Solar Master Plan

BERKELEY UNIFIED SCHOOL DISTRICT (BUSD)

Chapter 9

Going Solar at San Ramon Valley Unified School District: How a Small Idea Energized an Entire School Community (Case Study)

Going Solar at San Ramon Valley Unified School District: How a Small Idea Energized an Entire School Community (Case Study)

The preceding chapters in this Solar Master Plan describe many of the technical and financial issues a district must consider when exploring the possibility of purchasing and installing renewable energy systems. This chapter is dedicated to all the students and their communities who are encouraging their school districts to make the shift to renewable energy.

Julia Mason, a former student at Monte Vista High School, Danville CA, drafted this "case study" in 2010. Her intent was to memorialize her community's efforts to encourage the San Ramon Valley USD school board to purchase renewable energy systems for its schools. She hoped that the case study would show students and community members around the state that it is possible for a school community to play a positive role in helping their districts "go solar."

The case study also includes a Frequently Asked Questions (FAQ) document that Julia, her family, and KyotoUSA prepared in 2009 when the district was beginning to consider seriously purchasing a solar system. The FAQ was distributed at community gatherings and school board meetings to address questions that were frequently raised about the transition to renewable energy. The FAQ document was helpful in informing the community about the benefits of solar and dispelled many misunderstandings about the project.

San Ramon Valley Unified School District installed 3.3 MW of solar panels at five sites (four high schools and a middle school) in the summer of 2011. The PV systems are expected to provide a new revenue stream for the District's General Fund.

Going Solar at San Ramon Valley Unified School District: How a Small Idea Energized an Entire School Community

In spring 2008, a student at Monte Vista High School in the San Ramon Valley Unified School District (SRVUSD) approached KyotoUSA (an all volunteer organization) with the hope of installing solar panels on her high school. Two years later, in May 2010, the SRVUSD school board unanimously approved an even more encompassing plan: a 3.3 Megawatt (MW), $23 million project to install solar on six campuses in the District. The project is financed with U.S. government-backed, low-interest Qualified School Construction Bonds (QSCBs) and will be repaid from the District's energy savings. Ground-breaking will take place in spring 2011.

The Idea Begins

In early 2008, Monte Vista High School (MVHS) junior Julia Mason and her family began thinking about initiating a project to install solar panels at MVHS , inspired by their concerns about global warming, increasing gas prices, huge profits reported by multi-national energy companies, and school budget cuts. They researched several other California school districts, including San Jose and San Diego Unified School Districts, that had gone solar using a form of financing called a Power Purchase Agreement (PPA). Their initial plan was to seek grant support for the high school project from Chevron Energy Solutions, whose parent company, Chevron, is headquartered within the school District. This idea was eventually abandoned in favor of proposing a larger scale project using low-interest bond financing that would allow the District to own the photovoltaic (PV) systems and accrue all the economic, educational, and environmental benefits generated by the PV systems.

Julia formed a student group and researched and contacted organizations dedicated to helping school districts install solar. Tom Kelly from Berkeley's KyotoUSA immediately responded with enthusiasm and encouragement, offering to help find financing sources and vendors. KyotoUSA had just concluded a successful pilot project for a 100 kilowatt (kW) photovoltaic system (PV) at Washington Elementary in the Berkeley Unified School District. Tom was happy to help share what they had learned in that effort, called the HELiOS Project (**H**elios **E**nergy **Li**ghts **O**ur **S**chools). KyotoUSA's quick and enthusiastic response gave the students a sense that their idea was indeed worthwhile and inspired greater energy: the project now seemed possible.

MVHS teachers and her school's administration responded positively to Julia's request for their support and input, and were encouraging from the outset. Nevertheless, they had little influence with District administrators because construction and facilities projects are handled at the district level. Other stakeholders in the District had to be identified and presented with the concept. Julia and her team got to work.

Persuading the District

In Julia and Tom's first communications and meetings with District officials in April and May 2008, the District staff listened but were reluctant to move forward, especially with a project that appeared to have such high upfront costs during a period of economic uncertainty. The District was also wary because it was aware that some public school solar projects that used private financing (PPAs) had not always lived up to their promise. The District emphasized that, at a minimum, it had to be certain that the project would break even financially (energy savings = repayment costs) before considering undertaking such a major project.

Through the summer and fall of 2008 and the spring of 2009, Tom and Julia met with District facilities staff, who thought the solar project was a good idea and, in fact, had unsuccessfully advocated for solar in the past. Solar vendor Eshone Energy came to inspect the MVHS roofs and generated a proposal for a 1MW system that would cost $7 million ($5 million after the California Solar Initiative rebates). Although the proposal was estimated to pay for itself after 14 years and generate $14.5 million in savings over a 25-year period, the District found the upfront costs too high, especially in the face of the economic downturn. Nevertheless, Tom continued to correspond with District staff throughout the spring of 2009, fine-tuning the project, suggesting that the District use available modernization funds from the Office of Public School Construction to help underwrite the cost of the project. Although his estimates showed positive cash-balances, the District's continued response was that it was not pursuing any new projects. At times, it was difficult to maintain the attention of the District, especially in the summer of 2008 when the District was hiring a new superintendent and dealing with pressing District concerns that always occur at the start of a new school year.

In July 2009, Tom approached District officials with information about Qualified School Construction Bonds (QSCBs) - low interest bonds issued as part of the American Reconstruction and Recovery Act intended to make low cost financing available for public school construction projects. While the District earlier had expressed interest in the Clean Renewable Energy Bonds (CREBs), it was unable to make the deadline for requesting a CREBs allocation. In hopes of making the later QSCB deadline, Tom communicated with the District about the possibility of using QSCBs for solar, and assisted the District in getting help in completing an application.

The District was one of a handful of school districts that received an allocation of $25 million in QSCBs. QSCBs represent a powerful solution for solar for schools because unlike other construction projects, solar panels actually help to pay for themselves: the savings from electricity costs and rebates would be used to pay back the bonds. Not only would the District benefit from low interest rates and rebates, but each year the money from energy savings could be put aside and invested, thus gaining interest and allowing the District to actually pay back less than it borrowed.

The Board Acts Cautiously

In early October 2009, the school board discussed the possibility of using its $25 million allocation of QSCB bonds for solar. In the days prior to the meeting, Julia e-mailed the board members and Superintendent, explaining the benefits of solar and its importance to the student body. The board was open to the idea of solar but wanted more certainty and more information. One problem that arose was that although the bonds were intended to be interest-free (the federal government paid the interest to the investor), there was only one company willing to buy the bonds, and this company wanted a 0.75-1% premium over and above the interest the government was prepared to pay. Although this was still “cheap money,” the board was hesitant to consider anything that would put the District into greater deficit. Also, there were proposals from the community for other types of construction projects including new bleachers and a new swimming pool, expansion of the District bandwidth, and other facilities improvements. The board eventually ruled out these types of projects because none of them would generate the revenue necessary to pay off the bonds. Furthermore, the board needed to use the bonds for “shovel-ready” projects because 10% of the funding would have to be spent within the first six months. Concerns were raised about how the community would react to the aesthetics of the solar panels; the board members agreed that they needed more input from the community, more time, and more certainty that the financing would “pencil out.”

At the October school board meeting, board members again expressed concerns about the financial risks and community reaction. Proposals were made for community outreach efforts, including putting information on the District website and sending a mailer to all residents living within 300 feet of the schools. Staff issued a Request for Proposals (RFP) for the solar project, as vendor bids and renderings of the project at the eight campuses under consideration for solar would provide a more detailed picture of the costs and appearance of the panels. The Board formed a Solar Advisory Committee and allocated $30,000 to undertake a detailed financial analysis of the project to determine if it was financially viable and to provide a definite answer to concerns and uncertainties about risks, potential utility rebate reductions, and the District's ability to repay the bonds within 15 years.

Through November 2009, the board continued to narrow down vendors who had responded to the RFP. Financial consultants addressed the board, explaining that solar generated electricity would be cheaper over a 25-35 year period than continuing to purchase energy from PG&E, and that acting sooner rather than later would be optimal for taking advantage of PG&E rebates, which were quickly falling. Furthermore, going solar would help the District comply with any future state mandates to reduce greenhouse gas emissions. The board remained skeptical of the project and wanted more certainty of the costs, but board members agreed to form a Joint Exercise of Powers Agreement (JPA), in which the District would deposit and invest funds annually, so they would accrue interest to help repay the bonds.

Another special board meeting was held in November to keep the board on track to meet the state mandated December deadline to formalize the acceptance of the QSCB allocation. Community members addressed the board, citing other districts that had gone solar and pointing out that students, teachers, and the community were enthusiastic about the project. Board members remained anxious about the risks and were feeling rushed about the deadline; it seemed possible that they would defer their decision to go forward letting the 2009 QSCB allocation lapse, and wait for the 2010 allocation[1].

A Reprieve

In December, the California Department of Education extended the deadline on the acceptance of QSCBs due to complications with the manner in which the bonds were allocated. District staff organized mailings and e-mails to the community, and local press published several articles about the project. At the December board meeting, community members addressed the board, expressing concerns about the appearance, maintenance, and safety of solar panels. The board was relieved to have the extension, feeling that the previous deadline was "unmanageable," and expressed its desire for public approval of the proposed project. Further concerns abounded about uncertain future PG&E rate increases and the District's exposure if the awarded solar firm went out of business after the panels were installed.

In March 2010, SunPower Corp. emerged as the preferred vendor. The Solar Advisory Committee visited the firm and reported that they felt confident that the District had made the right choice. The board was convinced that the project would pencil out within 16 years, and be cost-neutral or generate savings for the District, even if PG&E rates remained constant over the payback period. This affirmation marked a turning point for many members of the board, who began to see the solar project as a superior alternative to purchasing electricity from PG&E, and that the risks of *not* doing the project far outweighed those of doing it.

[1] The enabling legislation for the 2010 QSCB allocation (AB2560) requires that a school district have voter approved bonds to qualify for an allocation. SRVUSD would not have been eligible for a 2010 allocation under this criterion.

The Plan is Approved

On May 25, 2010, the board unanimously voted to approve the solar project. They were presented with the contract with SunPower Corp. to install solar panels on the parking lots of six campuses: California High School, Dougherty Valley High School, Monte Vista High School, San Ramon Valley High School, Diablo Vista Middle School, and Gale Ranch Middle School. The project would cost $23 million and generate $31 million in energy savings over a 16-year period, almost $5 million of which would benefit the general fund over that period (with a total of $22 million benefiting the general fund over the 25 year life expectancy of the PV systems).

The 3.3 MW PV system would generate 6.2 million kWh per year, about 66% of the electricity needed to run the schools[2]. SunPower Corp. will provide operations and maintenance (O&M) and performance guarantees for 16 years. The PV will reduce the District's carbon footprint by 1,400 metric tons of CO_2 annually. The installation of the panels will generate the equivalent of 60 jobs in construction and design, injecting $4 million in wages into the local economy. Construction will begin in the summer of 2011.

Epilogue

The SRVUSD Superintendent is very proud of the solar project and the work that the school community did to help the District reach a good result. Because SRVUSD is a California Distinguished School District, the Superintendent believes that it should model good stewardship—since the District is so visible, it should be working to reduce its carbon footprint and practice sustainable energy use. Moreover, he believes that the District's consideration of solar was a model of good decision making in the public sector, and is proud to be using the money wisely, in a way that will generate savings, stimulate the economy, and benefit the children of the school District. Initially, he thought that solar was the right thing to do, but he wanted to be sure that the project would make financial sense before recommending that it be approved. He recalls that the Solar Advisory Committee, formed of a cross-section of experts and citizens (both believers and skeptics), lent validity to the project, and their positive report about SunPower Corp.'s proposal gave him the confidence to move forward. When the bonds were sold at a rate that met the most optimistic models, the Superintendent became even more enthusiastic about the project. He is pleased with the District's communication with the public, and felt that concerns expressed by the community and local newspapers enabled the District to address and clarify questions about the project. He is proud to be using this money in a way that benefits the District's students, promotes sustainable practices, and reflects well on the District.

Board members expressed concerns about the financing of the project, the uncertainty of future PG&E rate increases, and the possibility that solar technology would become cheaper or obsolete in the future. They also felt extremely rushed with the initial timeline associated with putting QSCBs on the market, not feeling confident that they had all the necessary information, and time to do their due diligence. The Solar Advisory Committee report that the project would pencil out even with the most conservative models was a turning point for many of the board members: it was now clear that the project made financial sense. One board member suggested that forming the committee and consulting experts sooner would have made for a smoother, swifter negotiation process, and may have allowed the District to take advantage of higher PG&E rebates.

[2] School PV systems are often sized to produce between 70-80% of needed electricity because the *value* of that amount of PV generated electricity will often be enough cover a school's electricity bill. Energy efficiency improvements and better conservation behaviors should be a continuous goal of the District's school community since districts will now receive a credit from PG&E for the value of any electricity that exceeds the value of the consumed electricity (AB2466).

Appendices

Appendix 1: District website and "Solar Scenarios"

- District Website Solar Information: http://www.srvusd.k12.ca.us/solar
  Includes photographs of the projected solar installations and notices sent out to the community.
- Financial modeling with conservative to optimistic PG&E rate increases: Solar Scenarios

Appendix 2: Mason/KyotoUSA FAQ

These questions are based on concerns we heard expressed by the community in board meetings, local newspapers, and online comments on news articles and blogs about the project.

Solar FAQ

Q: Why doesn't the District use the $25 million on projects that the schools really need, like improving facilities, or hiring more teachers?

A: The $25 million in Qualified School Construction Bonds (QSCBs) cannot be used to hire teachers or expand programs; they are intended to help districts pay for construction projects only. QSCBs are different from the General Obligation (GO) bonds that the District normally uses for construction projects. First, the GO bonds are approved by the District's voters and are secured by the value of the assessed property in the District. In effect, local property owners pay off the bonds. The QSCBs are different. The tax payers are not directly paying off the bonds; rather, the District is using the savings on the avoided electricity costs, utility incentives, and accrued interest to pay off the QSCBs. For that reason, it is essential that the District invest the money in projects that will be either revenue neutral (no pressure on the General Fund) or, better yet, revenue positive – putting more money into the General Fund than what is needed to pay off the bonds. We believe that an investment in the solar project will always be revenue neutral and likely generate revenue for the District.

Q: Solar is a notoriously inefficient energy source. Solar is not pollution free: it takes toxic chemicals to produce the cells. The amount of pollution generated per kilowatt hour is relatively large with solar. Why don't we wait until something better comes along?

A: Solar panels and the inverters that convert the Direct Current (DC) produced by the panels to Alternating Current (AC) that is exported to the grid are improving all the time. In our Request for Proposals we are looking at a number of factors, including the number of kilowatt hours that the offered panels produce.

The production of solar panels, like the production of all electronic equipment e.g. computers, monitors and cell phones, produces toxic by-products. Organizations like the Silicon Valley Toxics Coalition are pressuring manufacturers to clean up the production process and agree to recycle the solar panels when their useful life is over. Some US manufacturers have already agreed to recycle the panels.

The technology associated with solar panels has changed little over the past 50 years. Panel and inverter efficiency is improving marginally. New types of materials are being used, but in general, the crystalline panels we are considering are, in effect, state of the art. They are also reliable, long-lived, and produce more electricity per square foot than other technologies, like thin-film solar.

Q: Can we wait a few years to see if solar gets less expensive and/or more efficient?

A: This bond is only available for a limited time, and we don't know if similar bonds or stimulus money will be available in the future. Also, right now the PG&E rebates for solar energy are generous and the price of solar panels is relatively low because of the recession. Installation costs have also been falling due to the economic downturn. There's no guarantee that this favorable combination will last; this is an excellent opportunity.

Q: Why aren't other school districts going solar?

A: Actually, many districts in California are turning to solar energy, including Milpitas, San Jose, San Mateo, San Diego, Los Angeles, Oxnard, Mt. Diablo Unified School Districts to name just a few.

Q: How can the District even consider incurring so much debt with the budget problems we are facing?

A: Financial consultants have analyzed the solar project and determined that it will provide cost savings and actually generate income for the school District. The District will be paying the solar panels with savings on electricity (which gets more expensive every year!), rebates, and accrued interest.

Q: Why can't we put the solar panels on the roofs of the schools? Solar panels in the parking lots will be ugly.

A: A number of the schools' roofs are not oriented well for solar panels. There are also issues about the ages of the roofs and concerns about penetrating the roofs to anchor the solar panels. Panels in the parking lots will provide shaded parking and better lighting at night.

Q: Has anyone considered that the panels may be vandalized, or that kids will crash into the solar supports? Are the solar panels going to be dangerous? What if kids climb on them or get shocked? There is a lot of theft of solar panels going on. How will we prevent that? Will we be insured?

A: All of these issues have been considered. Insurance and security costs are included in the projected cost of the project.

Q: Will there be batteries on the school sites used for energy storage?

A: No.

Q: I've heard that there are problems with firefighters putting out fires if solar panels are present.

A: This has been considered and discussed with the fire department. Fire lanes and fire access roads will not be affected.

Q: How will the District handle maintenance and repair of the system? Solar needs washing and weatherproofing: systems are costly to maintain and repair. That could be a huge expense down the road. How will we find the money to pay for this out of our general fund?

A: Maintenance costs are included in the projected cost of the project for the first 16 years.

Q: What if the panels don't generate as much energy as is claimed? Are there performance guarantees or warranties?

A: The company that is awarded the contract will guarantee the output of the panels. If the production of electricity falls below the guarantee, the company will compensate the District accordingly.

Q: What if the company that guaranteed performance and maintenance goes out of business?

A: The major elements of a solar installation are the panels and the inverters. These components are warranted by the manufacturers, not the installer.

Q: I don't believe global warming is a problem. Why are we considering this project?

A: Regardless of your views on climate change, solar panels are a good choice for the District for economic reasons. The District is facing a budget crisis, and solar panels will provide fixed energy costs for years to come and will generate income for the District.

Q: Why are we wasting all of this money on a "feel good" project when the District faces real financial problems?

A: This is more than a "feel-good" project: solar panels will provide much-needed income and cost savings for the District. The panels also provide important environmental benefits, i.e. reduction in CO_2, SO_2 and NOx from fossil fuel combustion, and economic benefits by creating jobs that benefit California as well as the local economy.

Q: Does someone on the Board or at the District have a relative in the solar business or anything to gain financially from this project?

A: No.

Q: How are the solar vendors being selected?

A: A Request for Proposals (RFP) was issued by the District. The Board is reviewing the proposals now and will select the vendor that best meets the criteria set out in the RFP.

Q: Why aren't we looking into reducing energy use at the schools? I have seen doors open with the A/C blasting in hot weather, lights left on all night, etc. Why aren't we addressing conservation before spending so much money on generating solar?

A: Conservation is a key element in reducing energy costs, and it is important that it be addressed. Conservation together with solar will provide even greater savings.

Q: How will we meet the state mandate (AB32) to reduce CO2 emissions if we do not do this project? What will happen if PG&E rates go up more than 3.2% a year and we don't do the solar project? Where will the money come from to pay those energy costs? What if cap and trade passes and energy costs go way up? How will the District deal with those increased expenses if we don't do solar now?

A: It is unlikely that the District would be able to deal with these energy costs and mandates without further strain on the general fund. These are all reasons why going solar now is a good idea for the District.

Q: How likely is it that the school District will lose money on this project? What is the worst case scenario and what is the best case scenario?

A: The District has asked its consultants to provide the most conservative estimate of the cost and benefits. Under this scenario, the District will see no pressure put on its General Fund. Should the PV system ultimately perform above the production guarantee provided by the vendor and PG&E prices increase above the modest estimates, the District will realize even greater benefits than have been described.

Appendix 3: Sustainable Contra Costa Nomination

The Mason family and KyotoUSA nominated the SRVUSD Superintendent and Board of Education for the 2010 Sustainable Contra Costa Award. The nomination letter can be found here.