

# Proposal for a Million Solar Roofs

## Coalition for Alaska

A Response to Solicitation Number:  
DE-P536-01GO90001

### MILLION SOLAR ROOFS INITIATIVE SMALL GRANT PROGRAM FOR STATE AND LOCAL PARTNERSHIPS

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**Due Date: February 1, 2001**

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### Volume II Business Volume

## Technical Summary

This proposal describes the second year of our participation and the activities we propose in our National Million Solar Roofs Initiative, sponsored by the U.S. Department of Energy. It is a response to solicitation number DE-P536-01GO90001. The following proposal includes the plan of work, financial support request, personnel resumes, and letters of commitment from coalition participants. We anticipate it is a full response to this solicitation.

The State of Alaska having entered the million solar roofs coalition effort late, has had a very positive first year. Although we are only half way through it, we must at this point propose for the next year. There has been a very good response to our effort and I believe every one of our collaborators in the coalition will commit a letter of support this year as well. Although we have not entirely met our expectations for this year, it is only because of having funding since July 1 and not being able to bring planning contractors from DOE to our State to help us plan for the forthcoming years. The response in this first year however, has been extremely rewarding and consoling. For that reason, we have no hesitation in applying for a second year's work.

Our coalition members include the Cooperative Extension Service, a service mission organization at the University of Alaska Fairbanks and the focal organization of the Alaska Coalition. The businesses include ABS Alaskan, a battery and off-grid electrification sales company in Fairbanks; Specialty Electric of Homer, a source of wide range of electrical and off-grid alternative power systems, also specializing in marine electrification systems for boats. A 501C3 educational corporation, the Alaska Building Science Network, which is an educational organization with a large skill base in technical workshop delivery in the shelter industry, and has good connections with the Homebuilder's Association, the state affiliate of the National Association of Homebuilders. Two members of Golden Valley Electric Association's staff, a rural electric cooperative located in Fairbanks, are also members and have committed the local coop to membership in our Solar Coalition. And an active company, Polar Wire Incorporated, in Anchorage is a member of our coalition. Two small rural companies, one run by Kirk Garroute and the other by Jono Becker and Terry Gacke are also members. Garroute's corporation is Susitna Energy and Becker and Gacke are partners in Sub-Arctic Solar Alaska.com. Another new addition is Alaska Renewable Energy whose principal is Greg Egan.

So far our major event has been the participation in the September 2000 IEEE Photovoltaics Conference in Anchorage. We had a meeting there and participated in that conference. Rich Seifert the coalition chair gave a paper at that conference. We have had a quarterly meeting in November and have been in regular touch with Heather Mulligan, our regional DOE coordinator for the Million Solar Roofs Coalitions. Heather also attended our full photovoltaic workshop day in Anchorage on 18<sup>th</sup> September 2000 and met with our coalition the evening before at the Anchorage Hilton Hotel.

Last year's proposal included a series of methods and goals we foresee using in our Million Solar Roofs outreach effort. We continue to use the media of teleconferencing and e-mail for educational outreach, incorporating the extension model. This works especially well for our state. This month (January) we are going to release a PV solar comparative cost benefit paper comparing it to diesel and wind electrification in rural Alaska. This is a preliminary attempt to do what we promised to do last year. Also, Seifert attended the Seattle (12<sup>th</sup> September) Solar financing course sponsored by US DOE and brought back copies of the Financing CD to members of the Coalition. Greg Egan attended the Midwest Renewable Energy Fair in Madison, Wisconsin and ASES Solar 2000, June 2000.

We are going to continue our efforts in finding ways to encourage early adopters at the residential and village scale in Alaska and in utilizing experience shared in the other Coalitions by bringing contractors to help us plan and organize our efforts more along the lines of learning from other coalitions around the country. Our goals for the coming year are again modest but their achievement is crucial if we are to participate in the national agenda with competence. We feel we can meet the major activity objectives. We are particularly interested in finding out if we can develop a net metering protocol for working with our utilities in the state.

### **Project Benefits from DOE Funding**

Clearly this whole process would not be happening without DOE funding, and it is absolutely essential for us to continue our efforts. We believe that we can continue to gain credibility and attention for renewable energy efforts in Alaska, a state which is in dire need of this kind of legitimacy and credibility. We continue to adapt and utilize electronic media and communications networks in the extension model and we are going to publish our comparative PV paper in the Cooperative Extension Service newsletter, Alaska Building Science News, as a means of maximizing the public information outreach and raising awareness of this new coalition. Several articles have been included in this publication over the past year, including a major announcement of the PV workshop in September in our autumn newsletter and an announcement of the coalition's funding in the Summer newsletter. We also advertised the IEEE Photovoltaics Conference extensively in the newsletter.

The primary responsibility for this Coalition will be with the proposer, Professor Richard D. Seifert, Energy and Housing Specialist with Cooperative Extension Service, a unit within the University of Alaska Fairbanks. Seifert has been in this position for 19 years, and is well placed to provide support and credibility for this effort. His book "A Solar Design Manual for Alaska" was published by the University and he has been a member of the International and American Solar Energy Societies for 30 years. He is also the current treasurer of the Alaska Building Science Network; a 501C3 corporation dedicated to the promotion of energy efficient and healthful housing for Alaskans. The enhancement of the role this year for Golden Valley Electric, especially in playing a primary role in helping us develop a net metering arrangement for utilizing

and bringing on solar electric production within Interior Alaska and fringe areas just off-grid, will be especially useful. ABS Alaskan, Specialty Electric, and Alaska Renewable Energy are poised to participate in this as commercial enterprises. And Polar Wire may become a major distributor for a solar company as well.

Winter is not a very prime time for getting things accomplished or increasing the credibility of solar, although admittedly it is a great time to write a proposal. We intend to arrange with Heather Mulligan to have a training workshop to develop our plans for future activities, some time in April or May of this year (2001), after the anticipated deadline for this proposal submission.

We expect an enduring effort to evolve from this work. Alaska is no stranger to solar experience, and the rural areas of the state continue to provide fertile territory for competitive, creative and economical adaptations for solar technologies.

## Technical Proposal

### Project description

The project will involve a coalition of the University of Alaska, Cooperative Extension Service (the primary contact and responsible entity for financial obligations and administration), and retail businesses that have experience in the area of off-grid and renewable energy installations and sales. A list of collaborators is on the following page of this proposal.

We anticipated last year that we could begin to involve rural utilities in development of off-grid power options. This has not been accomplished, but it remains a high priority for us. The reason for this unique importance of the rural constituency is that rural electric utility costs are about five to ten-fold those in urban Alaska (for example, Anchorage, Fairbanks, and Juneau). Even though we have costed out that photovoltaic electricity will cost between 50¢ and 60¢ a kilowatt-hour for a standard small house demonstration. There are many places in Alaska right now where that is a competitive cost even with diesel generated electricity.

The unique situation of the Power Cost Equalization subsidy in Alaska, known infamously in Alaskan political circles as PCE, continues to be an opportunity if viewed appropriately. The concept of PCE is to lower, i.e., to *levelize* the costs of power in rural Alaska, regardless of village size or real costs, down to a cost of about 15 cents per kilowatt-hour. Because this is accomplished every year by a contentious appropriation of the Alaska legislature, it last year was changed to take money from renewable energy income from a pool of hydroelectric dams. Although this makes it less politically vulnerable, it nonetheless is a pit into which we pour money with no potential in sight for ever getting out of this pit, or lowering the costs of this subsidy to rural Alaska by investing in renewables which could eventually produce something. This situation is certainly ripe for a program like the Million Solar Roofs Initiative and may be able to significantly affect a solution to this present political and economic difficulty.

As mentioned previously, the coalition welcomes opportunities to utilize NREL or the US Dept. of Energy shared resources, contractors, and trainers whenever they might be available to us. We have already attempted to do this and will probably succeed in doing it in April or May of 2001. Most coalition members agree that we would greatly benefit from attending these training workshops and we would like to expand and to include technical training for skilled professionals, installers, and any technical support staff that would improve our competence and capabilities in achieving our 500 solar systems goal. And of course we are concerned that we have the best businesses onboard who see the potential for this and have a philosophical bent in the direction of renewable energies anyway.

We continue to believe we have some of the best businesses in this regard already onboard with our coalition, but we welcome expanded participation. We have in fact, added three new members, although most of them have been

interested individuals, rather than businesses. We do not hesitate to consider the creation of new solar businesses to supply solar systems. Nothing would make more difference however than the lowering of the first capital cost of photovoltaic cells to making solar a much more agreeable option to most on- and off-grid applications.

Pollution of rural Alaskan communities by leaking oil storage tanks continues to be a problem. This MSRI Initiative could provide a great service to the state by helping to eliminate the need for these polluting systems, and would eliminate noise pollution and diesel fumes by eliminating the diesel generating systems or at least diminishing their needs. Improvement of quality of life for rural Alaskans, and all who utilize renewable energy resources is a constant theme of our educational delivery. Achieving wider acceptance of the virtues and great advantages of solar and mixed renewable energy supplies is a clear purpose of proposing this work.

It is clear that a renewable future is the only ultimate option for most of the world, let alone Alaska. Although Alaska is overwhelmingly reliant on fossil oil and natural gas at present, an overarching purpose of this plan is to create a mandate through public awareness of the necessity, desirability and health and welfare implications of renewable energy use.

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Project Duration:

The project duration will be twelve months from the inception of funding, presumed to be April 30, 2001. However, the operative dates since last year's program began on July 1, we anticipate funding from July 1, 2001 to June 30, 2002.

Expected results:

Second year Million Solar Roofs initiative:

1. A group of coalition members will have grown and solidified and will have participated in PV instructor training, and state-of-the-art installation techniques. We will also have had a planning session for our second year of activity, hopefully completed before the inception date of this proposal, i.e., some time late spring 2001. We anticipate developing curricula for expanding

our educational outreach to youth and adults for educational efforts in renewable solar energy education.

2. Coalition members will have met again at least once face-to-face and we anticipate using the Alaska Building Science Newsletter (ABSN), again for our major technical communications and news about the Coalition. The newsletter mailing list is again about 1600 and is quarterly.
3. Concerning possible funding enhancements, Alaska has now been the recipient of monies through federal support for an idea called "The Denali Commission". This commission is modeled on the Appalachian Commission and is intended to develop in the first priority, sewer and water systems for Rural Alaska, but can be expanded to energy and other basic infrastructure needs. We are trying to develop a link with this particular funding in an effort to expand its reach and perhaps fund test applications of solar and other renewable utility systems in Rural Alaska. We already have a fairly good web Internet access coalition and Alaskans are precociously adept with the Internet and have, in some communities up to 60% saturation of e-mail and web access. We are going to take advantage of this.
4. Coalition members are extremely active and extremely well informed. We have no hesitation saying that our competence and "currency" will be foremost in our priorities and that coalition members, in addition to the coalition itself, will try and maintain an active awareness and up-to-speed technical awareness on latest software options, latest cost figures, and technical devices which can enhance and ease the solar transition.
5. We have a very important thrust and a deep interest among some, particularly the utility members of our coalition and establishing a net metering protocol such that the economics of PV generation can be improved. Member, Greg Egan (Alaska Renewable Energy) and the Golden Valley Electric Association members have already committed to working together to get us a clear policy on net metering. In that guise we are focusing some of the highest priority issues that the Million Solar Roofs Initiative is attempting.
6. We are also going to try and develop trainings for the construction industry, realtors, solar energy installers, and utility personnel as item #5 in the priority listing of efforts indicates. This is also a keen interest and we will take maximum advantage of DOE contractors in this regard. We also have a member who is keen on getting an "energy fair" type of exhibition for our major state fairs around the state for summer focus outreach. Although this is a nascent idea at this present time, it will hopefully come out of our planning and collaboration with the DOE MSRI coalition planning. We intend to release over the next month or two, the photovoltaics cost comparisons information to enhance the economic perception of solar as a viable option. Although these are not utterly compelling numbers yet, they do give people a very real and credible estimate of what they're costs will be at a certain level of investment and size commitment for their own needs. This is an ongoing prospect, which Seifert at the Cooperative Extension Service will support from a technical base. Members also contribute substantially to the proofing and the critiquing of these publications so that they are meeting the test of the market in Alaska.

## Evidence of Million Solar Roofs Leadership and Commitment and Public Participation

The involvement of the Cooperative Extension Service system in this proposal is strategic and provides credible leadership to the coalition. Rich Seifert, the initiator of this proposal, has been Extension Energy and Housing Specialist at Cooperative Extension for 19 years and has been a major force in renewable energy education and energy efficient housing education in Alaska. (See for instance webpage [www.sustainalaska.org](http://www.sustainalaska.org)) The Energy and Housing Specialist position in Cooperative Extension is the only one of its kind in the State. Therefore Seifert occupies a strategic and unique leadership role. Seifert has been active for 30 years in solar energy and has been member of the International Solar Energy Society since 1972. He has membership #379. He has served on various boards of directors and in the 1970s served as a National US Department of Energy Advisory Committee member to the Consumer Affairs Special Impacts Advisory Committee, 1976 through 1980.

In the early 80s he was a member of the founding Board of Directors of the Alaska Energy Center appointed by Governor Jay Hammond. In the late 80s he was on the State Energy Advisory Committee appointed by Governor Steve Cowper. During the 90s much of his focus in professional life was in energy efficiency education in housing. Seifert started along with an associate at Cooperative Extension, the Alaska Craftsman Home Program. And he now operates with the support of Alaska Housing Finance Corporation, a continuing "Cold Climate Homebuilding" and "Marine Climate Homebuilding" course delivered throughout the State to the public.

Seifert also participated in a very informative and intensive Fulbright Summer Study to Germany in June 1999 entitled "Alternative Energy and Environmental Protection". This was a study of efforts in Germany to move away from fossil and nuclear power to renewable energy. It included lectures by solar experts from Siemens Solar Corporation, Pilkington Glass, and the German Wind Energy Association, as well as visits to sites and energy efficient solar homes in Germany and Austria. Seifert also brings to the Solar Roofs Initiative, the utilization of a statewide energy efficiency and renewables newsletter. A copy of this newsletter will be attached to the technical proposal to indicate that passive solar design is already being covered by a feature article in the Summer 1998 issue, entitled "Passive Solar Building Design: In Alaska?" This newsletter is a quarterly publication financed through Seifert's connection with Alaska Housing Finance Corporation and would be utilized to provide regular coverage of renewable energy development.

In addition to Seifert's individual leadership in the area of energy and renewables, members of the Alaska Building Science Network are a very close knit community of energy efficiency and renewables expertise. There are several homebuilders amongst this membership and it provides a very unique Statewide network of informed and credible professionals who will provide a valuable capability in both delivering educational programs and getting adoption of

technologies through their recommendations. The Network has members in Southeast Alaska, Juneau, Ketchikan as well as Nome, Kotzebue, Dillingham, and many in Homer, Anchorage, and Fairbanks.

All of the corporate and commercial members of the Initial Coalition, **ABS Alaskan, Golden Valley Electric Association, Polar Wire, Sub-Arctic Solar Alaska, Alaska Building Science Network, Alaska Renewable Energy, Susitna Energy Systems, and Specialty Electric** in Homer have extensive and longstanding experience. ABS Alaskan has sold more than 300 off-grid, solar, and additional number of wind systems throughout Rural Alaska. There is undoubtedly more to be done here but the initial stature of the members provides insightful and credible leadership for this challenging undertaking of getting wider acceptance of solar energy applications in Alaska.

### Ability for other State and Local Partnerships to Learn from and Replicate Actions

We have already set up a subsite on our Cooperative Extension Service website ([www.uaf.edu/coop-ext/faculty/seifert/](http://www.uaf.edu/coop-ext/faculty/seifert/) Note: if you click under solar you get a link to our proposal, a description of our coalition, and publications relating to solar which are now on the web). Also we are linked to Western Sun, the Washington State coalition, and to the National Million Solar Roofs Initiative site.

Finally, we don't pretend that we are "setting the pace" in solar living for the country. Therefore learning from us is probably less likely than us learning from other states. We are open to that and look forward to it and have already learned a great deal in establishing references and contacts that are relevant to our efforts here in Alaska. The Sandia Laboratories USDOE collaboration for the photovoltaics workshop last September was an example. It was extremely helpful and a major opportunity for our coalition members for public exposure and credibility building.

### Potential Benefits and Barriers for Solar Energy Use

We intend to try and collaborate with our members to get us sales and inquiry information and to estimate whether there has been any impact from the Million Solar Roofs Initiative in the state. We provide access to the coalition chair by an 800 number from within Alaska and as always communication is very difficult. Anything we can do to make it easier by making it free by an 800 number is extremely helpful. We already have a file of inquiries and we distribute to all members the bi-monthly Million Solar Roofs national newsletter via e-mail. We will ask for, from our coalition members who are in the business of selling solar systems, sales records of solar systems during the years of our coalition work.

Barriers for solar energy use, we believe, are wide-ranging and widespread. They include: lack of confidence in renewable energy owing to a very poor performance record in 80s for wind power which was tested in Rural Alaska.

The general perception in Alaska is that because our long winters are subsequently dark, solar has no future in Alaska because it's not available when we need it most. To a degree this is true, but it neglects the fact that a great deal of summer utilization of energy could be provided by solar energy and we intend to accentuate the positive in this area.

In addition there is just a general reticence to confide in on-site, isolated rural energy systems, which are not as reliable or as familiar as the standard diesel systems. All this will take time and we understand the difficulties. We will also attempt to measure and document these barriers as best we can in order to refine and develop strategies for dealing with them in future efforts.

#### Applicant and Participant roles, Capabilities and Organization

Rich Seifert, Cooperative Extension Service, will facilitate communication, organize quarterly gatherings and meeting exchanges for information and updates. How we will organize and what our strategies will be for commercial development are yet to be determined because we have not yet met with the planners/contractors provided by DOE. As previously mentioned, this will occur in April or May of 2001 still within the domain of last year's funding.

Funding will be channeled through Cooperative Extension Service, a department of the University of Alaska Fairbanks. Seifert will be responsible for financial management. However, we intend that all members of the Coalition, named in this proposal, will serve in the role of defacto staff and will be able to travel under University auspices and with the coalition support through this grant.

The capabilities of each applicant and participant have been thoroughly covered in previous sections of this proposal, but since we are so widespread and some of us live 300 miles from the others, we will need to have resources available, particularly for travel. We anticipate approximately a \$10,000 to \$15,000 travel budget for professional development seminars, and to get professional development seminars here for solar planning and coalition support.

Other required resources or support for newsletter additions, costs of teleconference communications, phones, mailings, and educational efforts. We plan to approach the problem both from the grassroots public constituency and their education, as well as attempting to educate the professionals of the rural village and electric cooperative realm. We hope to bring these two together to institute a housing, utility, and public coalition, which might increase demand for renewable onsite electrical energy.

The experiences and qualifications, resumes of key personnel are attached.

## **Statement of Work**

The following are general descriptions of work proposed under this project. We will divide the work into tasks and the task descriptions are intended to identify specific areas where we hope to undertake significant efforts. Since we are entering the second year of our work, it is difficult to be overly specific in our efforts. Solar technologies have been receiving so little attention over the past decade in Alaska, that we hope to undertake a sort of reawakening by asking a series of the right questions. We will focus this around Task 1, Identifying Barriers to Solar Applications in Alaska.

The best way to identify these barriers is to do a survey. We shall continue the conducting of a survey utilizing our newsletter, and the opportunities available through our housing workshops by including survey questions in the evaluation of these workshops. We can get subtle but effective information about the credibility, perception, and potential utilization and application of local solar systems, when people are about to purchase housing. This is a very focal place to do a survey and we can do it for very little cost in a very wide audience that is very focused on housing issues. We have not had a chance to fully explore this in our first year of funding because it only came available in July and most of our workshops are yet to occur in the springtime. The most active time of the year for this survey work is from 15<sup>th</sup> January to 15<sup>th</sup> April, before the building season begins, but close enough to the building season where people are actually focusing on housing.

An important second task, Task 2 will be the development of workshops and technical transfer methods. As indicated previously, these are in the planning mode and have yet to be accomplished but should be over the next year and a half. One of our strengths in Cooperative Extension is the development of tech. transfer course work. There is already a vast amount of course syllabi and possible topics, which we could bring to Alaska to aid in our tech. transfer. However there are very many ways to go in this educational effort including a general public awareness course which can be developed within Cooperative Extension and delivered through Extension's outreach workshops. We will create syllabi for several such courses, both technical training and public information and education courses as part of the deliverables.

Both Task 3 and Task 4 continue much the same as we proposed them last year because again we haven't had a chance to travel nationally to exchange experience with other Million Solar Roofs Coalitions (although that is anticipated to occur at the spring meeting in Washington D.C. of the American Solar Energy Society). This is one of their quadrennial meetings in Washington D.C., which Seifert plans to attend. It is hoped that there will be a special session for Million Solar Roofs groups in our region or nationwide. This is a continuing goal and we will continue to reach out to others around the country who have more experience than we do.