects; (2) GVEA is not in business to make a profit—it is in business to serve members and provide electricity; (3) GVEA's mission is not to sell the maximum amount of electricity; (4) capital projects are paid for by the membership; (5) GPAC recommendations may face regulatory scrutiny and approval because GVEA is a regulated utility.

GPAC and AET members outlined a list of topics for discussion[5] and then prioritized the list and narrowed the scope of GPAC analysis to what was considered the most important. Those prioritized topics for further investigation included: (1) a renewable energy pledge; (2) wind power generation; (3) enhanced energy efficiency and conservation; (4) small-scale renewable generation; and (5) funding options. Sub-committees were created to focus on these prioritized topics and report back to the GPAC. The subcommittees met at agreed upon times and included at least one member from the AET to respond to GVEA-related policy and operations questions.

Initial funding issues for any green power project or program that GVEA may consider were further discussed including green power tariff options, forward funding or contributions, grants, voluntary and involuntary charges, the production tax credit offered by the federal government, dedication of capital credits and more. Net metering was also discussed, as well as "avoided cost" metering and "cost causer / cost payer" metering and the differences and similarities of each.

To help GPAC members understand GVEA's power planning process and how future power requirements are determined, an overview of the "integrated resource plan" (IRP) was provided. GPAC was also provided an overview of the railbelt energy needs, the amount of energy necessary to meet electric needs, the interconnectedness of railbelt utilities, and the 2003 report from the Alaska Energy Task Force[6].

Additional informational presentations were suggested and requested by the GPAC, including presentations on the demand charge within the rate structure, an analysis on the decline of the oil-fueled economy, transmission costs, wind generation basics, carbon marketing, types of green power pricing programs now in use around the United States, and an explanation of the multi-layered regulatory environment within which GVEA operates.

[5] See "List of Original Major Topics" section.

[6] Alaska Legislature's "House Concurrent Resolution No. 21 (HCR 21)" established the Alaska Energy Policy Task Force to examine how electricity is generated, transmitted and distributed in Alaska in order to meet the State's existing and future electrical needs in a safe, reliable and efficient manner.

Most of the informational presentations of the AET to the GPAC and any subcommittee report presentations to the GPAC are included in the appendix of this report.[7] Members condensed this far-ranging discussion to the topics in the following list:

List of Original Major Green Power Topics

1. Renewable Energy Pledge – "X" percentage of GVEA production from renewables by 200X. REP sets the tone for the future.
2. Build a wind farm, perhaps along the railbelt/Intertie, perhaps as a joint-venture with Chugach Electric and perhaps consider building in Windy Pass in the Alaska Range. (This could be considered the industrial-sized recommendation.)
3. Include carbon emissions accounting in current operations and in future power production planning. Consider carbon and other emissions as a cost criterion when making future decisions.
4. Conservation plan should be greatly expanded and multidimensional. Demand-side education could be included here.
5. Net metering – encourage members to produce small quantities of renewable power and sell it to the utility
6. Wind power generation in the region spanned by the central Alaskan electric grid
7. Solar generation in the same region as wind
8. Increased use of natural gas as a fuel source, in the same region
9. Generation using thermal temperature differences in the same region
10. Electric energy storage technology in the same region
11. Real time pricing and matching of load-to-resources
12. Renewable energy pipelines
13. Possible method for reducing air pollution from automobile exhaust and, at the same time, reducing automobile electric pre-heating to save electricity for GVEA (thus reducing the electric power generation needs in cold weather), which would also help reduce the carbon monoxide and ice fog in Fairbanks

Beyond the regularly scheduled GPAC/AET meetings, members also conducted a series of subcommittee meetings, which focused on the five selected prioritized topics that were agreed on as central issues, and exchanged numerous communications between one another. There were numerous emails that focused on—to list a few—the following topics: net metering; green pricing programs around the country; perspectives on energy storage systems; hybrid energy supply systems that coupled wind power with hydrogen production to support fuel cells; matching loads with resources; real time pricing; and long term perspectives on future electric power supply.

[7] Refer to list of presentations in appendix of this report.

Focused Sub-Committee Reports: The Five Selected Prioritized Topics

Renewable Energy Pledge

Throughout the lower-49 states and the world, electric utilities, states, and countries are pledging to secure a portion of their electric power from a renewable energy source. The forces driving this move towards renewable energy use in the electric portfolio include concern for the environment, economics, national security, and increasing cost-effectiveness of renewable energy technologies.

The concept that a dedicated amount of a nation's, a state's, or a utility's power be derived from a renewable energy source has been referred to as a "Renewable Portfolio Standard."

It is recommended that GVEA develop its own plan for obtaining renewable energy as a portion of its future energy portfolio. This "renewable energy pledge" (REP) that GVEA would adopt would not be a state or regulatory mandate, but rather would reflect the leadership of the board of directors and support for green power by the membership as revealed in GVEA's 2003 green power survey. The creation of GVEA's REP would serve as policy input to the Integrated Resource Plan.

GVEA documents convey the vision that a majority of the utility's power will be from renewable energy within 50 years. Inferring from such statements, a GVEA REP with a goal of an increase of 1 percent of renewable power per year, would therefore appear a reasonable goal. GVEA's REP could first be attained with demonstration-sized projects spread throughout the transmission grid in appropriately located sites, such as near Healy or Delta Junction. GVEA could also participate in joint ventures or partnerships with other utilities developing green power on a larger scale, such as Chugach Electric Association.

The GPAC urged the adoption of an immediate goal of 10% of green power generation capacity by 2014.

The adoption of GVEA's REP will provide the foundation and framework by which all GPAC recommendations on wind power generation, enhanced energy efficiency and conservation, small-scale renewable generation and funding options are planned and fostered.

Wind Power Generation

It is recommended that GVEA pursue the use of wind turbines to generate electric power. This initially involved GVEA's participation in the "True Wind" study and will include continuation of these efforts to better quantify the wind resource in Interior Alaska, as well as cooperating with the railbelt utilities that participated in the 2004 *Railbelt Energy Study*.[8] The latter may lead to the development of tens of megawatts worth of wind power in the Anchorage area. It is possible that the full development of this wind potential could result in enough megawatts being transmitted north over the Intertie that at least the southern portion of the line may have to be upgraded. Similarly, if sufficient resources exist in the Delta region, the line from Delta to Fairbanks may eventually have to be

[8] Report of Alaska Energy Policy Task Force, December 2003.

upgraded. Such issues can only be completely addressed after ongoing studies are completed. If GVEA ultimately produces wind-generated electricity from a region extending all the way from Anchorage to Delta, this geographical diversity could dampen the effects of wind fluctuations in the total wind resource.

It is recommended that GVEA investigate the use of advanced energy storage technologies to allow the Interior region to maximize use of the wind resource. GVEA should also pursue the study of low-impact hydropower to complement the wind-generated electricity. As the wind-generated electricity fluctuates, hydro-generated electricity may be well suited to quickly ramp up or down and help stabilize the overall renewable energy production.

Enhanced Energy Efficiency and Conservation

GVEA should improve upon the Energy*$ense* programs already in place and continue enhancing energy efficiency efforts as outlined in Section 7.1 of the *GVEA Administrative Manual* (last revised Dec. 16, 2002).

Highlights of Sec. 7.1 include the following:

a. Develop and maintain an effective load management program
b. Provide conservation information to the membership
c. Monitor energy use in all aspects of operations including facility operation, facility construction, and use of vehicles
d. Maintain an active employee training program

Other specific efficiency / conservation recommendations include the following:

e. Provide energy efficiency information to the membership
f. Include the GVEA motor vehicle pool
g. Increase the penetration and use of energy efficient appliances, such as horizontal axis washing machines and energy miser vending machines
h. Install smart meters, initially in businesses and ultimately in residences, as installed costs decrease.(This will at least allow “time of use” (TOU) pricing programs to be implemented, which will help stabilize demand and reduce utility operating costs.)

Enhanced energy efficiency and conservation measures should be included in the overall strategy to meet GVEA’s renewable energy pledge (REP) goals. Implementing a “system benefits charge” (SBC) to help in the funding of enhanced energy efficiency and conservation programs should be considered. Another funding source could be the United States Department of Energy.

To assist in the marketing of these measures, it is recommend that GVEA partner with entities such as the Cold Climate Housing Research Center and University of Alaska Fairbanks to monitor the successes of existing and soon-to-be adopted measures in Alaska. This information can be disseminated to members to illustrate Alaskan programs. Real time data, including calculated efficiency and economic indicators, can be made

available on the Internet. It will also be necessary to share the successes achieved with members. By communicating these examples, GVEA can both educate and market these programs.

If GVEA were to quantify how it differs from other regions in the US that are increasing the penetration of green power, then it would be better positioned to know to what extent it can adapt other programs for Interior Alaska. Important factors include differences in the interconnectedness with other utilities, electric demand profiles, coincidence of renewable resources with the thermal and electric loads, ratio of the thermal to electric loads, and heating degree days (HDD) verses cooling degree days (CDD).

Small-Scale Renewable Generation

GVEA should adopt a policy and program that encourages electrical members to invest in small-scale, grid-tied renewable energy systems. Although "net metering"[9] was the focus of the early discussions and debated at great length, the GPAC chose to endorse a program modeled after the "Sustainable Natural Alternative Plan" (SNAP) operating in Chelan County, Washington. SNAP allows the Chelan County public utility district's members to support local, small-scale green power production by contributing to a green power fund. The electric utility collects the contributions and holds the money until the year's end. At this time, each green power producer is paid a percentage of the fund based on their production. For example, if a member produced 5% of the total green power produced in a given year, that member would then receive 5% of the total green power funds collected.

The SNAP is essentially a green power commodity market managed by the electric utility. The utility does not set green power rates, but instead manages the program, collects contributions, meters the green power delivered to the grid, and distributes the green power funds collected. The financial risk of investing in green power is borne by the individual green power producers, not by the utility. Green power producers pay all costs for the purchase and installation of their renewable energy systems, including the UL-compliant "line-tie" inverter and a lockable disconnect. The SNAP is a free market approach to encourage local green power production.

SNAP is the Chelan County PUD program's acronym. An appropriate name and acronym for GVEA's plan might be one of the following:

- HARP – Homemade Alaskan Renewable Power

[9] For background and explanation purposes, net metering is a program—and a process—available in more than thirty-three states of the country that allows relatively small-sized, independent electric producers to generate electricity for individual use and infuse surplus electricity back into the electric grid. Net metering is perhaps the simplest way of connecting green power to the electrical grid. The process uses only one meter. The independent electric producer either (a) purchases electricity from the grid (as a traditional customer or member does), or (b) slows the "spinning" of the meter—and the purchase of electricity—by "mixing" traditional electricity consumed and purchased with independently-generated electricity from a self-operated, small-scale renewable generating system (e.g., a residential wind turbine), or (c) turns the meter backwards when producing a surplus of green power. This type of program allows the customer to pay for only the "net" energy used during the month. At the end of the year, if the meter shows that more power was produced than consumed, then either the utility could reimburse the small-scale independent electric producer (negotiable), or the producer could "donate" the kilowatt-hours to the utility or beneficiary.

- SANE – Sustaining Alaska with Natural Energy (SANE has been used by others)
- GEAR-UP – Green Energy Alternatives for Residential Use & Power

It may be possible that a program, or programs, could incorporate both a net metering and a SNAP-type method to encourage small-scale, renewable energy production.

Prior to pursuing members for the small-scale RE program, GPAC recommends GVEA establish a participation goal for the program, such as 5 percent of the membership. GVEA should also establish guidelines for both the lengths of commitment, and the levels of financial contributions necessary to participate in the program. Varying levels of commitment should be available, in order to facilitate interest from individuals of all income levels.

Marketing of this program should be directed at both would-be consumers and producers of renewable energy. This can be done with informational flyers (included with monthly billing statements), articles in the *Ruralite*, the GVEA web page, and GVEA's existing multimedia-based member education efforts. GVEA could host workshops to explain the requirements and benefits of becoming green power producers. Members can then be recruited through sign-up postcards distributed in monthly billing statements and through the GVEA web site.

Funding Options

The goal of the funding subcommittee was to evaluate options for funding GVEA green power projects, identify the most opportune methods, and make recommendations to the board on how to pursue the most favorable funding options.

The funding subcommittee focused efforts on funding mechanisms for large-scale green power projects (usually owned by utilities), in contrast to the efforts made by the small scale renewables subcommittee which looked at promoting small, distributed-size green generation projects (usually owned by individuals).

The "Industrial Green Power Fund" could collect monies from a system benefits charge[10], electric rate subsidies, capital credit contributions, grants, pollution mitigation contributions, and pollution fees. The fund would provide capital out of principle for the construction of green power generation plants to offset the possible higher cost of green power production. The fund would not be an endowment from which only a small percentage of cash would be distributed. Possible green power projects include wind turbine farms. They could be wholly-owned by GVEA or developed by a consortium of railbelt utilities similar to the Bradley Lake hydroelectric project.[11]

[10] A system benefits charge (SBC, also known as a public benefits charge) collects a non-bypassable fee from all electricity customers to fund public goods programs. These programs can include energy efficiency, renewables, and research and development.

[11] Refer to section on "Wind Power Generation" in this report.

Funding ideas considered and evaluated were the following:

1. Electric rate subsidies: allow GVEA members to choose to pay a higher rate for green power by either increasing their electric rate by several cents per kWh, or allowing members to purchase blocks of green power for a set price. An example of the second option is allowing members to purchase 100 kWh a month of green power for an extra $4.00 a month.
2. Capital credit contributions: allow GVEA members to donate their capital credits to the green power fund.
3. System Benefits Charge: adopt a SBC to pay for the higher operational costs of green power.
4. Grants: apply for grants (from the U.S. Dept. of Energy, for example) to support green power generation.
5. Pollution mitigation contributions: entities may be given the option of contributing to GVEA's Green Power Fund in lieu of installing pollution reduction equipment. This would be similar to "prevention of significant deterioration" (PSD) offset plans, carbon tax plans, etc., and would require a major statutory change in Alaska's law before implementation.
6. Pollution fees: entities that were found to have polluted the environment under either federal or state law could support GVEA's green power fund in lieu of fines. This would require a major statutory change in Alaska's law before implementation.
7. Tax incentives: As a non-profit, GVEA is not eligible for tax incentives, however, it might benefit from the incentives if they partnered with a private power developer.

Recommendations:

1. Adopt a system benefits charge (SBC) to offset the anticipated higher costs of a green power generation system. In the 2003 member attitudes survey, there was widespread support for the costs of green power to be borne equally by all cooperative members. This type of funding mechanism is appropriate for a cooperative electric utility.
2. In the next 1 to 5 years, in advance of new green generation being available, GVEA should consider implementing a green tariff. The green tariff could be modeled after some other utility's successful green power pricing program and be ready to sell when green power is available. In 32 states across the U.S., over 300 investor-owned, municipal, and cooperative utilities either have implemented or plan to offer green pricing programs. The majority of these utilities charge a higher per kWh rate for green power. There are also many utilities that sell kWh blocks of green power to customers.
3. In the same time frame, GVEA will determine if the existing governance allows members to "donate" capital credits to specific programs. If allowed, GVEA will poll members on their willingness to donate capital credits to a green power program, and if interest is sufficient, a program will be put in place. Each year

approximately $1 million to $2 million in GVEA capital credits become available for distribution to eligible members. If the current by-laws do not allow this donation, the GPAC committee asks the Board to change the by-laws so this type of program could be implemented.

4. GVEA should continue to look for grant opportunities to offset capital costs for new green power projects.
5. The GPAC recommends that the Board of Directors give a report at the annual meeting on the status of the funding programs.

Challenges:

1. Coordination with a SNAP-type[12] program. If the small renewables group recommends a SNAP program, we need to discuss possible conflicts between the goals of the SNAP and Green Power Fund; confusion in the minds of GVEA members between the two programs; and possible anger on the part of SNAP power producers if the Green Power Fund undercuts future donations to the SNAP program.
2. Educating GVEA membership
3. Marketing the funding mechanisms
4. Competition for green power funds

[12] Refer to section on "Small-Scale Renewable Generation" in this report.

Education

The following are some suggested education messages provided by GVEA staff:

Renewable Energy (RE) Benefits

- RE technologies are clean sources of energy.
- RE has a much lower environmental impact than conventional energy technologies which rely on fossil fuels. (Increased use of fossil fuels has significantly increased greenhouse gas emissions, particularly carbon dioxide, creating an enhanced greenhouse effect. Energy use from fossil fuels is also a primary source of air, water, and soil pollution.)
- Unlike fossil fuels, RE sources are sustainable. Other energy sources are finite.
- The majority of RE investments are spent on materials and workmanship to build and maintain the facilities, rather than on costly energy imports.
- Dollars spent on RE stay at home; short-term construction jobs and long-term operating and maintenance jobs are created, plus multiplier effect; economic growth is fostered; whole country benefits.
- RE technologies developed and built in the United States are being sold overseas, providing a reduction in the U.S. trade deficit.
- RE reduces dependency on foreign oil imports, which lessens the impacts on the national energy policy and strengthens the nation's energy security.

Renewable Energy Pledge (REP)

The REP is a concept wherein GVEA would pledge that a dedicated amount of power would be derived from a renewable energy source – such as wind power – within an acceptable and appropriate period.

The REP would set a goal that a minimum amount of renewable energy is included in the GVEA portfolio of electricity resources by increasing the amount of renewable energy over time and putting GVEA on a path toward increasing sustainability.

Wind Power Generation

By the start of 2003, the world's wind power generating capacity was over 31,000 megawatts (MW). At the end of January 2004, the U.S. had almost 6,400 MWs of installed wind energy generating capacity.

Wind farms across the country are currently generating about 10 billion kilowatt-hours (kWh) annually - enough to power one million average American homes.

As customer demand for clean energy grows and the costs associated with wind power continue to drop, utilities are expected to increase their use of this clean, reliable energy resource.[13]

[13] Source: the American Wind Energy Association.

Currently GVEA has an active wind monitoring program surveying viable wind resource areas within the Interior.

Enhanced Energy Efficiency and Conservation

GVEA already has in place an energy efficiency policy as outlined in Section 7.1 of the *GVEA Administrative Manual* (last revised Dec. 16, 2002). Highlights of Sec. 7.1 include the following:

- Developing and maintaining an effective load management program
- Providing conservation information to the membership
- Monitoring energy use in all aspects of operations including facility operation, facility construction, and use of vehicles
- Maintaining an active employee training program

As part of this policy, GVEA currently administers the Energy*$ense* programs.

EE means using less energy to accomplish the same task.

- The more efficient use of energy results in less money spent on energy by homeowners, schools, government agencies, businesses, and industries.
- With EE, the money that would have been spent on energy can instead be spent on consumer goods, education, services, and products.
- An EE economy can grow without using more energy.
- An EE economy that uses less energy also produces less pollution, because the two are closely tied.

Small-Scale Renewable Generation

Small-scale renewable energy systems could make a measurable contribution. Depending on the renewable energy resource for such a system, combined with energy efficiency, an electric bill could be lowered by 50 to 90 percent.[14]

The goal of the small-scale renewable generation is to bridge the economic gap between energy derived from small wind turbines and that generated by traditional sources.

[14] Source: "Small Wind Electric Systems," National Renewable Energy Laboratory, U.S. Department of Energy, October 2002.

Marketing

The following are some recommendations provided by GVEA staff regarding the marketing of green power:

Why have a green pricing program?

"We have to stop and consider: How much clean air do we really need?" – Lee Iacocca

Rationale for having a green power pricing program:

- Responding to member requests, satisfying members' desires, and providing members' choices
- Improving public relations – satisfying members' concerns and needs, earning public relations benefits, and satisfying regulatory bodies
- Improving environmental performance and responsibility and reinforcing environmental stewardship role
- Educating customers and utilities
- Supporting new U.S. (domestic) energy sources
- Promoting price stability (fuel prices)
- Potential business opportunity
- Increasing member loyalty and trust
- It's the right thing to do

People will pay extra for green power because they want:

- Environmental benefits, i.e., clean air
- Local power projects that create jobs and income
- Supporting development of new technologies and innovations
- Diversifying energy sources and power generation, providing a hedge against supply shortages or price spikes

Motivation factors for having a green power program:

- Protecting the environment for all children, elders, humans
- We are all responsible for the environment
- If not us, who? If not now, when?
- For the sake and survival of the planet
- Cleaner power production
- Green power renewable and cleaner
- Green power is a good investment

- Renewable energy sources are long overdue
- Renewable energy sources increase national security and independence
- Members don't want to feel guilty when they turn on the lights
- Investing and promoting green power will help create a demand for renewable energy
- Supporting green power does not cost much to help the environment

Potential green power market size

- Current median market penetration nationwide is about 1 percent. The average residential participation for customer-owned utilities (e.g. cooperatives) is about 1.7 percent (for investor-owned utilities it is about .97 percent)
- Size of utility (i.e. number of residential customers) is a significant factor
- Member ownership has a positive effect on buy-in and increasing participation

Proper design of green power marketing plan is important

- Improves response rates
- Lowers costs of targeting
- Improves decision process
- Helps to sell new ideas
- Ability to evaluate performance and measure accountability
- Improves administration and membership buy-in

The target green power market and targeting green power purchasers

According to nationwide statistics, 16.5 percent of the population are potential participants.

The typical green power buyer: Is highly educated, most likely female, active volunteer with service non-profits, active in outdoor recreation and politics, owns a home computer, shops certain mail order catalogs, characterizes herself as "environmentalist," likely never married, one-person household, gardens, recycles, first to buy new products and services, likely donator to or volunteer for environmental or other public cause, active, healthy lifestyle and buying habits, owns energy efficient appliances, lighting and HVAC equipment.

Target the educated – college/university graduate and advanced/post graduate.

Use affinity marketing and marketers-grassroots marketing, marketers, and viral strategies that are well suited to marketing green power. Target customers that have an incentive to let others know, such as businesses.

Why target the large energy users, the commercial, industrial or institutional?

- Large energy users have marquee value.
- Targeting large energy users is more cost effective than residential sales.
- Commercial, industrial or institutional can create cross-selling partnerships and build relationships.

Target large energy users that are making the environment part of their corporate message. Examples are Toyota, Kinko's, University of Alaska (i.e., the "low-hanging fruit").

Reasons the large energy users would consider purchasing green power:

- Public relations/earned media value
- Hedge against fossil fuel price volatility and escalation (portfolio diversity)
- "Catering to greens" LOHAS (Lifestyle of health and sustainability)
- Co-location/Peak shaving
- Employee morale
- Hedge against emissions regulations
- Energy efficiency/load management bundling
- Enlightened self-interest corporate recognition program

<u>Green power targeting methods, mediums</u>

Tools of marketing

- Use direct mail campaigns
- Bill inserts still # 1 way to get participants
- Use a multi-faceted approach – use many outlets, integrate and combine efforts with partners, use all opportunities, including operators and "small talk" phone interaction from all employees.
- Use kiosks in participating stores of larger buyers, cross-selling, relationship building
- Use affinity partnerships – generate cross-business relations, use discounts, and increase synergetic relations
- "Earned" media coverage is creditable, invaluable and free. Work the media for the "earned" media attention. Local media will pick up large energy users purchase agreements. Partner with businesses to generate press (earned media).
- Produce regular press releases to keep issues in front of media
- Create innovative newspaper ads
- Create innovative display posters

- Promote program for the holiday season (e.g., right before Thanksgiving, Christmas, etc.) and special dates (e.g., Earth Day, Arbor Day, etc.)
- Create promotional items
- Devote space in the websites
- Publish a special newsletter for the program
- Establish positive partnerships/relationships (commercial, industrial, institutional, agencies, educational, governments, media, etc.)
- Publish success stories
- Join other green power partners
- Offer a school curriculum
- Create environmental benefit awareness campaigns
- Annual environmental benefits/award/recognitions/statistics/measurements

Places to seek out green power purchasers:

- Public TV or radio membership rolls
- Identified retail establishments that support green power
- Identified non-profit organizations that support green power
- Shoppers of a few select mail order catalogs (affinity marketing)
- Utility specific, identified neighborhood of demographic support
- Purchasers of other energy-efficient programs, appliances, equipment, etc.
- Purchasers of a gym or fitness center membership
- Purchasers of a specialty license tag or license plate (or specific bumper stickers)
- Purchasers of season tickets for a pro sports team
- Best sectors: Companies already buying/participating somewhere else or publicly addressing the issue; universities; government; health foods/products; hospitality; retail; niche sectors/bandwagon effect
- Niche sectors – federal facilities, LEED (Leadership in Energy and Environmental Design) accreditation, ISO14001 EMS standard – GHG reduction goals; "sustainable" business; businesses motivated to rehabilitate image from "bad acts"; autos, etc.

It is vitally important to continue communicating with green power purchasers after participation to keep customers.

- Create and regularly use participants' newsletter
- Consumer education outlets
- Technology demonstrations for the public
- Regional attractions for the public

Successful green power programs

- Have senior management commitment, which is critical
- Offer programs for the right reasons
- Are creative and innovative
- Involve local environmental and conservation groups (and federal and military because of mandates)
- Invest sufficient money, staff and other resources into marketing and supporting
- Maintain high community visibility and credibility
- Make long-term commitments to increasing participants and communicating with participants
- Continue to articulate and communicate importance of program
- Take advantage of earned, or free, media
- Make program easy to do business with – not a complex program
- Communicate with participants (regular newsletters)
- Establish benchmarks for number participation, MWh sold, total percent of green power sales, establish sales cycles for largest customers
- Earn financial and marketing support from company and partners

Recommendations to the GVEA Board of Directors

The meetings resulted in the following recommendations:

Renewable Energy Pledge

- Adopt the "Renewable Energy Pledge" (REP) goal that 10 percent of gross capacity be attributed to green power (renewable energy) resources by the year 2014, with the larger goal being that an average of 1 percent per year up to 50% by 2050 be attributed to green power resources
- Support and fund an educational and marketing program concerning and promoting the REP as soon as possible to improve the understanding and enthusiasm for the green power vision

Wind Power Generation

- Pursue the use of wind turbines to generate electric power
- Cooperate with other Railbelt utilities to develop and complete a project, such as the proposed Fire Island wind generation facility in South Central Alaska
- Investigate the use of advanced energy storage technologies, and the use of existing and low-impact hydropower to allow the Interior region to maximize the efficient use of the wind energy resources;

Enhanced Energy Efficiency & Conservation

- Build upon and enhance the Energy*$ense* programs already in place
- Develop new strategies to meet the objectives of GVEA's energy efficiency and conservation efforts, such as creating an energy efficient appliances program, promoting ENERGY STAR products, offering load management technology, and installing smart meters

Small Scale Renewable Generation

- Using the "Sustainable Natural Alternative Plan" (SNAP) program operated in Chelan County, Washington as a guide, develop a program to encourage the installation of privately-owned and operated, small-scale, green power systems
- Establish a participation goal for the program

Funding Recommendations for large scale projects

- Adopt a systems benefits charge to fund near and long-term green power programs
- Other options include:

  Capital credit contributions

  Grants and third party funding sources

  Voluntary green tariff

Education

- For each priority topic, provide a clear educational message to enhance the general GVEA membership's understanding and explain the benefits of using and developing green power, including an analysis of the long term societal benefits of green power

Marketing

- Create a viable, understandable, and appealing green power education campaign
- Utilize a multitude of communication methods and outlets to better educate the GVEA membership on green power issues
- Utilize internal communication channels to enhance the understanding by all GVEA employees of green power issues and build internal support and enthusiasm at all levels of the co-op
- Adequately fund a sustained level of marketing that positively impacts green power awareness throughout the community

Implementation

- Explore the possibilities and potentials of jointly working with other railbelt utilities in developing cooperative renewable energy projects, which may increase economic efficiencies
- Schedule a regular review and assessment of the "2004 Report to GVEA Board of Directors on Green Power" recommendations and annually provide an updated report to the membership on status and progress
- Authorize the continuation of the Green Power Advisory Committee which prepares an annual report to the Board of Directors

Appendices

Green Power Advisory Committee (GPAC) & Alternative Energy Team (AET) members, sub-committees, and meeting dates:

Green Power Advisory Committee (GPAC) members

- Joe Beedle
- Scott Bell, P.E.
- Dr. Henry Cole
- Dr. John N. Davies
- Tom DeLong
- Joe Durrenberger
- Greg Egan
- Prof. Ron Johnson
- Mike Musick
- Lissa Robertson
- Dr. William Sackinger
- Kelly Hill Scanlon
- Prof. Richard Seifert

GVEA's Alternative Energy Team (AET) members

- Dan Bishop
- Dave Gardner
- Tom Hartnell
- Todd Hoener
- Kate Lamal
- Paul Morgan
- Henrik Wessel

GPAC meeting dates

- October 15, 2003
- November 24, 2003
- December 17, 2003
- January 15, 2004
- February 5, 2004
- February 19, 2004
- March 11, 2004

GPAC Subcommittees & Members

Renewable Energy Pledge

- John Davies
- Tom DeLong
- Mike Musick
- Kelly Hill Scanlon
- Tom Hartnell, staff member

Wind Power Generation

- Henry Cole
- Ron Johnson
- Kelly Hill Scanlon
- Paul Morgan, staff member

Enhanced Energy Efficiency and Conservation

- Tom DeLong
- Ron Johnson
- Mike Musick
- William Sackinger
- Todd Hoener, staff member

Small-Scale Renewable Generation

- Henry Cole
- John Davies
- Greg Egan
- Lissa Robertson
- Henrik Wessel, staff member
- Dan Bishop, staff member

Funding Options

- Joe Beedle
- Scott Bell
- Lissa Robertson
- Richard Seifert
- Kate Lamal, staff member