

Encouraging Energy Conservation and the Use of Alternative Energy:
A Model for Rural Communities

Case Study – Northeastern Santa Cruz County, Arizona

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Introduction

The challenges of living in a rural area are many. Among them are the relative difficulty involved with accessing a variety of basic resources, including some government and business services, and the minimal amount of political clout wielded by rural residents. For example, city residents commonly have a choice of transportation options ranging from walking and bicycles to mass transit and personal vehicles, while in rural areas personal vehicles are often the only option. For people living in an unincorporated area, opportunities to interact with the region's political representatives can be rare, and frequently the priorities of politicians are dominated by larger population centers. Even the cooperative which provides electricity to rural residents can sometimes become an adversary.

Researchers who study rural areas in the U.S. face a related set of challenges, as do activists who live in many of those rural communities. There are, however, numerous opportunities that present themselves and many federal and state government programs, as well as those sponsored by non-governmental organizations, that are designed to facilitate their efforts to better understand and communicate the issues and achieve positive impacts for rural U.S. residents. One such program is the Innovation Grants Program sponsored by TogetherGreen, an initiative created by an alliance between the National Audubon Society and Toyota. A TogetherGreen grant funded the work of a partnership among volunteers from the Audubon Society's Appleton-Whittell Research Ranch and two local organizations in rural Santa Cruz County, Arizona. That partnership evolved into an organization named Practical Energy for Rural Communities, or PE4RC, and this is its story.

There are two primary purposes for this report. First, it provides a publicly accessible record of the activities performed and the results obtained by PE4RC Team members before and during its creation and in the organization's first year of operation. The second and more important motivation for documenting the Team's work is to provide a model that other rural community members can use as a basis for organizing their own carbon footprint-reducing organizations. It is perhaps the Team's greatest goal to actually inspire and motivate others to become activists, or at least highly motivated to pursue positive changes in their own communities, who advocate for the most rapid and effective transition to a more sustainable system of energy use, conservation, generation and distribution.

The report begins with a brief description of the geography, demographics and history of Santa Cruz County, focusing on the PE4RC study area. Then the series of events that led to the founding of the organization are laid out, starting with the 1982 contract that ultimately led to the actions that resulted in PE4RC's formation and concluding with the Team's expectations for its future. The activities performed by Team members during the first year and the results they achieved are presented in detail. The report concludes with a set of observations and recommendations, including a model for creating carbon footprint-reducing organizations in other rural communities.

Geography, Demographics and History of the Area

Santa Cruz County is small in terms of both population and area. At 1,238 square miles, it is the smallest of 16 Arizona counties, and its 2009 population of 43,771 is fourth-smallest in the state. The southern boundary of the county is also the state and national border, and the city of Nogales, Sonora, Mexico has a municipal population estimated at 193,517 by the 2005 Mexican census, about ten times that of Nogales, Arizona, which is the Santa Cruz County seat. Figure 1 shows the locations of the county within Arizona and the towns and Census Designated Places within the county.

The PE4RC organization is based at the Audubon Society's Appleton-Whittell Research Ranch (AWRR) near Elgin, and its efforts are focused there and within the town of Patagonia and the unincorporated community of Sonoita. Elevations in the populated areas range from 4055 feet in Patagonia to around 4800 feet in Sonoita and Elgin, with the rolling hills in the area punctuated by the Santa Rita Mountains to the north of Patagonia and the Mustang and Huachuca Mountains to the east. The proximity of the various mountain ranges in the area gave rise to the area's colorful description: The Mountain Empire. In contrast to the deserts which characterize much of the rest of southern and central Arizona, PE4RC's home is an arid grassland, with annual precipitation averaging about 18 inches. The area is home to several large ranches, including the 28,000 acre Babocomari Ranch, which is immediately north of the 8,000 acre AWRR. Elgin is also the location of the first commercial-scale wineries in Arizona, although most of the wines produced there are made from grapes shipped in from California and elsewhere. Sonoita is home to a large U.S. Border Patrol station and the Santa Cruz County fairgrounds.

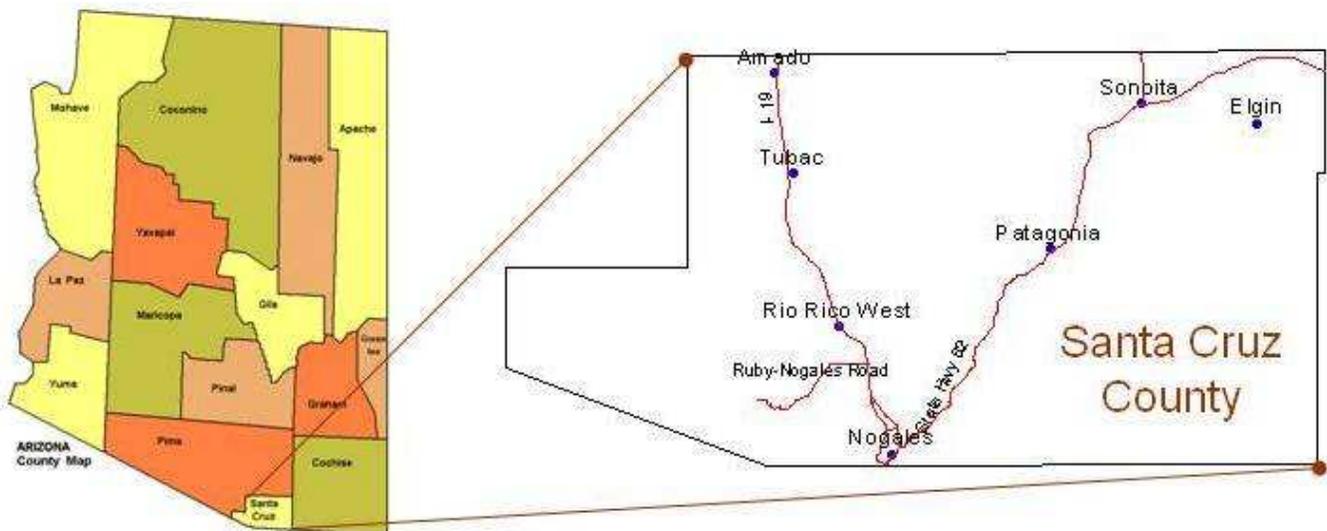


Figure 1. Locations of towns and major highways in Santa Cruz County.

Demographics

Most of the residents of Elgin and Sonoita live in homes situated on large (1-2 acre) lots or 2-40 acre ranchettes. Patagonia is more densely populated, with its population of about 800 residents spread out over the town's 1.2 square miles. As is the case with most other areas of Arizona during the economic downturn that started in 2007-8, the population growth rate has declined throughout The Mountain Empire, and Patagonia's population has been essentially constant for the last ten years. Figure 2 shows the area's population levels in 1990, 2000 and 2007 for the town of Patagonia and the Census Designated Places (CDPs) Elgin and Sonoita.

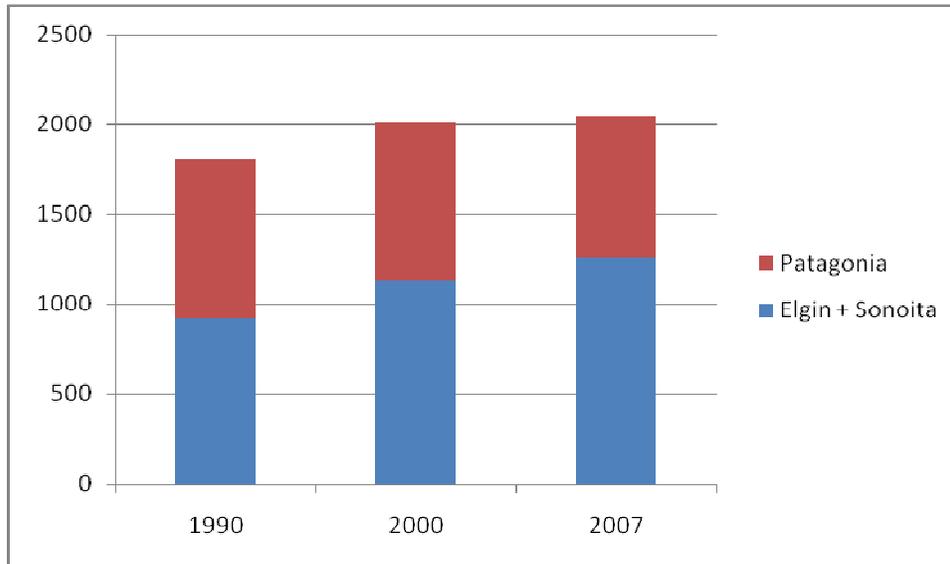


Figure 2. PE4RC study area population growth.

Sources: U.S. Census for 1990, 2000 and Patagonia 2007; City Data for Elgin+Sonoita 2007.

A somewhat broader geographic region which includes the sparsely populated areas outside of Patagonia, Elgin and Sonoita is included within Block Groups 1 and 2 (BG1 and BG2) in Census Tract 9960. The combined populations of BG1 and BG2 were 1,979 in 1990 and 2,466 in 2000, so given the minimal population growth from 2000 to 2007, 2,500 is a good estimate for the entire PE4RC study area's population in 2010. Figure 3 shows the geographic areas represented within Census Tract 9960. The 2000 Census count of housing units measured 502 in the Town of Patagonia, 417 in the Sonoita CDP and 146 in the Elgin CDP, a total of 1,065 housing units in the PE4RC study area.

Social, Economic and Political History

Prior to 1450 CE, the Santa Cruz and San Pedro River valleys, a larger area that includes portions of today's Santa Cruz and Cochise Counties, were occupied by Hohokam Indians. The Hohokam population was replaced, and possibly driven out, by the Sobaipuri and other Piman people who occupied the area during the early explorations by Fray Marcos de Niza and Francisco Vázquez de Coronado in 1539-40. Archaeological evidence and the historical records of this period, which are limited to little more than Jaramillo's chronicle of Coronado's explorations and Niza's diary, indicate the existence of numerous relatively densely populated agricultural communities along the San Pedro River (Seymour) and also along Sonoita and



Figure 3. Census Tracts in Santa Cruz, western Cochise and southern Pima Counties. Source: American FactFinder (2000b).

Harshaw Creeks (Fontana et al). By the time of the arrival of Jesuit missionary Father Eusebio Kino, who established missions in what are now Sonora, Arizona and California, including one at Tumacacori, in the late 17th Century, the population of the agricultural communities along the Santa Cruz and San Pedro Rivers and their tributaries had declined substantially (Seymour).

Father Kino is considered to be the father of ranching in southern Arizona. In 1696, he brought in small herds of livestock and contributed cattle and horses to the Sobaipuri settlement of Quiburi on the San Pedro River and to the Upper Pimans, who were led by Chief Taravilla, in the area that is now the location of the headquarters of the Babocomari Ranch. These cattle and horses thrived in the grasslands of southeastern Arizona, and the herds proliferated throughout the PE4RC study area during the 18th and 19th centuries. Overgrazing, which was exacerbated by the severe drought conditions in the 1890s and 1930s, led to topsoil erosion and other related problems before more sustainable ranching operations were subsequently implemented (Brophy). The introduction of exotic grasses such as Lehmann lovegrass for livestock fodder and erosion control has also negatively impacted the native plant and animal communities in the area (James).

Ranching continues to be an important part of the economic and social fabric of Santa Cruz County. One of the ranching families who owned land in the county was the Appletons. In 1968, Frank and Ariel Appleton established the Research Ranch Foundation and removed all livestock from their ranch. They invited researchers to use the ranch as an ecological study platform. The 8,000 acre Appleton-Whittell Research Ranch has been managed by National Audubon Society since 1980, and is a partnership between the Bureau of Land Management, U.S. Forest Service, Swift Current Land and Cattle, LLC, The Nature Conservancy, The Research Ranch Foundation and Audubon.

Beginning with the planting of Arizona's first commercial vineyard in Elgin in 1979 and the establishment of a winery in 1983, the Elgin-Sonoita area now houses nine vineyards and/or wineries. The soils and overall growing conditions there are quite favorable for a variety of wine grapes, although they must be irrigated by pumping groundwater, and a number of award-winning wines have been produced in those wineries in recent years. Historically, mining has been an important economic activity in some of the more mountainous areas in the region, and two large mining projects, the Rosemont mine north of Sonoita and the Wildcat mine near Patagonia, are now in their developmental/permitting stages.

Santa Cruz County was created by the 20th territorial legislature on March 15, 1899 from the southeast corner of what was then Pima County. After Arizona achieved statehood in 1912, Santa Cruz County was governed by a 3-member Board of Supervisors. Each county supervisor represents a geographic district, and the Elgin-Sonoita-Patagonia area is included in District 3, for which John Maynard is the current Supervisor. The Town of Patagonia was founded in 1898 and incorporated in 1948. It is governed by its mayor and 4-member town council. Sonoita and Elgin are not incorporated and do not have formal political or governing bodies, but the Sonoita Crossroads Community Forum (SCCF) is composed of area residents who are active in the community and are concerned about the present and future conditions in the area.

Electricity is provided to residents and businesses in the PE4RC study area by Sulphur Springs Valley Electric Cooperative (SSVEC or the co-op), which was established in 1938 to bring power to the residents of rural southeastern Arizona. The Town of Patagonia provides water and wastewater services to its residents, but the residents of Sonoita and Elgin, along with the ranches, vineyards, wineries and other area businesses rely on wells or rainwater harvesting for their drinking and irrigation water and on site septic systems. Natural gas, provided by Citizens Gas, is available through underground pipelines in Patagonia and propane is supplied elsewhere in the area by Amerigas and Barnett Gas.

People who choose to live in rural areas are in general highly self-reliant, and those who reside in the PE4RC study area are no exception. Although the vast majority of area residences and businesses are connected to the electrical grid, there are several homes that are off-the-grid and many more with solar energy systems that provide up to 100% of their net annual electricity and space and water heating needs. Area residents are also highly aware of and connected with the natural systems that provide the basis for the innate beauty of the mountains and rolling, grass-covered hills as well as the ecological communities that are the foundation for their ranching operations.

The Origins of a Community-Based Energy-Focused Organization

The single event that proved to be the ultimate cause for the creation of the PE4RC organization was SSVEC's 1982 purchase of an easement to construct a power line (specifically a 69 kilo-Volt sub-transmission line) along the southern boundary of the Babocomari Ranch. The 69 kV line is part of SSVEC's plan to provide power to the growing Elgin-Sonoita-Patagonia area when the existing 25 kV distribution feeder reaches and then exceeds its capacity. The plan also includes the construction of a substation in Sonoita. At the time it was negotiated, the contract to purchase the easement was executed by just one of the

partners who own the Babocomari Ranch, and its existence was not made public until many years later.

In the early 1990s, representatives from SSVEC held discussions with residents along the potential alternative routes of the 69 kV line between the west end of the Babocomari Ranch and the then-preferred Buchanan site for the substation in Sonoita. At that time, the peak electrical load was approaching the capacity of the Huachuca substation, which was then 3.8 MW, and the co-op's management was receptive to community input regarding routing, pole appearance, and other specifications of the line. At a series of meetings attended by members of an advisory committee assembled to act as a liaison between SSVEC and the community from late 1991 through the spring of 1993, it became clear that there was strong local opposition to the construction of the power line across the Babocomari Ranch easement. The result of the meetings was that SSVEC dropped its plans to build the new line, and instead increased the capacity of the Huachuca substation to 7 MW in 1998 (see Figure 4). The construction of the line and the Sonoita substation would not again become an important issue to area residents until 2006.

During the period between 1991 and 2006, the population of the Elgin-Sonoita-Patagonia area grew by about 12% (see Figure 4), but peak electricity demand, which is supplied via a circuit designated as "the V-7 feeder," increased from 3.7 MW to 6.7 MW, approaching the 7 MW capacity of the Huachuca substation. In March 2006, SSVEC again started moving forward with the plan to construct a new power line across the Babocomari Ranch. The managers of the ranch, which as a group had never supported the idea of a sub-transmission line running along the southern boundary of the ranch, would not allow the construction of the line on ranch property to proceed. Therefore, in March 2006 SSVEC sued the Babocomari Ranch Company, LLLP and the result of the subsequent litigation was a June 30, 2008 settlement that allowed SSVEC to proceed with the project.

In the spring of 2008, the Sonoita Crossroads Community Forum (SCCF) assembled a committee to act as a liaison between area residents and SSVEC as the co-op again began to move forward with its plan to build the 69 kV line and the Sonoita substation. As a result of the discussions with community members who opposed building a substation at the Buchanan site, SSVEC management purchased a 2.5 acre site for the new substation in an area of Sonoita zoned for industrial use. On July 22, 2008, SSVEC made a presentation (SSVEC 2008a) to area residents to introduce the Sonoita Reliability Project to community members and address their concerns. At the conclusion of this meeting, many in the audience expressed dissatisfaction with SSVEC's insistence on constructing the 69 kV line across the Babocomari Ranch and then along one of four routes through Sonoita to the new location of the substation. They were also unhappy with the co-op's lack of interest in having a meaningful dialog with community members about the routing of the line and the viability of alternatives to the line and the substation, including energy conservation, peak demand shifting and the installation of photovoltaic (PV) arrays on residences and businesses.

After two more meetings with SSVEC representatives during the fall of 2008, many more community members began to object to the impacts of running the new sub-transmission line across the mostly undeveloped corridor along the boundary between the Babocomari and Research Ranches, and many questioned whether the 69 kV line was even necessary based

Increasing Load vs. Capacity

Huachuca Substation Reaching Capacity

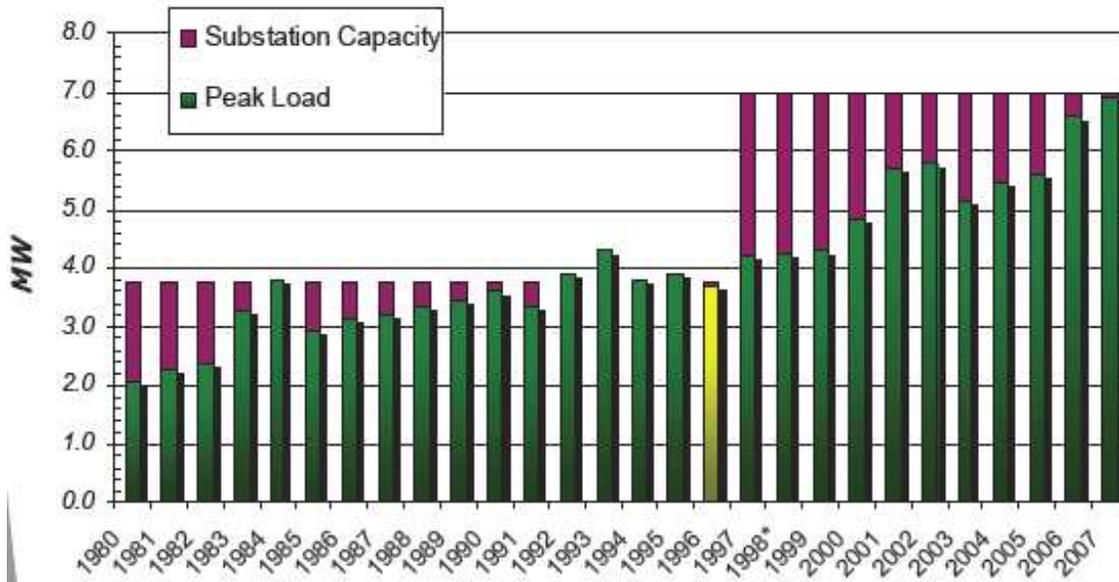


Figure 4. Peak electrical load and capacity of the SSVEC Huachuca substation, 1980-2007. Source: SSVEC (2008b).

on the two primary reasons SSVEC had given for constructing the new line—the relatively high number of power outages on the V-7 feeder and its near-capacity status. The new substation in Sonoita would clearly address the steadily increasing levels of peak demand (see Figure 4) and reduce the average duration of power outages, but many community members were skeptical about the financial estimates provided by SSVEC managers for the costs of installing the new sub-transmission line along their preferred route and of upgrading the conductors on the existing distribution lines that run along State Route 82.

Residents of the areas that would be affected by the new line had become increasingly uncomfortable with SSVEC's non-responsiveness to the concerns of the community. As a result, in November 2008 a group of activists led by Gail Getzwiller of Sonoita created an organization named Save the Scenic Sonoita/Elgin Grasslands, or 3SEG. Its stated purpose was to find alternatives to the 69 kV line, and to thereby prevent the line from being constructed. 3SEG members prepared a "Point Paper" (3SEG 2008) which included a set of alternatives to the line and presented it to SSVEC on December 11, 2008. A January 17, 2009 presentation by SSVEC made it clear to area residents that the co-op had no intention of giving serious consideration to the alternatives proposed by 3SEG, so its members changed their strategy to one over which they had more control: installing renewable energy systems, primarily residential PV systems, on their own homes and businesses, and encouraging other community members to do the same. 3SEG members and their partners also developed

several proposals for 1 MW renewable energy systems, but none of them were acceptable to SSVEC.

In February 2009, the SCCF established a Renewable Energy Subcommittee (RES) which was tasked with developing specific proposals for renewable energy projects and organizing the second annual Santa Cruz County Energy Expo, which was held on April 11. The Expo drew 300 area residents to speak with representatives of 15 exhibitors from solar and wind energy design and installation companies. Later that April the RES, which included Linda Kennedy of the AWRR, along with Sonoita residents Jeanne Horsmann of the SCCF and husband Rob Horsmann of the Cienega Watershed Partnership, prepared and submitted a grant application to TogetherGreen under its Innovation Grants program. The TogetherGreen initiative is an alliance between National Audubon Society and Toyota.

The RES was successful in its request and received a \$24,400 Innovation Grant for 2009-2010 to support efforts to reduce the carbon footprint of the area. One long-term goal of the project funded by this and subsequent grants is to develop a replicable strategy that can be used by members of other rural communities to help achieve their own energy conservation and renewable energy implementation goals. The grant provided funding for a research fellowship, a survey of residents to determine energy usage and attitudes, and some administrative expenses. The management of the AWRR and members of the Sonoita Crossroads Community Forum and the Cienega Watershed Partnership also strongly desired a more sustainable alternative to the 69 kV line along the Babocomari Ranch easement and they planned to leverage the momentum achieved by the RES to demonstrate that it was not necessary, and it was hoped that the grant would help them achieve that goal too.

During the late spring and summer of 2009, RES and 3SEG members continued to work with renewable energy companies and consultants who proposed several projects which could use solar and biomass-fueled energy to provide power for the study area. Area representatives made a brief presentation about their proposed renewable energy-powered alternatives to the new sub-transmission line at the May 27 SSVEC board meeting. The repeated outreach efforts by RES members and others about developing solar energy within SSVEC territory finally seemed to make an impact when on July 7 the co-op's managers issued a request for quotation (RFQ) to "Develop a Solar Energy Generation Facility" to be constructed next to the substation that would be built in Sonoita. A week later, RES members and other local residents made a formal presentation to co-op decision makers to answer questions they had about the proposals included in the Point Paper. The end result was again a refusal by SSVEC to work with the companies who had made proposals for building renewable independent power producing facilities in the study area, but the RFQ eventually led to a plan for the co-op to build a 750 kW PV system adjacent to the proposed substation in Sonoita.

In October 2009, the RES members who became known as the "TogetherGreen Grant Team" selected Wayne Porter (author of this report) to join the Team as a Research Fellow. His primary responsibilities during the one-year fellowship were to design and execute a mass-mailed survey to all study area residents, to work with team leader Jeanne Horsmann to develop an outreach program with which to connect with area business and political leaders, and to document the Team's activities with the objective of developing a set of strategies that could provide advice and guidance for the activists and leaders of other rural communities to

advance their efforts to reduce their own carbon footprints and move toward achieving energy sustainability. After a couple of brainstorming sessions, Team members agreed on the name Practical Energy for Rural Communities and its acronym PE4RC for the new organization.

Objectives

The grant application the RES submitted to TogetherGreen contained the following summary of its overall project objectives:

We will create a model for rural communities that will significantly reduce the threat of greenhouse gas emissions through production of electricity through alternative energy, by implementing energy efficiency upgrades on existing structures and by promoting energy efficient standards on new construction. We believe our rural community (Northeastern Santa Cruz County, Arizona) can generate the electricity we use through alternative energy technologies and energy efficient options, thereby reducing our dependence on electricity generated by fossil fuel consumption. We hope that, within 2 years, we will have commitments from 25% of the home and business owners to install systems that will produce at least 2kW each or significantly reduce consumption by increasing the energy efficiency of our homes and businesses. Within 10 years, we hope that 100% of homes and businesses in the area will be reducing greenhouse gas emissions through use of alternative energy sources or through passive techniques such as thermal mass walls, heavily insulated roofs or high performance windows.

The other significant objectives for PE4RC were to develop a strategic plan with which to guide the future of the organization and begin to build a grassroots network in order to help get the word out about upcoming events where community members can learn about or otherwise benefit from grant opportunities or other government or business-sponsored programs.

Funding

The initial \$24,400 grant from TogetherGreen was used primarily to pay the Research Fellow's \$15,000 stipend and a \$5,000 fee to a consultant for advice, facilitating the Energy Summit and developing PE4RC's strategic plan. The grant also funded the mailing and duplication expenses for the survey of area residents. Team leaders identified additional funding sources which were tapped to fund the expenses incurred in conjunction with the 3rd Santa Cruz County Energy Expo (see below for more information about the Summit and Expo).

Future

The results of the first year were deemed to be successful enough to warrant TogetherGreen's award of a \$15,000 grant to fund another year of PE4RC's operation. The budget for the second year's activities includes funding to pay \$3,750 to the Energy Expo IV Coordinator, \$3,000 to the Project Coordinator responsible for education and outreach, \$2,500 to the Strategic Planning Consultant, and \$1,500 for website development and maintenance. All of those positions had been staffed on a volunteer basis during the first year. The shifts in PE4RC's priorities and its planned activities for the second year are described in detail below in the Results section.

PE4RC's Activities

The initial activity performed by the TogetherGreen Grant Team was to recruit and engage the Research Fellow who would help design and execute a survey of area residents and document the project in order to prepare a report describing organization's efforts and other activities. The grant application contained a list of nine other potential activities that could be undertaken,

and Table 1 describes them. The remainder of this section describes the activities organized and performed by PE4RC team members during its first year.

Table 1. List of potential PE4RC activities and their outcomes.

Activity	Attempted?	Outcome
1) Discover the level of knowledge and interest in the local population through surveys	Yes	Positive
2) Work with local county officials to address code issues	Yes	Positive
3) Coordinate with local power cooperative to address compatibility issues	No	
4) Engage local commercial enterprises to place renewable energy systems on their businesses	Yes	In Progress
5) Educate and encourage local residents who are financially able to implement construction of renewable energy projects	Yes	In Progress
6) Develop worksheet to serve as a template for implementing renewable energy systems	Yes	Positive
7) Engage local community organizations to assist with educational opportunities	Yes	Positive
8) Discover funding opportunities for low-income residents and non-profit organizations	Yes	Positive
9) Host workshops or seminars showcasing sustainable energy generation and passive conservation practices	Yes	Positive

2009 Energy Summit in Patagonia

On December 14, 2009, four members of the PE4RC Team hosted a gathering of a dozen area activists, energy experts and political officials, including Santa Cruz County Supervisor John Maynard and Sara Hummel Rajca, the Solar Outreach Coordinator for U.S. Congresswoman Gabrielle Giffords, who represents the Arizona district that includes the study area. The purpose of this energy summit was to establish a set of specific priorities and goals for the first year of the organization’s operation. The meeting was facilitated by PE4RC planning consultant, Karen LaFrance. In breakout groups of five, summit participants discussed the perceptions of energy cost and conservation as seen by various local institutions and groups of residents and the potential avenues with which to reach out to each of them. Then the groups reconvened and everyone participated in a brainstorming session about possible strategies to influence the process of land use planning in Santa Cruz County in order to facilitate official guidance that promotes energy efficiency and the implementation of renewable energy systems.



Figure 5. 2009 Energy Summit participants.

The final set of discussions at the summit culminated in a poll of the attendees. The objective of the poll was to determine the top priorities on which to focus and activities to perform during the first year of TogetherGreen grant funding. The top priorities and activities as indicated by the preference poll are included here.

Top Priorities

1. Work toward the creation of a Santa Cruz County Green Building Program,
2. Promote job creation through re-training, and
3. Perform energy efficiency outreach and education efforts.

First Year Activities

1. Conduct the Energy Expo in 2010, and
2. Do outreach to encourage weatherization.

.PE4RC web site

The domain name pe4rc.org was purchased and a Google-powered web site was created in January 2009. The primary purpose for the site (<http://pe4rc.org>) was to be a repository of news and other information that could be downloaded directly from the site. It is also a gateway with links to other sites with background primers or interesting presentations about energy conservation and efficiency and about energy in general: its economic, social and environmental impacts, both locally and globally. It was also designed as an interactive platform but the Team was unsuccessful in getting any dialogs started via the site.

Energy Priorities, Actions and Knowledge Survey

One of the specific activities described in the TogetherGreen grant application was to conduct a survey of the households in the PE4RC study area. The survey's primary purpose was to measure residents' interests and priorities regarding energy conservation and renewable

energy. Team members designed a ten-question survey that became known as the Energy Priorities, Actions and Knowledge survey. Describing it as a “ten-question survey” is somewhat misleading, because half of the questions had a list of seven or more items to check, and it took most people between seven and ten minutes to complete. Using the AWRR’s bulk-mailing permit, the 3-page survey packet, which included a cover letter/return mailing label page along with English-language and Spanish-language versions of the survey instrument, was mailed to all of the 1,988 P.O. Boxes and street addresses that are handled by the Patagonia and Sonoita Post Offices.

Online versions of the survey were also implemented, and invitations to respond to it were sent to the 380-address e-mail distribution list maintained by the SCCF. A total of 147 responses were received and one of the results was requests by more than 70 respondents to add their e-mail addresses to the PE4RC announcement list. Team members worked hard to publicize the survey by making appearances at local meetings and posting flyers in Sonoita and Patagonia to encourage residents to respond online or by mail, and felt quite satisfied with the 7% response rate. Other key results include:

- Over 70% of respondents believe that installing renewable energy technology is important
- About 40% of respondents have already installed (20%) or plan to install (20%) solar technology
- 80% of those who had not yet implemented renewable energy technology cited cost as a factor

Detailed results of the survey, along with the cover letters and survey instruments, are available to view or download from Survey page of the PE4RC web site.

Interaction with Santa Cruz County officials

In January 2010, Linda Kennedy and Wayne Porter met with County Supervisor John Maynard to discuss the implementation of a Green Building Program (GBP) in Santa Cruz County (SCC). Supervisor Maynard is keenly aware of the importance of green building and committed to establishing a voluntary program to facilitate more sustainable design and construction practices in the county. It is significant that his candidacy was supported by a grassroots effort led by northeastern SCC residents who shared his vision about advancing sustainability principles and the importance of education in the county. It was agreed that PE4RC Team members would work to facilitate, publicize and support the new GBP while Supervisor Maynard would lay the groundwork for the program within the SCC administration.

The early interaction with John Maynard led to an opening of communication channels between PE4RC and SCC Director of Community Development Mary Dahl and Chief Building Official Bob Banzhof, who were the key administrators who drew up the standards and introduced the GBP at the June 24, 2010 meeting of the SCC Planning and Zoning Commission. The program is described in more detail below in the Results section.

Santa Cruz County Energy Expos

A year after a similar but smaller event in 2008, the SCC 2nd Annual Energy Expo was held on April 11, 2009 at the County Fairgrounds in Sonoita. The latter event attracted 300 attendees and featured 15 exhibitors, most of which were renewable energy design and installation firms. SCCF RES members led by Jeanne Horsmann raised over \$1,500 in donations, including

\$500 each from SSVEC and AEPSCO, the Arizona Electric Power Cooperative, which operates the coal-fired Apache Generating Station in Cochise, from which SSVEC purchases the bulk of its power.

As the PE4RC Team Leader, Jeanne also coordinated the 3rd Annual SCC Energy Expo, which was held March 27, 2010 at Patagonia Union High School. Based on the success of the 2009 Expo, Jeanne raised over \$3,650 in cash from sponsors, most of which were among the 34 exhibitors at the event, along with in-kind contributions of prizes valued at \$3,227 that were raffled off during the event. The 2010 Expo featured a presentation by Sara Hummel Rajca from U.S. Representative Gabrielle Giffords' office and nine other presentations, including three by PE4RC Team members and three others by area residents who described their own success stories with off-grid living, energy and water conservation.

The Team used a variety of channels to publicize the Expo, including newspapers in Patagonia and Nogales, public service announcements broadcast by KPUP radio in Patagonia, flyers posted in Sonoita and Patagonia, and web pages on the PE4RC and Patagonia library sites, as well as e-mail announcements sent to the PE4RC and SCCF distribution lists. It attracted 200 attendees, but despite the drop in attendance, post-Expo exhibitor surveys indicated they were satisfied with the turnout.

PE4RC Team members believed it was important to feature area residents at the Expo, so its exhibit was a set of photographs and descriptions of eight area solar and wind energy systems. The exhibit included comments from each of the systems' owners, including a list of "gotchas" that prospective renewable energy system owners should look out for when choosing and installing a new solar or wind-powered system.

Greening Your Home Tours in Patagonia and Sonoita

PE4RC Research Fellow Wayne Porter organized and promoted a pair of "Greening Your Home Tours" (GYHTs) in Patagonia and Sonoita in the spring of 2010. Team members agreed on the title for the tours to emphasize the importance of making homes more efficient and livable instead of simply relying on a renewable energy system to decrease their consumption of fossil fuels. Despite modest turnouts (ten in Patagonia and six in Sonoita), tour participants recognized the value of speaking with their neighbors about their experiences with green building techniques and solar energy systems, and in the case of Kate Tirion's home in Patagonia, establishing a permaculture oasis and using passive solar design concepts.

As was the case with the channels the PE4RC Team used to promote the Energy Expo, a combination of media outlets was utilized to publicize the tours. Based on conversations with tour participants, four different media channels—web sites, radio spots, e-mail announcements and flyers on bulletin boards—were cited by participants when asked how they had heard about the tour in Patagonia. For the more widely dispersed population in Sonoita, only Wayne's appearance at a Rotary Club breakfast meeting and direct e-mail announcements were cited by tour participants as their information source for the tour.



Figure 6. Wayne Porter at GYHT "headquarters" in Patagonia.

Presentations sponsored or presented by PE4RC

The primary opportunity for PE4RC to use formal presentations as a method to reach out to and educate study area residents was the Energy Expo in Patagonia. The three presentations delivered by PE4RC Team members at the Expo were designed to provide information to attendees about why it is important to include distributed renewable energy systems in the power generation mix in the future, particularly solar energy in southern Arizona, and how to plan and design a residential PV system.

PE4RC also sponsored a series of three presentations by Brad Lancaster on rainwater harvesting in conjunction with the Patagonia Trails Day event that was held in April 2010 as a celebration of Earth Day in Patagonia. Team members believe that water conservation is vitally important in southern Arizona and that water and energy use are strongly interrelated, and this idea is confirmed by the fact that SSVEC sponsored the series of water harvesting lectures. The first Lancaster presentation drew a nice crowd of over 40 people on a Friday evening in Sierra Vista, which along with adjacent Fort Huachuca is the major population center in Cochise County.

The AWRR hosts a monthly potluck dinner which is followed by a presentation that is usually focused on biology or ecological research on or near the ranch. Following the announcement that it had been awarded a grant to install two PV systems, which are described below in the Results section, AWRR manager Linda Kennedy asked Wayne Porter to deliver an energy-focused presentation following the June potluck. The slides he used for the presentation titled "Renewable Energy in Southeast Arizona" are available on the PE4RC web site (Porter 2010).

Outreach activities

One of the top priorities for PE4RC that was identified by participants in the 2009 Energy Summit described above was to take advantage of opportunities to reach out to area residents whenever possible. That same goal was also specified as one of the key elements in Porter's successful proposal for what he would do as the organization's Research Fellow. The first opportunity to interact with community members occurred just a week after his first visit to the area. During the summer and fall of 2009, Patagonia resident Carolyn Shafer, who was also an Energy Summit participant, organized a series of seminars at which area residents discussed various aspects of sustainability and the things they could do to live their lives more sustainably. The new PE4RC Research Fellow eagerly took advantage of the opportunity to meet and speak with Patagonia residents during the final two seminars in the series. The discussions provided a valuable introduction to the area and an indication that there was a substantial portion of the community that was interested, and that would potentially be active, in energy issues and events.

Two other outreach channels, personal and electronic, were repeatedly used by PE4RC Team members to interact with study area residents. Face-to-face interactions were facilitated and printed materials were distributed at table exhibits at area events including the Empire Ranch Roundup and the Patagonia Trails Day. Electronic communications were sent by e-mail to "Friends of PE4RC" to announce various conservation and energy-related community events such as the meetings of the SCC Planning and Zoning Commission at which the Green Building Program was discussed.

Development of a strategic plan to guide future activities

In the spring of 2010, a strategic plan was developed by the PE4RC team to document the results of the energy summit and to serve as a guide to the organization's future activities. and events. Elements of the plan were utilized in the application to TogetherGreen for a grant to fund PE4RC's second year of operation.

Results

During its first year of operation, PE4RC achieved two of its top three priorities and accomplished both of the specific goals suggested at the Energy Summit. One priority that was developed for the organization during the 2009 Energy Summit was to "promote job creation through re-training," an idea that was promoted at the summit by Stephen Boyle, who is the founder of the Bellows Institute, which was at the time of the summit located in Patagonia. Boyle was not involved with the Energy Expo or any other PE4RC activities, and in May of 2010, the Bellows Institute relocated to Oracle, Arizona, and without his impetus, promotion of job creation and re-training were no longer high priorities for the other PE4RC Team members. A few of the successful results of the Team's efforts are described below.

Santa Cruz County Green Building Program introduced

The SCC GBP was modeled after similar programs that had recently been established in adjacent Pima and Cochise Counties. It awards certificates for emerald, gold, silver and bronze levels under a rating system that provides points for home design features along with construction and operational practices under the following categories:

1. Location, Lot Design, Preparation & Development
2. Resource Efficiency
3. Energy Efficiency
4. Water Efficiency
5. Indoor Environmental Quality
6. Operation, Maintenance & Owner Education
7. Innovation

The inclusion of a category specifically for innovation gives SCC building officials wide latitude to award points for new and untested design elements and building techniques. The entire set of standards is a living document which is intended to be updated regularly as innovations implemented by local architects and builders as well as information about new technologies and materials are incorporated into the standards. The latest draft of the GBP Green Building Standards can be downloaded from the SCC Green Building Program of the PE4RC web site.

SSVEC ranked #1 in the U.S. for solar Watts per customer by SEPA

The Solar Electric Power Association's 2009 Utility Solar Rankings (SEPA 2010) recognized SSVEC as the top ranked utility for solar Watts/customer installed in 2009. Although much of the PV installation work that led to this ranking was accomplished before PE4RC began its operations in the fall of 2009, the interactions with SSVEC by members of the SCCF

Renewable Energy Subcommittee and other like-minded individuals in the SSVEC service area definitely contributed to SSVEC's success. A review of SCC building permits identified a total of 47 permits issued for solar or wind energy systems from July 2008 through June 2010. 24 of those permits were issued in October 2009 or later, and 16 of those were for properties located in Elgin, Sonoita and Patagonia. Therefore, PE4RC Team members felt it was important to mention the ranking here, and are just shameless enough to accept partial credit for the accomplishment and include it in this list of results.

SSVEC may not reach #1 in the next SEPA rankings, but the co-op will add to its solar energy portfolio when it builds a 750 kW PV array at the new Sonoita substation. The array is part of the co-op's Sonoita Reliability Project, the plan for which was formally approved by the Arizona Corporation Commission on June 29, 2010. This project includes the 69 kV sub-transmission line across the Babocomari Ranch and through Sonoita. The decision was a disappointment for PE4RC Team members, who opposed the approved alignment of the line along the north boundary of the AWRR.

AWRR awarded grant for two PV arrays

The Research Ranch now has an 8.4 kW photovoltaic array at its headquarters and a 5.0 kW array at the bunkhouse. After an unsuccessful application for a similar grant in 2009, Linda Kennedy submitted an application to the Arizona Department of Commerce's (ADOC) 21st Century Energy Project-Renewable Energy Program for nonprofit organizations in the spring of 2010. The Ranch was subsequently awarded a grant for approximately \$50,000 in matching funds, which when combined with the rebate to be provided by SSVEC through its Sun Watts program made it possible to purchase the PV systems. The original source of funding for the ADOC program was ARRA, the federal stimulus package, which provided \$55.4 million in 2009 for the expansion of Arizona's State Energy Program (see the SEP web site at <http://www.azcommerce.com/Energy/SEP.htm> for more information).

Dr. Kennedy felt it was important for anyone to be able to visualize the amounts of electricity produced by the two new PV arrays at the AWRR, and the design specifications for both systems included the installation of a communications device through which the arrays' production levels could be observed via the Internet. Production data for the arrays is available on the Sunny Portal web site (<http://sunnyportal.com>) by searching the "Publicly available plants" for Plant Name AWRR. There are also links available to go directly to the bunkhouse or headquarters "Plant Profile" pages on the home page of the PE4RC web site, and Figure 7 shows the daily output for the headquarters array in October 2010.

Note that the height of the gray line denoted as "Average yield expectations" in Figure 7 was calculated based on the estimate that electricity would be produced from the arrays at an annual rate of 1,800 kWh/kWp. This means that approximately 1,800 kWh of energy would be generated over a full year for each kilowatt based on the nominal power rating of each array. Given the 215 W rating for each of the 40 panels that comprise the headquarters array and the 24 panels at the bunkhouse, the nominal power ratings for the arrays are 8.6 kWp and 5.16 kWp, respectively. When those specifications were entered into the Sunny Portal configuration for the two arrays, however, the results were 10.0 kWp for the headquarters and 5.6 kWp for the bunkhouse, and those figures are displayed on the Plant Profile pages. The higher

estimates as calculated by the software that powers the Sunny Portal site seem to be borne out by the actual production data, at least for the first six weeks of the arrays' operation.

The Plant Profile pages also indicate that electricity generated by the two arrays will result in a total of 19.8 “tons per annum” of avoided CO₂ emissions. An alternative estimate can be made based on the most recently available emission reduction factors from the U.S. Energy Information Administration (EIA) database, which considers the methane and nitrous oxide emissions as well as transmission and distribution (T&D) losses, and the actual power production data for the AWRR arrays. The EIA-calculated factor for emission reductions including indirect emissions and T&D losses is 0.970 metric tons CO₂e/MWh for Arizona and New Mexico (EIA 2007). Given the initial production-based annual electricity generation estimates of 18.0 MWh for the headquarters and 10.26 MWh for the bunkhouse, using the EIA-supplied factor for emissions avoided, the total may be as high as 27.2 MT of CO₂-equivalent emissions avoided per year!

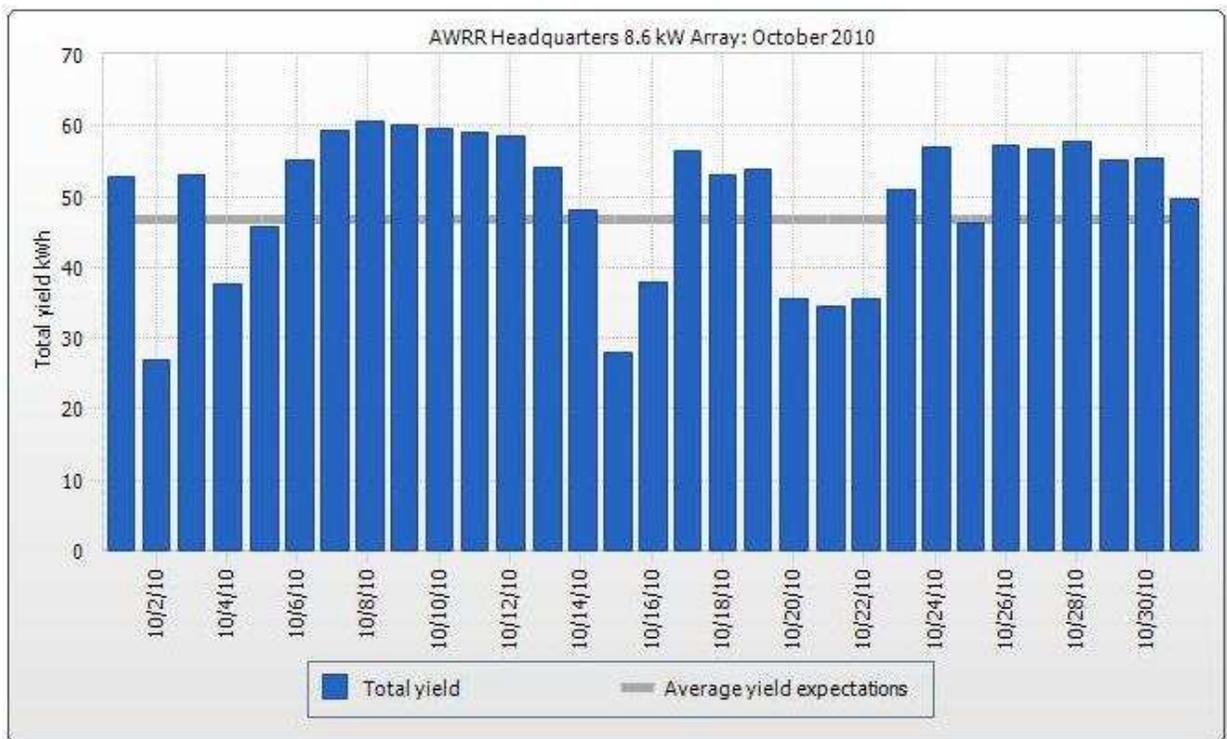


Figure 7. Daily production for the AWRR headquarters PV array in October 2010. Source: Sunny Portal web site (<http://sunnyportal.com>).

Ongoing and uncompleted projects

One of the important objectives included in the plan for PE4RC’s second year of operation is to work with Sonoita and Patagonia businesses and encourage them to implement solar energy systems by providing assistance as a liaison with solar energy design and installation firms and as a finder/facilitator of grants and other funding opportunities. PE4RC Team members have initiated discussions with several Sonoita business owners/operators who are interested in seeing proposals for solar energy systems but presently unable to finance them. The

successful acquisition of grants and/or loan guarantees that lead to the completion of one or more of these projects will be one of the measures of the success of the Team's second year of operation.

Another ongoing project in Sonoita involves the Justice Court building. Keith Barth is the Justice of the Peace for the area and he, with PE4RC's encouragement, has helped to start the process of obtaining a grant to install weatherization upgrades in the building and eventually install a PV array on the roof. SCC Supervisor John Maynard and Director of Development Mary Dahl have been involved in contracting for a formal energy audit of the building and expect to secure a grant to move forward with at least the energy efficiency upgrades for the building in the near future.

PE4RC Team members have established a dialog with the Southeast Arizona Community Action Program (SEACAP), a non-profit organization that provides emergency assistance with mortgage/rent/utility payments to lower income residents, and also with housing repairs and weatherization projects. The Team facilitated a still-underway project to install energy-efficient doors and additional insulation at a home in Patagonia, and intends look for additional opportunities to work with low income residents by providing information and encouraging them to become more energy efficient.

Observations and Recommendations

PE4RC's first year of operation was an intensive learning experience for all involved. The many successes it achieved were recognized by the award of a second year's funding by TogetherGreen. Team members hope that the information provided by this report, particularly the insights pointed out in this section, will allow the organizers of other like-minded initiatives in rural areas to both get started and to benefit from the lessons learned in Santa Cruz County, Arizona.

The primary objective that was specified in the initial grant application was for PE4RC to develop and promulgate a model that could potentially be adapted by members of other rural communities to create their own carbon footprint-reducing initiatives. Recognizing the diversity of geography and climate conditions as well as the demographic variability of rural communities across the U.S., PE4RC Team members acknowledge the difficulty of this task. But by starting with several of the characteristics that are common to virtually all rural areas—low population density and the resulting accessibility of open land, self-reliant community members who respect the land and take a long-term approach to solving problems, and electricity provided by a rural cooperative composed of area residents—a strategy for laying the groundwork and then developing a new or re-purposed organization is presented.

The primary functions of any such organization will include efforts to educate, advise and advocate for changes in three areas:

1. Reducing energy use—conservation by making behavioral changes
2. Increasing energy efficiency by weatherization or other building upgrades or retrofits
3. Implementing renewable energy systems based on locally-available resources

One of the fundamental issues regarding most presently available renewable energy (RE) systems is their high initial cost. For this reason, energy experts recommend that buildings' energy use be minimized before designing and installing an energy system. By using relatively low-cost efficiency upgrades such as adding insulation or dual-pane windows, simple inexpensive replacement devices such as compact fluorescent light bulbs, and even no-cost behavior modifications such as higher thermostat settings in summer and lower settings in winter, home- and business owners can often substantially reduce their electricity consumption. Once a building's energy efficiency has been optimized or at least improved, a properly-sized RE system can be designed and installed to provide it with electricity and/or hot water.

The only pre-requisite for advocating the implementation of RE systems is an understanding of the locally-available energy resources. In much of Arizona, the obvious resource is abundant sunshine. Most other areas also have readily apparent RE resources—if not solar, then wind, falling water, biomass or possibly even geothermal—that are feasible for small-scale (2-10 kW; household size) electricity generation or thermal energy systems. If the locally-available energy sources are not obvious, an excellent resource for visualizing the available geothermal, solar and wind energy resources in the western U.S. is the Renewable Energy Atlas of the West (<http://www.energyatlas.com>). Another is the MapSearch tool, an interactive web-based system developed by the National Renewable Energy Laboratory (<http://www.nrel.gov/gis/mapsearch/>). A more personal source of information about available energy resources is the owner or representative of one of the companies that designs and installs RE systems in a given area. Many of these companies will have exhibits at area home and building shows or at conventions or expos that are more narrowly focused on energy or green building.

Along with an understanding of the locally available RE resources, two other sets of conditions will be extremely valuable to the creator[s] of a new energy-focused organization. First is a set of conditions that can be described as being conducive to creating an energy-focused initiative. Although it would be possible for a single activist to build a new energy organization from scratch, having the additional resources and/or the galvanizing factor[s] to activate other community members is a big plus.

Conditions conducive to forming an energy conservation/efficiency and renewable energy advocacy organization

- At least two enthusiastic community members to spearhead the creation of the organization
- One or more local organizations with roots in the community and experience hosting and/or organizing events as well as communication channels with which to reach area residents
- A galvanizing event or process that is exciting or controversial within the community and arouses widespread interest

A second set of conditions is perhaps equally as important as the first, but will be characterized here as “nice-to-haves”. The affiliation with Audubon was a critical factor for PE4RC because it allowed the initial plan for its creation to qualify for a TogetherGreen Innovation Grant. Most other government or non-governmental organization (NGO) funded grants are available only to established businesses, public entities or other NGOs and not to individuals, so if a new

organization will require outside funding, an affiliation with an established organization may be necessary. The somewhat adversarial relationship with the electricity co-op in the PE4RC study area was definitely a hindrance to its first-year efforts, and Team members will work diligently to improve their rapport with SSVEC in the coming year.

Nice-to-haves

- The support of a national organization (Audubon in the case of PE4RC) which can effectively administer grant funds and provide status and credibility
- A favorable political environment or at least access to a supportive elected official (SCC Supervisor John Maynard for PE4RC Team members)
- A good relationship with the local electricity cooperative/supplier

Challenges

The flip-side of the conditions that are conducive to and nice to have for the creation of a new energy-focused organization is a set of challenges. Some are concerns that all new organizations face, while others are a result of being located in a rural area. For example, reaching out to widely-dispersed rural area residents can be difficult, and using a combination of personal, electronic and media communication channels is advisable. Small turnouts at events you work hard to organize and promote can be frustrating, but can also present opportunities for a more personal level of interaction.

Another challenging issue specific to the energy industry is the ever-changing regulatory environment. The federal tax-based incentives for purchasing renewable energy systems provide a good example. These incentives are necessary to offset the high “sticker prices” of most renewable energy technologies. The 30% investment tax credit available to both individuals and businesses which purchased solar, wind or certain biomass-fueled energy systems expired on December 31, 2008 but was shortly thereafter restored as part of the ARRA stimulus package. It is therefore important to stay current on the available federal and state incentives, and an excellent source is the Database of State Incentives for Renewable Energy at <http://www.dsireusa.org/>.

In addition to the potential uncertainties in terms of financial incentives, there is also a set of technical utility-related, regulatory and legislative roadblocks that seem to be inhibiting the more widespread implementation of renewable energy systems. For example, many states have renewable portfolio standards that require utilities to either purchase or generate a specified portion of their electricity from renewable sources. In Arizona, the Corporation Commission (ACC) established a Renewable Energy Standard (RES) program under which large, investor-owned electric utilities are required to purchase or generate 15% of their electrical load by 2025, and most other western states have similar standards. Rural electric cooperatives can be exempted from the RES, however, if they develop an acceptable plan for incorporating RE into their electricity supplies and submit it to the ACC. Thus SSVEC, under its Renewable Energy Standards and Tariff plan submitted in 2006, is required to provide only 7.5% of its delivered load from RE sources.

Utility-related issues

One of the most significant obstacles to implementing RE systems by rural electric cooperatives is the high cost of installing the new technologies. For example, SSVEC management insists that cheap coal-fired electricity is presently the best option for co-op members. Due to their organizational status as member-owned co-ops, they do not qualify for tax-based state and federal financial incentive programs, but they are eligible for several federal grant programs that provide partial matching funds for some types of projects.

Managers of member-owned utilities are understandably quite conservative about adopting new technologies, and often have staff constraints and limited experience with RE systems. They may also be reluctant to approve plans for third-party designed RE systems and unwilling to negotiate power purchase agreements that would provide an adequate rate of return on the investments required to construct utility-scale RE projects.

Another technological issue which is a concern for both utility company engineers and those who wish to see more widespread adoption of RE systems is the nature of the electricity grid which transmits and distributes power from where it is generated to where it is used. The design of the grid in the U.S. is based on a centralized generation paradigm under which large generating facilities produce power and a network of transmission and distribution lines deliver it to the homes, businesses, industries and other buildings that consume it. The fundamental design of the grid system is for power to flow in one direction, from the generating facilities through high-voltage transmission lines to substations where the voltage levels are stepped down and then through distribution lines and possibly another substation before the voltage is finally stepped down to a level that is suitable for the end user of the electricity. The introduction of relatively small amounts of power into the system from grid-connected sources, which is referred to as distributed generation, has so far not caused any problems. When large numbers of small distributed generation sources on homes and businesses, along with some larger independent power producing sources are added to the mix, however, the grid as it is presently implemented may begin to experience failures. The result of these looming issues is the development of “smart grid” technologies along with research and policy-level discussions about the re-design of the grid under what is being described as the Utility 2.0 model.

A model for creating a carbon footprint-reducing organization

While policymakers, scientists, engineers and utility company executives have begun talking about a model they call Utility 2.0, the final topic in this report is a model that an individual or small group of rural residents might use to establish their own organization dedicated to energy conservation and renewable energy with the ultimate goal of reducing their own community’s carbon footprint. Most of the steps and processes laid out below were used by PE4RC Team members before and during its first year of operation and it is sincerely hoped they will be helpful to you.

Work from within (or become a member of) a locally-based organization that will support your efforts. It’s possible that an allied existing local organization may provide the right vehicle for your goals. Creating or joining a subcommittee within an established organization may provide an effective means to reduce your community’s carbon footprint. If that works, you already have an established group without having to create a new one. A potential drawback with using this approach is that you may find that the established

organization is not as committed to your specific energy-related goals as you are. You will also have less control, and for these reasons it may be necessary to spin off the new energy-focused organization.

Another option is to partner with other, more established organizations. This approach is particularly valuable when planning large events. Joining forces with other local organizations provides more volunteer help when needed, as well as giving access to a broader base of contacts. Networking with other local organizations is also a good way to find and recruit like-minded people to your own organization.

Develop relationships with one or more political leaders. Politicians who are responsive to your work and who support the concepts of green building, energy conservation and renewable energy can open doors and provide insights into governmental tools and procedures that will aid your efforts. Having locally-recognized political figures attend or speak at your events or lend their names to your efforts provides additional credibility and attention to your projects. They may also be able to provide insights about new ordinances or legislation and information on grant opportunities.

Seek out experts. Professionals from renewable energy design/installation companies, academic institutions, NGOs or even utility companies can be a good resource as speakers at organization meetings and community events. Their insights may also help make your outreach efforts more effective and content-rich. As is the case with politicians, energy experts will also add credibility to your efforts and enrich your network of people who are also committed to making a difference.

Capitalize on a galvanizing issue. People tend to respond to a specific experience, opportunity or threat. If there are any controversial issues that like-minded community members can rally around, they may be more inclined to assimilate new information and motivated to make changes. If there is no presently relevant attention-grabbing event or divisive issue in your area, consider creating a competition, perhaps analogous to a United Way fund drive but using energy savings or efficiency investments as the measure of progress, or some other community-focused project as an approach to generating enthusiasm for reducing the community's carbon footprint.

Even if there is a local dispute or issue that helps jump-start your organization, a potential challenge that may occur for you is that when the controversy is solved or simply subsides over time to the "back burner," the interest in your new organization may also begin to wane. Consider these times to be opportunities to relax and rejuvenate yourself from the periods of more intensive effort leading up to your events and to have the time to brainstorm and better plan and prepare for whatever comes next.

Organize local events. Planned annual events such as an energy expo or tour of green-built/renewable energy-equipped homes in the area can create some grassroots support for achieving your goals. The "show not tell" approach that these events provide can generate enthusiasm and expand community members' knowledge and understanding of renewable energy and the financial and environmental benefits of energy conservation investments. These events also facilitate the involvement of multiple people, area businesses and other

organizations. Consider involving even non-related groups such as local churches and schools to connect the event to the entire community. Other smaller events such as seminars and hands-on workshops can also work well, particularly if you have an effective network of people who can personally get the word out to drive attendance.

Identify funding opportunities. Many local organizations offer small grants or seed money for projects that benefit the community. National and international organizations also have grants that focus on rural communities. If you have no experience with grant-writing, see if you can find help in the community from an NGO or other resource. If a corporation has a strong presence in the area, it could be a good resource for funding and interested in promoting its own efforts to conserve energy and other resources. Large retailers such as Wal-Mart, Target, Home Depot and Staples are known for supporting efforts by community-based organizations. The local electricity co-op may also be willing to partner with your organization—by promoting your efforts or providing some resources to aid your projects. You may be able to take part in other community fund-raising projects that could also add to your coffers. A major event such as an energy expo can be utilized as a funding opportunity.

Recruit locally-available volunteer talent. You can't do it all by yourself, and you shouldn't try. Reach out to your own network of contacts and to others through your organizational affiliations. Make efforts to locate and recruit volunteers who complement your own skills and add depth to your team. Running an organization, maintaining outreach efforts and hosting



Figure 8. PE4RC Team members Rob and Jeanne Horsmann (left and center) along with water harvesting guru Brad Lancaster.

events is exhausting and time-consuming. Most people don't have the luxury of working on projects such as this full-time. The better your team, the better job your organization will do, and the more likely it is to last. It's never too early to think in terms of delegating responsibilities and developing a succession plan for every key member of your organization. Your goals will not be met in a day or a year, and you must plan for the future.

Conclusions

What has been described here as "the first year of PE4RC's operation" was actually the culmination of many hours of earlier work over a period of many months by Linda Kennedy, Jeanne and Rob Horsmann, Gail Getzwiller and many other rural Santa Cruz County residents. The TogetherGreen grant that allowed them to bring in a research fellow to help with their education and outreach efforts and document and describe their new organization was an early positive indicator about its potential. Looking back at what was accomplished during that first formal year, all of the Team members believe it was a satisfactory beginning and that some good progress toward the goal of substantially reducing the area's carbon footprint was achieved.

The Team also acknowledges its limitations and recognizes the areas where improvements can be made. The decline in Energy Expo attendance and overall low community participation rates at PE4RC events were probably unavoidable and will be taken into account as plans for the next year's events and other activities are planned. The adversarial relationship with SSVEC was an issue, but following the ACC decision to allow the co-op to proceed with construction of its 69 kV line across the Babocomari Ranch, PE4RC Team members hope to improve their rapport with the co-op's public relations staff and cooperate more toward achieving common objectives. Finally, given the stated preference by survey respondents in the study area about using web-based tools, Team members plan to increase the level of interaction among community members using the PE4RC web site.

The award of a second year of funding from TogetherGreen was a huge confidence builder for the members of the PE4RC Team, and they recognize that much remains to be done, both in Santa Cruz County and across the U.S. They are proud of their efforts and contributions, and hope that activists in other rural communities can become inspired by and benefit from their experiences.

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Appendix—Six Year Strategic Plan

Encouraging Use of Alternative Energy: A Model for Rural Communities
Northeastern Santa Cruz County, Arizona
Final Draft
Six Year Strategic Plan
April 2010

Vision Statement: Northeastern Santa Cruz County 2016

Geographic Description: Northeastern Santa Cruz County, Arizona is a beautiful, high altitude, arid grassland punctuated by picturesque mountain ranges called “Sky Islands” because of their unique biological diversity. Sunshine is plentiful and climate agreeable. The towns of Sonoita and Patagonia are bustling nodes of commerce. Traditional land use was ranching, encouraged through large land grants from Mexico and Spain when the area was under the Mexican flag. Now, “ranchettes” cover much of the unincorporated areas between Sonoita and Patagonia.

Demographics: In 2016-2020, population in this rural area is around _____ persons in households with a population growth rate in the past five years of about _____% net increase per year. There is a strong Hispanic community with many families long-time residents of the area. Retirees from far places are attracted to the area.

Alternative energy: In 2016, hundreds of households supply their own electricity used primarily on site, with excess fed into the energy grid for use by others. Local “clean” generating systems have successfully lessened carbon emissions, reduced the amount of water needed for traditional electricity generation and reduced peak period surges— incidents which, in the past, encouraged traditional local utilities to desire to overbuild their infrastructure and transmission lines.

Energy usage and costs: Energy usage has been reduced due to many residents having adopted energy efficiency options including retrofitted insulation, energy efficient appliances, solar water heaters, energy efficient windows and other mitigation techniques. Local residents have lowered their energy costs per year since August 2009.

Residents’ energy efficiency actions: In 2013, 25% of households in the pilot zone committed to a) install systems that produce at least 2kW each or b) significantly reduce their energy consumption (and their costs) through energy efficiency measures. These residents, businesses and organizations signed Energy Agreements. In 2014, the community and the local utility agreed on a measurable to assess energy demand and cost over time; this agreement was a major breakthrough and significant milestone toward achieving the vision. The project, dubbed “Practical Energy for Rural Communities in Arizona” began to be studied as a model for rural areas.

Total energy demand: By 2016-2020, residents and businesses for the first time actually reduced total demand on energy derived from coal. This milestone was celebrated at the Annual Energy Expo with awards given to key volunteers and community leaders.

Community communications: Residents are in contact with one another through modern technological means and because they have had shared experiences in developing sound conservation practices. In 2012, the start up website provided through Arizona State University became a full-fledged website. It receives 2000 “hits” per year and is a major tool for publicizing information to the community.

Community leadership: The National Audubon Society’s Appleton-Whittell Research Ranch in Elgin, Arizona, provided key start up support six years ago to a community-wide effort to reduce energy consumption. Other partners at that time were many locally-based, conservation-minded groups, businesses and individuals, Sonoita Crossroads Community Forum, Arizona State University, Cienega Watershed Partnership, the US Department of Agriculture and the local Congressional Representative’s office. The first Energy Summit in NE Santa Cruz County occurred in December 2009.

Sonoita Crossroads Community Forum and National Audubon Society: In 2012, Sonoita Crossroads Community Forum (SCCF), a 501c3 nonprofit neighborhood development organization and National Audubon Society’s Appleton-Whittell Research Ranch formally announced formation of “Renewable Energy Initiative, Inc. (REII)” a new nonprofit whose mission is to mobilize the community toward energy savings. This group is now considered by many to be the “keeper of the vision”; it has developed access to private and public sector credit so that it can offer loans to retrofit commercial and residential buildings. The Pilot Phase of “Practical Energy for Rural Counties in Arizona” final report is in preparation; REII will present it to the Santa Cruz County Commissioners with a recommendation to expand the effort to other parts of the County.

Renewable Energy Initiative staffing: REII staff includes a FT coordinator and a new PT support person. The Board consists of five community representatives dedicated to achieving the vision and promoting the activities of the organization. REII recently dedicated its new office location in Sonoita, receiving good local media coverage and a comprehensive article about its efforts over the past five years in the Tucson *Daily Star*.

Most important accomplishments: When interviewed for the news article, REII’s Boardmembers and staff said they are most proud of: a) public policies--“green building” codes—mostly now in place to promote energy efficiency in renovations and new construction in the Pilot Phase area; b) a formal partnership being crafted with the local utility/co-operative that supports REII and the emphasis on energy diversification and efficiency; c) the yearly Energy Expo that has grown each year in size and scope; d) new partnerships with private and public sector entities which train and educate residents and young people to work in new energy fields; f) the County Courthouse renovation project which exhibits a strong public/private partnership and, when completed, will model an energy efficient retrofit; g) the extent to which REII’s education and outreach efforts have resulted in actual, measurable positive changes in the way all sectors in the community purchase and generate power and h) the successful setting up of the REII organization’s staff and office signifying local capacity for carrying on the work.

Strategic Plan Timetable

Year I:	August 2009 – July 2010 (Start Up-Appleton/Whittell Ranch
Year II:	August 2010 – July 2011 (Start Up-Appleton/Whittell Ranch
Years III-IV:	August 2011 – July 2013 (Begin Implementation--REII)
Year V:	August 2013 – July 2014
Year VI:	August 2014 – July 2016

Backgrounding: Research, Surveys and “SWOT” analysis

In 2009-2010, the Appleton-Whittell Research Ranch, armed with a grant from the Together Green initiative, engaged a research fellow to survey residents in Santa Cruz County about their energy usage and conservation interests (See attached spreadsheets). And, in March 2010, the Energy Expo III took place in Sonoita, staffed entirely by volunteers headed up by Jeanne Horsmann with assistance from Rob Horsmann and Linda Kennedy. From the surveys, conversations and input from the attendees at the Expo, the developing project documented important and intriguing opportunities.

MARKET: First, from conversations at the Expo and from surveys, there are folks that are ready to adapt energy efficiency measures. They may be identified as the “early adapters”. This group of about 200 persons constitutes the potential market for start up of the project.

WEATHERIZATION AND RETROFITTING: The survey highlighted the kinds of measures that folks are interested in adapting. Solar powered hot water heaters, photovoltaic arrays and wind power topped the list. In addition, weatherization and retrofitting for energy savings were popular ideas.

BARRIERS: The stated barriers to independent individual residents’ adaptation are several. Of the persons in some measure ready to make these changes, there are several hesitations (See survey spreadsheets attached). While not all reasons might be surmountable, some could be dealt with by the project, such as: “I do not have time to do the research”; “if someone would help me assess what I need and help me implement it” and “I need to learn more about _____”.

BUSINESSES: More problematic reasons relate to cost, affordability, access to capital and the long waiting list for rebates at the local utility/coop (which has since suspended the rebate program to great consternation of the project group). Despite these barriers, at least four businesses stated would be interested in adding energy efficiency devices to their buildings. These interested businesses are: Sonoita Hardware, Fuel Stop, Duquesne House (a Patagonia B&B) and the Sonoita Fairgrounds.

OPPORTUNITIES OR “SHOW ME” EARLY PROJECTS: The four businesses noted above are potential early projects, the all-important “show me’s” that start ups need.

OPPORTUNITIES: There are existing tools that could be brought to bear in NE Santa Cruz County through various agencies like the USDA and IRS (tax credits)—again, an opportunity. The effort to bring these resources in meaningful ways to the County would likely include grant writing and advocacy as well as technical advice and general project management for residents and businesses. Should currently existing tools not be enough incentive for key projects and expensive retrofitting, tackling these barriers will take a specific, focused, longer-term effort over time to develop new ways to support a decrease in fossil-fueled energy consumption.

MARKET APPEARS TO BE SUPPORTED: The idea of the project has merit to a growing group of people and a small, but potentially growing market for actual changes has emerged.

INTERNAL ASSESSMENT: How can the project begin to provide services to individual businesses and residents that, over time, help the community to realize the vision?

The planning group assessed its capacities, applying a realistic yardstick about their enthusiasm, their expertise, their capacity and the likelihood of success. They also evaluated where the project ultimately needs to be housed (which entity is the “keeper of the vision” or the community “driver”?) Does the project use existing organizations and continue to use volunteers to implement the project? Does the project become its own entity with its own fire in the belly?

CAPACITY, THE LARGEST CHALLENGE: The project group concluded that the project’s ambitious first blush plan needs to be reexamined. They recommended that the Strategic Plan have a longer time frame: six to ten years.

TWO EXISTING ORGANIZATIONS, CAN THEY DO THE JOB? The project team concluded that neither of the two existing organizations in Sonoita, nor government (County) nor a continuing use of volunteers alone present viable options for achieving the vision.

Sonoita Crossroads Community Forum is very supportive of the project but lacks capacity to perform the specific functions needed to achieve the vision. Their focus is development, more broadly defined, in the Sonoita area. They are, as their name implies, a “table” around which community activists discuss development items. In addition, due to timing and circumstances beyond the control or knowledge of the project team, many of this organization’s boardmembers and supporters are engaged in community advocacy with large institutions and governments. This advocacy, rightly, takes their time and energy in Year I of the project.

The Audubon Appleton-Whittell Research Ranch, as a spark plug for start up, cannot carry out the functions that would be called for as it has its own vision and mission within the Audubon family. Like the SCCF, through Ms. Kennedy, it and Audubon can remain involved and supportive but cannot be the direct implementing entity.

Dedicated volunteers are needed for all projects which seek to make change—folks who believe and then are able and willing to donate time, energy and their own resourcefulness to “make things happen.” For this project, the “first in” volunteers have contributed so many hours and so much effort that burn out is beginning to appear (see attachment for volunteers’ hours on just the 2010 Energy Expo alone; Jeanne Horsmann’s hours alone were approximately 300...).

“STAFFING”: The planning group, which includes these volunteers, concluded that it is time to staff the Expo with a paid person. Second, they concluded that a project management person on contract could be helpful as well. Volunteering at the high level demanded cannot continue as it takes too much energy and effort, not to mention time, away from businesses and families. If these founders had their druthers, they would bump themselves into policy and decision-making roles...for example, into a board of directors setting.

NEW NONPROFIT ORGANIZATION? Because none of the existing organizations can take on this new mission, the formation of a new nonprofit group may be advisable. Probably timing for this would be 2-3 years into the project.

ORGANIZING A LEADERSHIP GROUP: Most important is organizing the folks in the community into action; that effort alone will likely occupy a majority of the founders’ energy in Year II of the plan.

Strategies, goals and objectives:

This section of the plan articulates the primary strategic objectives of the vision, then elaborates on the steps required mostly in Year I through Year II of the plan to begin to implement the strategic objectives.

Introduction: To realize the vision in the next six to ten years, the project must focus its energies on three items in **Year II: Community Organizing, Energy Expo IV and rudimentary project management for energy-saving projects with businesses in the Sonoita and Patagonia area.**

Community Organizing

It is essential that the project, in Year II, focus on re-energizing its community base. Capacity in a community is only built upon the energy, focus and enthusiasm of the advocates in favor of a change. Thus, Year II of the project must include, as a primary

work item, the re-organizing of and expansion of the core group of energy advocates in Northwestern Santa Cruz County.

It is further recommended that this advocacy is best accomplished by the founders and not by a paid consultant, contractor or staff person. Should the project engage one or more consultants or contract persons for the other two important tasks in Year I, one of these folks could provide some support to the founders for this task.

Year II

By Winter 2011, the founders will have spoken with several persons in the Sonoita/Patagonia area to advocate for the project and assess these persons interest in the long term vision.

By April 2011, at least one meeting of the interested persons will have taken place to develop the Year III plan in detail.

Energy Expo IV

Introduction: Spreading the word through actual completion of projects is required to realize a strategic vision and is the most important “first step” for any start up effort. Thus the Energy Expo and Project Implementation are linked directly year by year for this project.

The Energy Expo is the primary and, importantly, the already-tested means of marketing the project. It shows off practical ideas for implementation. It attracts persons who have developed an interest in the marketplace and share with the project that they have an interest.

Project Implementation is the act of directly and actively with intent providing technical and project management assistance to those persons which result in completed projects.

Some projects will be easier to implement. Others will be more difficult, requiring staffed project management focus to take advantage of energy programs that might be offered by government and utilities. Some projects will require new tools which is where the new nonprofit comes into play in later Years of the plan; with its focus, documentation of needs in the marketplace, it can be positioned to develop new programs which meet these needs.

ENERGY EXPO III: Preliminary reports already show that the Expo in 2010 was successful. The event reached over 200 people and resulted in more vendors. In fact, several happy vendors were able to market their products to potentially willing buyers. The project raised over \$3000 in cash and over \$6000 in total underwriting and ended up with a net fund balance of \$600-\$800 (compared to \$200 remaining from the 2009’s Energy Expo II).

The group was able to land several key grants—from the Patagonia Community Foundation (\$1200), from WalMart (\$500) and from the utility/coop SSVEC (\$500)—in support of the Expo. The volunteers developed effective marketing tools to promote the event. Importantly, the Expo experience complemented the project survey that was conducted on-line and on paper, resulting in the project gaining the names, addresses, phone numbers and e mail addresses of about 70 additional persons interested in energy efficiency, energy retrofitting and other project-related actions. (from Jeanne Horsmann's records)

Year I: By May 2010

Report Deliverable: the project will have provided final reports for its own purposes outlining the results of the 2010 Expo. These reports will include financial reports and an assessment of the positives and negatives of the Expo. (Wayne Porter assisting Jeanne Horsmann)

Recommendation Deliverable: These reports will recommend potential projects with businesses (4 possibilities) or with residents (with names) that, using existing tools and potentially including project management and advocacy with the programs researched, could result in 6-10 projects implemented AS A RESULT OF the project in Year II-Year III. (Wayne Porter draft for Project team)

By November 2010

Plan Deliverable: Decide date, venue, market (part of Santa Cruz County or all of Santa Cruz County, two venues??, etc) and preliminary budget for Energy Expo IV (Project team)

Year II

By October 2010, assuming appropriate funding is in place, bring on board a contract worker to organize the Energy Expo for 2011.

Energy Expo Plan Implementation Deliverable: Plan Fourth Energy Expo, completed by six months' prior to date of event. Engage an event coordinator on contract. Develop a plan for recruiting volunteer assistance for the Expo. Develop a marketing plan built upon successes from prior years. Make grant and underwriting applications as required by the plan. (Project coordinator, strategic planning consultant, project team)

Energy Expo Implementation Deliverable: Deliver the Energy Expo IV with expanded outreach and expanded numbers of vendors (aim for a modest increase in numbers of vendors) from Energy Expo III. Develop new and updated mailing/contact list of persons interested in energy efficiency improvements to homes and businesses, weatherization and retrofits. (Event Coordinator on contract and corps of volunteers)

Project Scheduling Deliverable: Develop a list of about a dozen (12) potential projects that could be implemented in Year III/IV should the appropriate capacity be in place.

By July 2011

Project Planning Deliverables: By July 2011, contact will have been made with at least some of the potential projects recommended in the Expo report. For example, from the surveys, 19 people declared an interest in purchasing Hot Water Solar. Each potential project will be scoped for any that can be implemented in Years which succeed the Yearly Energy Expo (mere purchase of a simple installation or new appliances). Document in brief form the assessment of what is needed to get these projects completed; this will form part of the basis for the work plan of the Year III contracted project coordinator for those projects not completed by end of Year II.

Longer Term Project Planning Deliverable: By July 2011, identify at least six (6) projects with a longer time horizon a) where using existing funding tools is possible but requires applications, etc. and b) those, most probably businesses, which are more complex and for which there are no currently existing, appropriate funding or financing tools for implementation. For example, another 19 people from the surveys declared an interest in Photovoltaic. Several others indicated interest in weatherization and retrofits of various kinds. Document in brief form the assessment of what is needed to get these projects completed; this will form part of the basis for the work plan of the Year II contracted project coordinators. (Wayne Porter draft for Project Team)

Project Capacity

The Start Up Phase: NAS/Appleton Ranch “parents” project team for three years using Together Green grants, other grants that might be available and its current staff. The Ranch/NAS contracts with the following expertise in **Year II** to complete the following tasks:

ENERGY EXPO IV COORDINATOR (250 hours @ 15.00 per hour, November 2010 – February 2011 = \$3750.00. This person organizes volunteers, arranges for the vendors and the venue, helps the project team raise funds from contributors and sponsors, arranges the programs, helps develop PR and advertising and implements the Expo (direction and mentoring from Jeanne Horsmann, with project team)

PROJECT CONSULTANT (100 hours @ \$30.00 per hour = \$3000.00. This contract person will be brought on board between December 2010 and February. He/she will be responsible for implementation of projects at homes and businesses that reduce energy usage and, most important, energy costs. Project coordinator will also be asked to provide support to the project team to assist with organizing tasks.

Personnel: Project Directors: Jeanne Horsmann and Dr. Linda Kennedy, NAS Appleton-Whittell Research Ranch, Project team members: Rob Horsmann, Wayne Porter (Research Fellow) and Karen LaFrance (strategic planning consultant).

Year I

Grant Writing Deliverable: May 7, 2010, complete application to Together Green Innovation Grant opportunity for “Year II Start Up Funding”; Linda Kennedy with assistance from Karen LaFrance, strategic planning consultant.

Proposed Together Green Innovation Grant Budget 2010-2011

Element	Amount
ENERGY EXPO IV Coordinator (NAS Contract)	3,750
PROJECT CONSULTANT (NAS Contract)	3,000
Contract Management & local OH, NAS Appleton-Whittell Research Ranch	5,000
Strategic Planning Consultant (NAS Contract)	3,000
Website Development	1,500
Energy Expo IV Reimbursable Expenses	1,400
TOTAL GRANT REQUEST:	17,650

ENERGY EXPO Coordinator Work Plan: Drafted by July 2010 (Strategic Planning consultant for Project team)

Grants: Fall 2010, develop proposal for Southern Arizona Community Foundation to help fund or underwrite the Energy Expo....

Strategic Plan Deliverable: Draft strategic plan completed by April 12, 2010 (strategic planning consultant), reviewed by project team (Jeanne and Rob Horsmann and Linda Kennedy, others) by April 29, 2010 and put into final form by May 6, 2010.

Strategic Planning Deliverable: Organizing Sonoita Community by May 2011.

Year II: Contract Coordinator Deliverables (See above)

Year III Deliverable: On or before July 2012, complete concept plan for forming a Renewable Energy Initiative, Inc. nonprofit organization (REII). Decide corporate name, develop by laws, articles of incorporation, complete application to AZ Corporation Commission to incorporate and file 1023 application to the IRS for Tax Exempt Status. (strategic planning consultant Karen LaFrance with Project Team).

Other Initiatives

PUBLIC POLICY

Green Building Codes, adapted in Santa Cruz County, would move construction of new residential land uses toward more energy efficiency. Education and Advocacy is needed as well as research on other communities which have such codes.

Year I

By July 2010:

Research Deliverable: the project will gather information about existing codes in Tucson and other Arizona locales. (Wayne Porter and Jeanne Horsmann)

Year II-Year III

Partnerships Deliverable: the project team will have met with the Contractors' group to discuss the idea of a green building code.

Advocacy Deliverable: the project team will have had one meeting about implementing a green building code with at least one member of the Santa Cruz County Board of Supervisors and with appropriate County staff. WHO??

Advocacy Deliverable: deliver case statement, as appropriate, and organize for appropriate advocacy toward implementation of a green building code for Santa Cruz County. Whether or not such a policy is adopted is not in the control of the project; however, a successful policy advocacy campaign IS within the control of the project. Given the vision, this campaign should be implemented in Year III so that the effects can begin to be felt in new construction and retrofits by Years V-VI of the plan. (REII)

RE-TRAINING RESIDENTS AND YOUNG PEOPLE TO WORK IN NEW ENERGY FIELDS

Year I

Partnerships Deliverable: Complete research on what organizations, NGO's, governmental groups, contractor groups, educational institutions, school districts and others need to be involved. (Project team)

Year II-Year III

Implementation Deliverable: Complete plan for a comprehensive NE Santa Cruz and/or county-wide energy training and re-training initiative (REII)

COUNTY COURT HOUSE AS A MODEL RETROFIT

Year II-Year III

Recruitment Deliverable: By July 2012, determine what persons and groups, if any, would be interested in a green energy retrofit and historic restoration of this building in Sonoita (Project team)

Project Scope Deliverable: none

Partnerships Deliverable: see above

Project Grant Writing Services Deliverable: to be determined

Year IV –Year VI

Project Scope Deliverable: Completed (need Project Coordinator)

EDUCATION, OUTREACH (“KEEPING THE BUZZ GOING”) AND ENGAGEMENT

Year I

Powerpoint Presentation Deliverable: By May 2010, load onto the website a PPT presentation, derived from a display at the Energy Expo which depicts the energy retrofits of several residents’ homes along with other educational materials and photos. (Wayne Porter)

Survey Results Deliverable: Final Report on Survey #1 and Survey #2 by July 2010. Provide conclusions; use these in the Case Statement. (Wayne Porter)

Project Case Statement Deliverable: By June 2010, draft case statement completed for project team and final completed by July 2010 (Wayne Porter for Project team)

Outreach Deliverable: By April 2010, attend several local gatherings to promote the project and energy efficiency in Nogales (Rotary, April 22) and Sierra Vista. (Wayne, Ron, Jeanne and Linda, others??)

Tour Deliverable: On May 15 and 22, 2010, organize two house tours, one in Patagonia and one in the Sonoita area (size and scope to be determined) of the above-mentioned and advertised energy efficient homes. If feasible, complete this tour for

specific audience(s). These could be from potential partner organizations, educational institutions, businesses or contractors who provided the retrofits, government and/or amongst interested individuals whose names appear on the lists generated from the surveys and the Energy Expo (Wayne Porter, reporting to the Project Team)

Workshop Deliverable (OPTIONAL): By July 2010, organize, develop sponsorships for (if possible), schedule and implement at least one workshop on energy efficiency, “Solar Power 101”, EnergyStar appliances, “off the grid” techniques for saving energy and money, weatherization, Hot Water Solar and Photovoltaic installations. Include info on Water Harvesting Systems and Water for Wildlife (these have popularity as shown in the surveys) in the program and invite potential partnering entities to present (see Partnerships Deliverable above) (Wayne Porter to draft plan for project team and implement this workshop under direction of Jeanne Horsmann)

Year II

Education Task Force Deliverables: By April 2011, determine who should be asked to serve on this committee, starting with review of the notes from the Energy Summit 2009. By July 2011, conduct at least the first meeting of this group (plan with Karen LaFrance, strategic planning consultant). At this meeting, review notes of ideas from Energy Summit. Determine priorities for outreach and engagement with schools in Santa Cruz County, from private schools to public schools, from early grades through secondary schools. Determine how to use energy pledge for adults and through adult outreach, education and learning. Begin recruitment of School Principals, School Board members, Educators and youth. Determine outreach materials needed (some of which have already been developed and printed for use at the Expo) and who is going to do follow up from outreach initiatives. Determine role(s) for major partnering organizations include state and local elected officials, federal elected officials, state and local programs, utility/coop, universities, community colleges and trade schools, etc. Determine the plan for Year II staffing, the implementation of which will become part of the Work Plan for the contract coordinator at REII. Decide when to hold Energy Summit V (one year anniversary would be December 2011); plan this meeting around evaluating strategic goals from Energy Summit III and IV, reports from Project team and strategic partnerships needed for implementation....(Project team)

Funding and Financing Energy Retrofits Deliverable: By April 2011, complete an inventory of the tools that are available to residents and businesses in NE Santa Cruz County to fund, finance and encourage energy efficiency measures. Begin the analysis of what additional tools, such as new financing mechanisms, which might be needed over time to meet the financial needs of businesses and residents who are interested in retrofits. (Karen with Project team)

Partnerships Deliverables: By July 2011, determine what partnerships are needed to effect usage of existing tools. Determine what the local utility/coop can and cannot do to assist (SSVEC), the state of Arizona and Federal agencies and in what years. By July 2010, meet with or contact key persons in these agencies and institutions. Using the idea

of engaging these key persons to impart expertise to residents as a way to bring them into the project, invite them to participate in at least one informational Workshop on retrofitting, water harvesting and other energy savings (Project team)

Year III – Year IV

Energy Summit II Deliverables: evaluate strategic goals from Energy Summit I, review reports from Project team on Energy Expo and Project Implementation, development of new nonprofit, reports from the Education Task Force and discuss strategic partnerships needed for implementation. Discuss also research needed to determine long term evaluation goals as to measuring energy usage and costs over time. Hold this meeting by December 2012 while beginning to establish a culture of positive planning with the community.... (Project team with strategic planning facilitator Karen LaFrance)

Education Task Force Deliverables: Implement plan to reach out and engage through educational means residents and businesses in NE Santa Cruz County. REII with Project Coordinator)

SUSTAINABILITY

How do we fund this initiative in years 3-6?

Other Grants...

Local Fund Raising/REII dues and contributions?? etc.

Potential for Energy Expo to generate revenue year by year....

What it will take....under full operation, year III – V??

Fund local organizing staff

Locally-raised money is the most flexible....

Fund office in year V and, potentially, add PT support staff

Sustainable Sources of Income: Contracts, fees, earnings/underwriting from website; potential for lending for retrofits and investments in renewable energy products