Lessons Learned in Solar PV Procurement for Community Colleges

Spring 2011 ACBO Conference

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Shasta-Tehama-Trinity Joint Community College District

ACBO – Spring 2011 Conference

Going Solar: Lessons Learned

Shasta College

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ACBO – Going Solar: Lessons Learned

Topic for Today – 7 Lessons Learned →Case study of Shasta College + the League's experience with 11 other districts

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Solar Field Project

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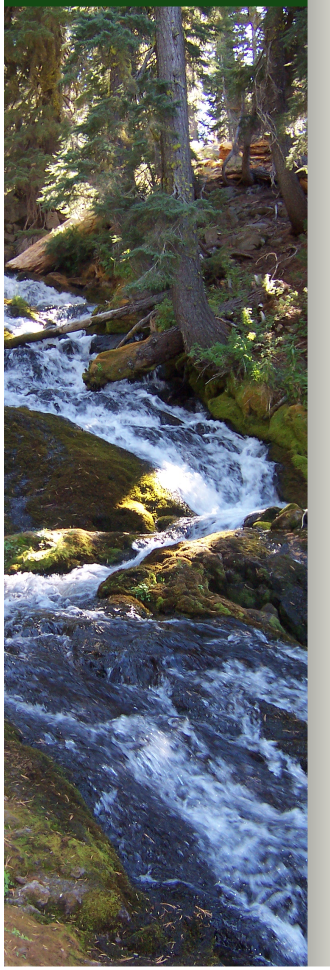

Solar Field Project

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Lesson 1:
Use an RFQ/RFP Process

- An RFQ/RFP process generates healthy price and quality competition. You can enjoy huge cost savings compared to working with a single solar vendor.
- The RFP should be written in "best value," not "lowest price," terms.
- You don't have to figure out the micro-engineering aspects for the RFP—let the vendor respondents give you various "looks," which will play off their particular strengths and give you valuable ideas.
- Provide site electrical drawings, as-builts, geotech reports, roof conditions, utility usage data, and contract template.
- Focus on economic value, i.e., how much your expected electricity bills will be reduced by each proposed project.
- Track record is vitally important.
    - Corporate longevity
    - Experience with education institutions and DSA
    - Technology quality and reliability
    - Specific performance of previously installed systems
    - Contract terms and conditions
    - Customer references
- Craft RFP and organize responses to facilitate "apples-to-apples" comparison.

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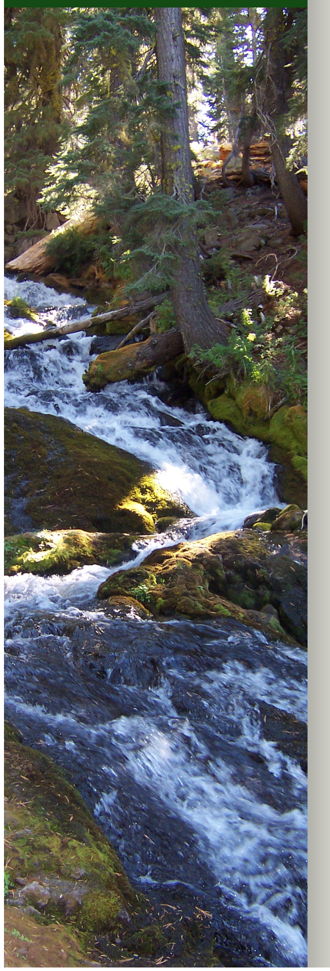

Shasta College – A Case Study

SHASTA COLLGE'S PROCESS – COMPETITIVE PROCUREMENT

- Completed preliminary cost/benefit analysis of potential project, presented to board's capital outlay committee
- Issued an RFQ
- Issued an RFP to companies selected from RFQs received
- Applied a matrix to look at RFP data & selected company
- Used Government Code Section 4217.10 *et seq.* to enter into an energy services contract with selected company

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Shasta College's Metric used to Analyze RFPs

	Winner	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Price	$7,192,870	$5,584,191	$7,285,000	$7,271,226	$6,444,194	$7,363,125
Estimated PG&E Incentive	$3,622,060	$2,621,469	$3,309,732	$3,232,547	$2,366,344	$3,045,897
Estimated cost after incentive	$3,570,810	$2,962,722	$3,975,268	$4,038,679	$4,077,850	$4,317,228
Estimated % of cost rebate covers	50.4%	46.9%	45.4%	44.5%	36.7%	41.4%
Estimated 10 year output (kWh)	22,697,034	16,426,996	20,739,884	20,256,217	14,828,297	19,086,605
Estimated 25 year output (kWh)	54,679,040	39,573,998	49,964,105	48,798,909	35,722,600	45,981,217
Estimated net price/ 10 year kWh	$0.157	$0.180	$0.192	$0.199	$0.275	$0.226
Estimated net price/ 25 year kWh	$0.065	$0.075	$0.080	$0.083	$0.114	$0.094
Est. 1 year savings on power ($.13/kWh)	$301,761	$218,400	$275,741	$269,310	$197,145	$253,760
Cents/kWh- 10 years (pre-incentive)	$0.317	$0.340	$0.351	$0.361	$0.430	$0.386
Estimated % of annual power used	38.9%	28.2%	35.6%	34.7%	25.4%	32.7%

Lesson 2:
Proper Analysis of Electrical Rates

- Important to accurately model solar-derived utility savings by mapping hourly solar production expected from a solar system against actual utility rate schedules
- Consider opportunities to switch to solar-favorable tariffs.
- What to assume about future utility rate changes?
- Modeling needs to be realistic about possible solar outages and cloudy days, which will mostly negate "demand-based" savings.

Lesson 3:
Determine Solar PV Cost Effectiveness

- Most solar PV will pay off in the long term, i.e., during the operating lifetime of the solar system, even in regions of the state that are not considered "sunny."
- Review but don't rely on solar vendors' analyses.
- Get a year's worth of hourly solar production estimates from your vendors.
- It's up to you (and your board) how long or short you need your payback period to be or what other economic justification you require.
- Obtain informed estimates of future electricity costs, surcharges, and Renewable Energy Credit values.
- Incorporate long-term maintenance and equipment replacement costs.
- Make sure your economic analyst is very well versed in utility rates and the wide range of tariffs that could potentially come into play.

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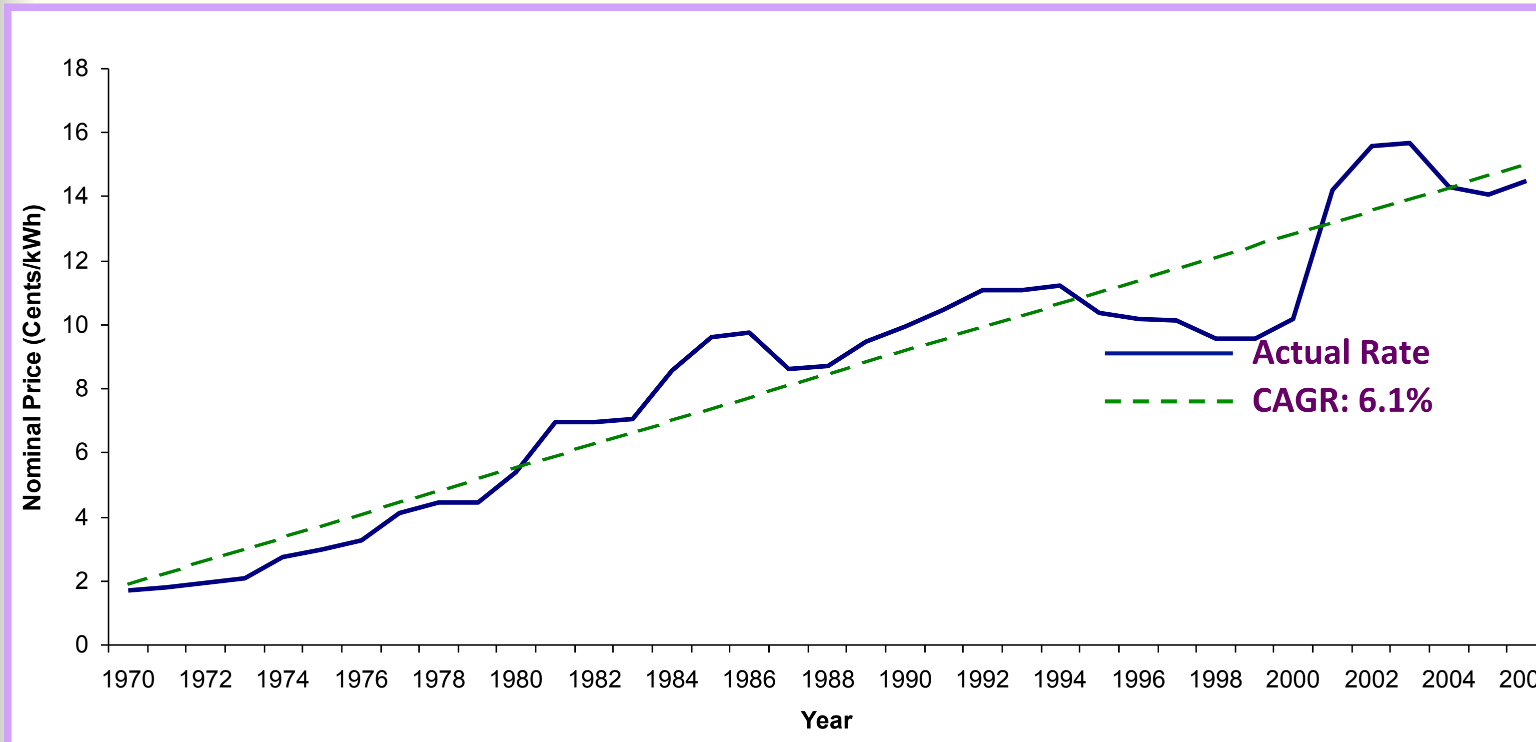
California Historical Energy Rates for Commercial Customers, 1970 - 2006

CA Historical Annual Energy Increase = 6.1%



Sources

- U.S. Dept. of Energy, Energy Information Administration, www.eia.doe.gov/emeu/states/sep_prices/com/pr_com_ca.html
- California Energy Commission (CEC), www.energy.ca.gov/electricity/retail_price_forecast/rates_in_real_dollars.xls
- California Public Utilities Commission (CPUC) www.cpuc.ca.gov/static/energy/electric/rates+and+tariffs/att1chart1.pdf

(from websites visited in 2008 – pages may have changed)

Solar Field - 6% energy escalation (saves $8.6 million after 25 years)

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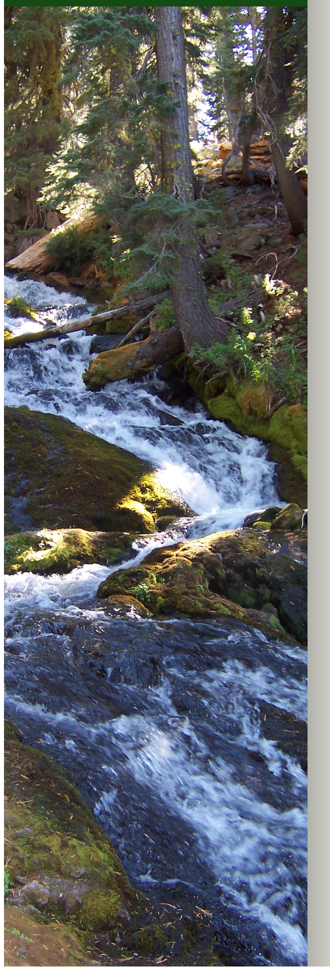

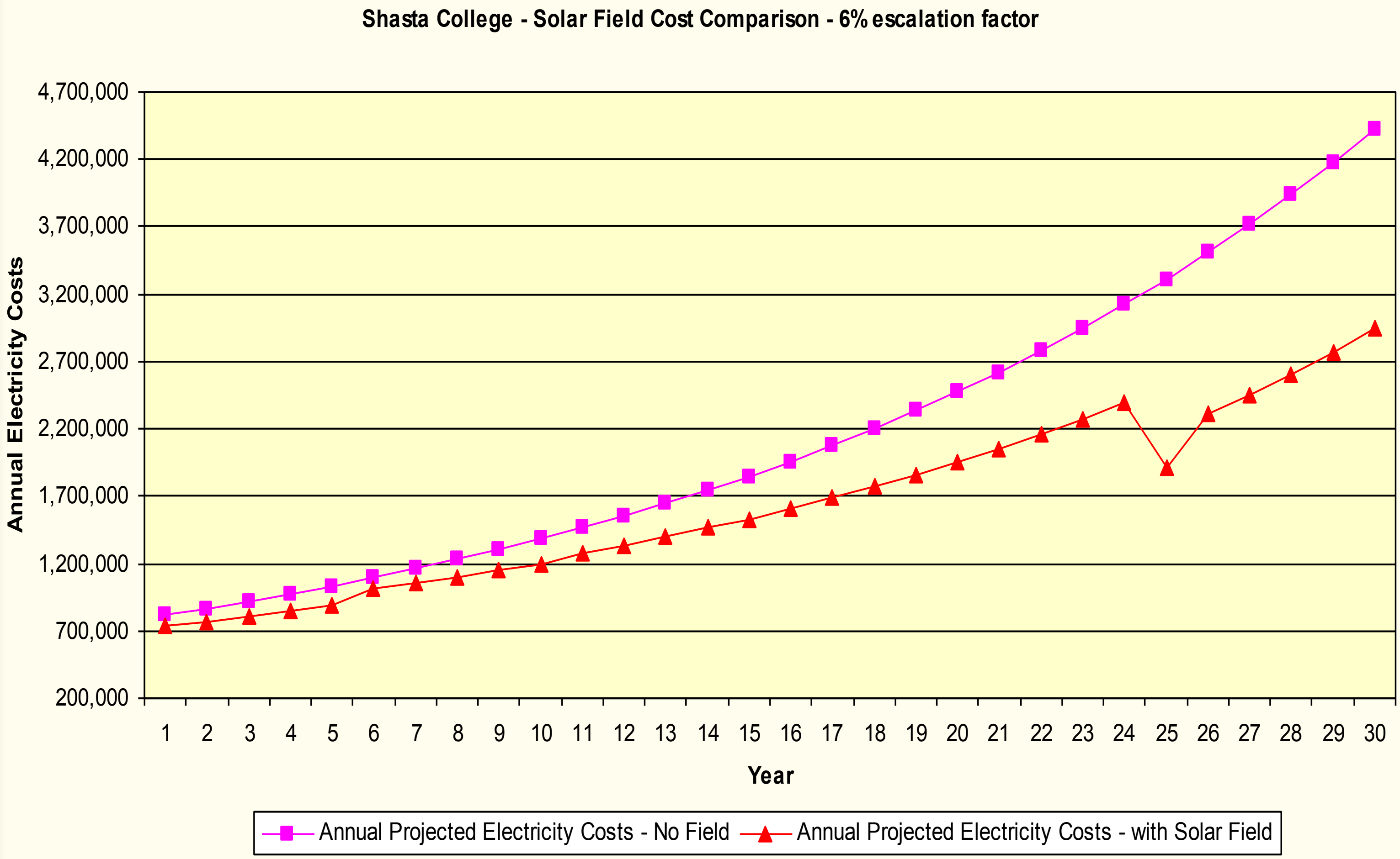

Solar Field - .64% energy escalation (breaks even after 20 years – saves $476,000 after 25 years)

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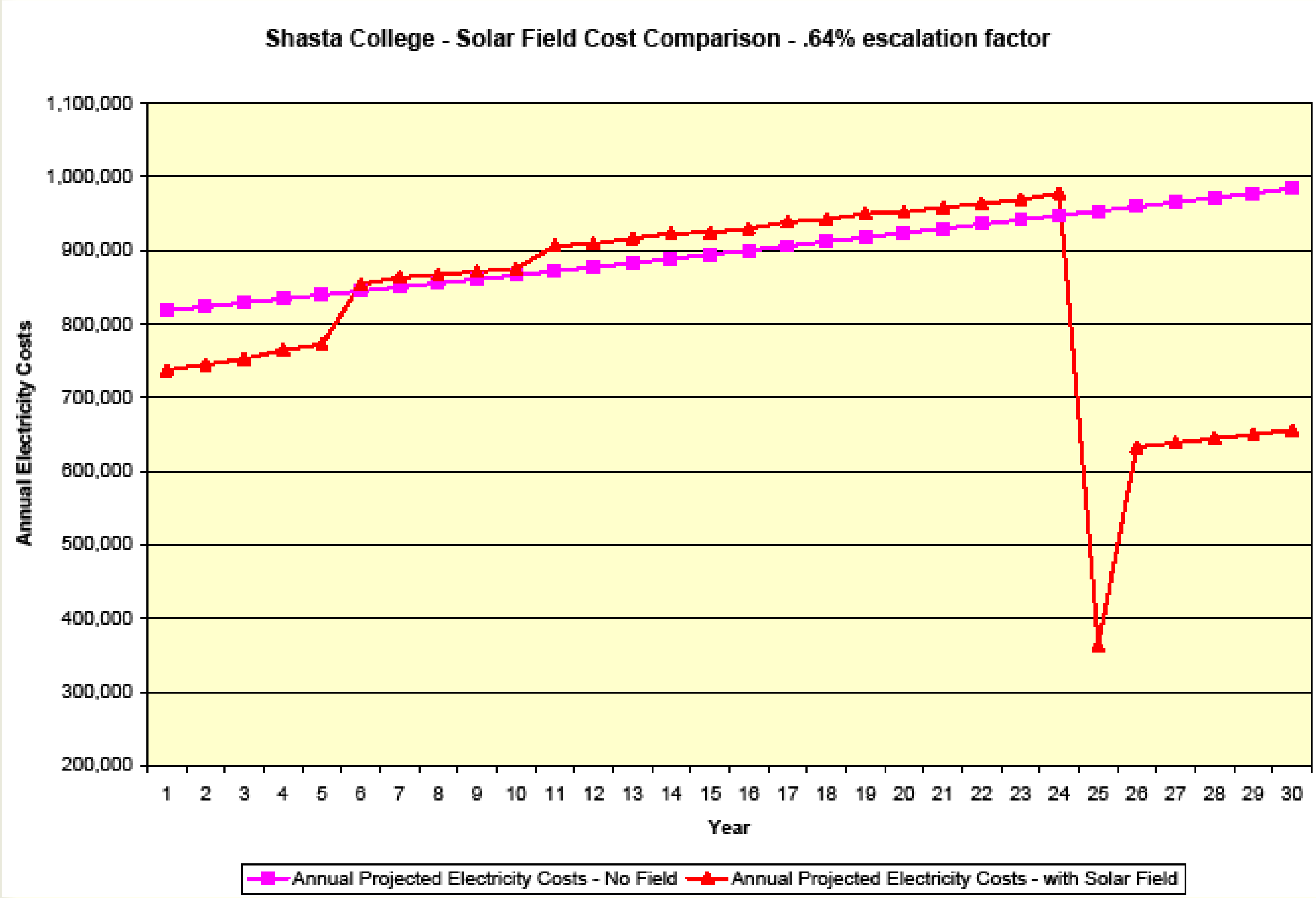

Solar Field ~ 3rd party independent analysis -1.5% energy escalation, other different assumptions (saves $4,055,000 after 25 years)

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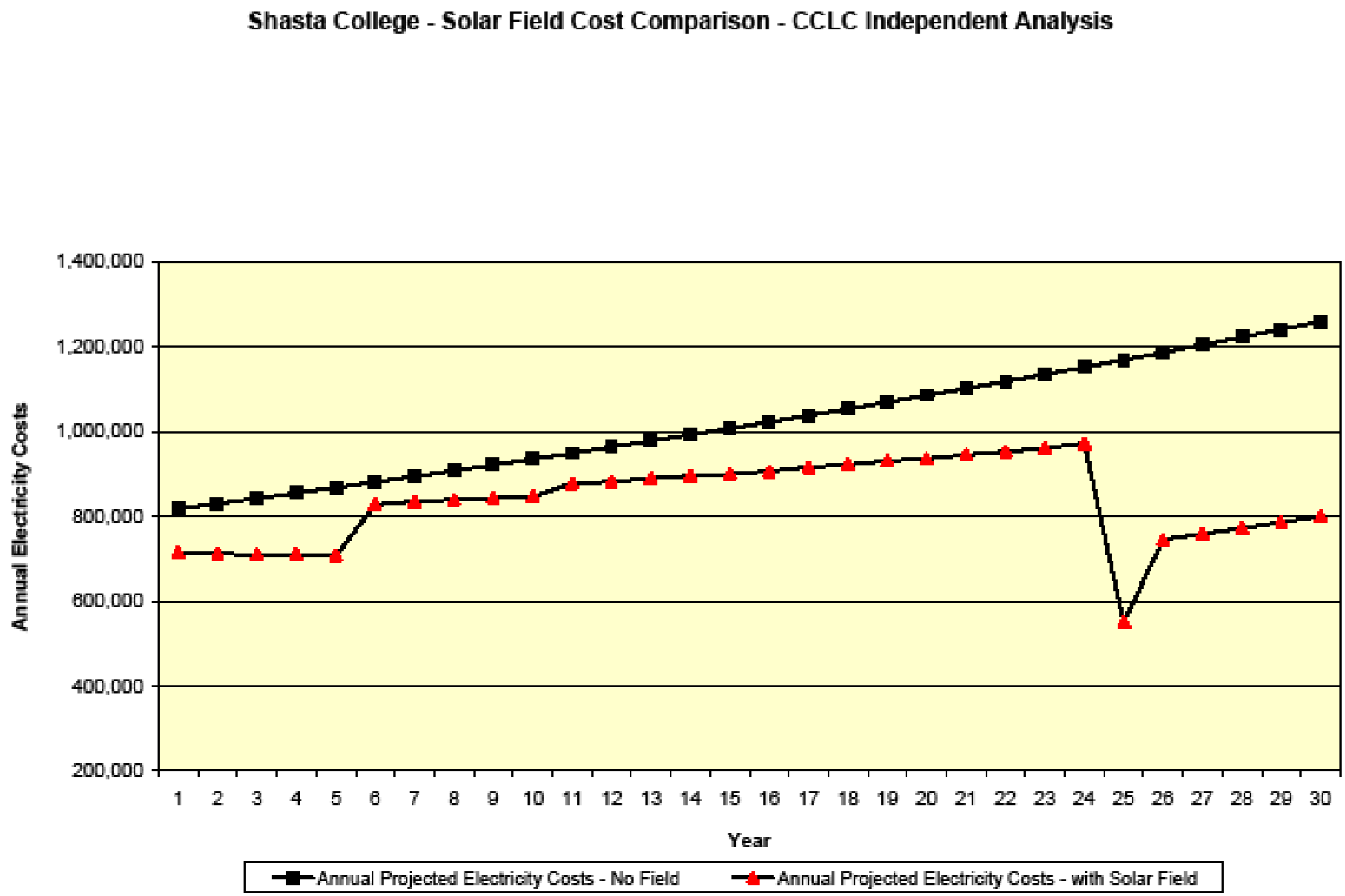

Solar Field ~ 3rd party independent analysis -0% energy escalation (break-even at 20 years, saves $350,000 after 25 years)

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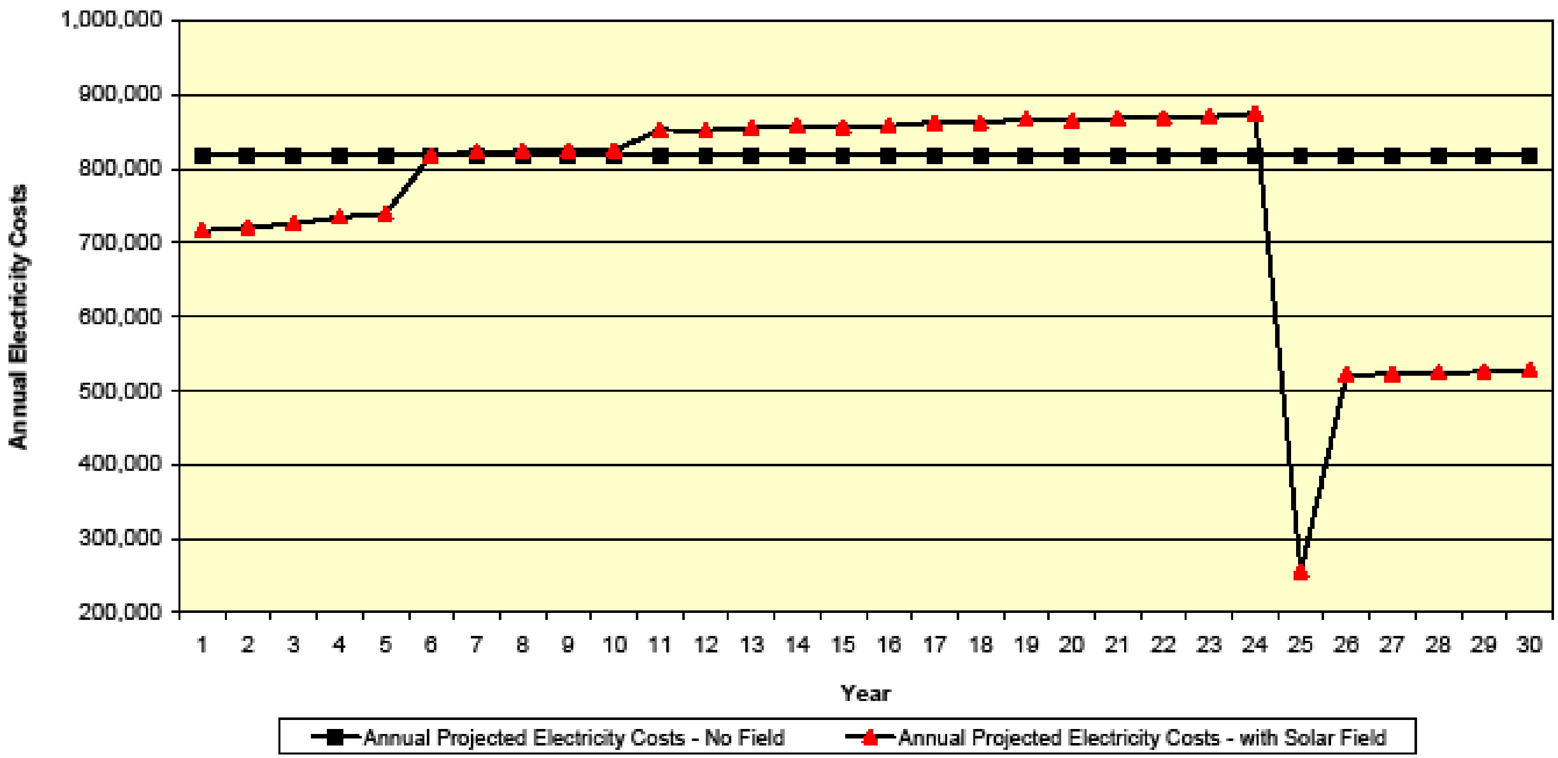
Shasta College - Solar Field Cost Comparison - CCLC Independent Analysis



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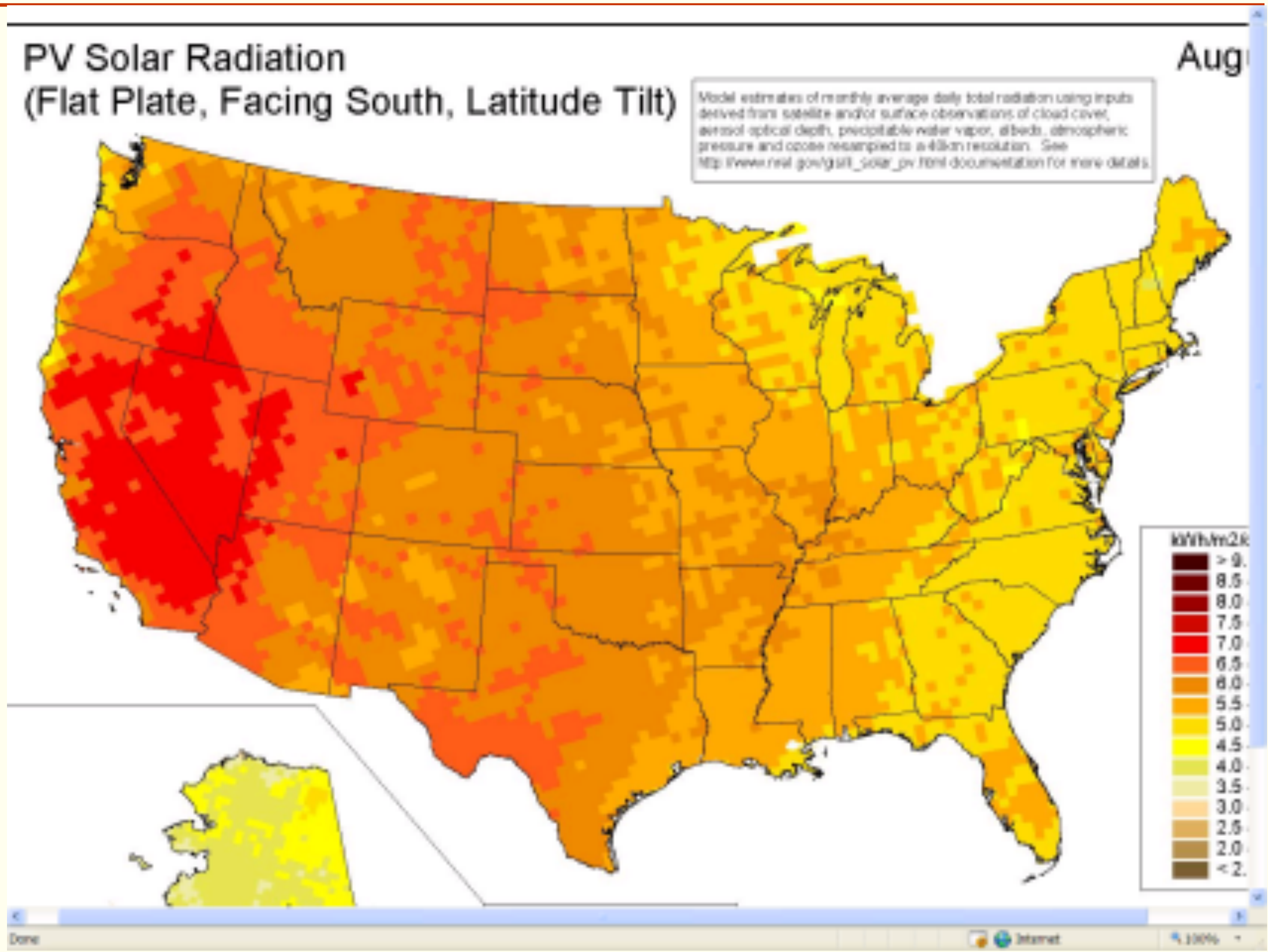
Solar – A Good Fit for Campuses



Nearly all areas of California are favorable for Solar PV

Lesson 4: Strong Performance Monitoring

- Monitor! In real time! This is your vendor's responsibility.
- Evaluate vendors' monitoring capabilities and track records.
- Visit the facilities of finalist vendors to observe their monitoring system for existing customers.
- Request performance data from past customers in your RFP.
- Tie real-time monitoring to prompt corrective response in your contract with the vendor.

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Solar Field Project – Performance

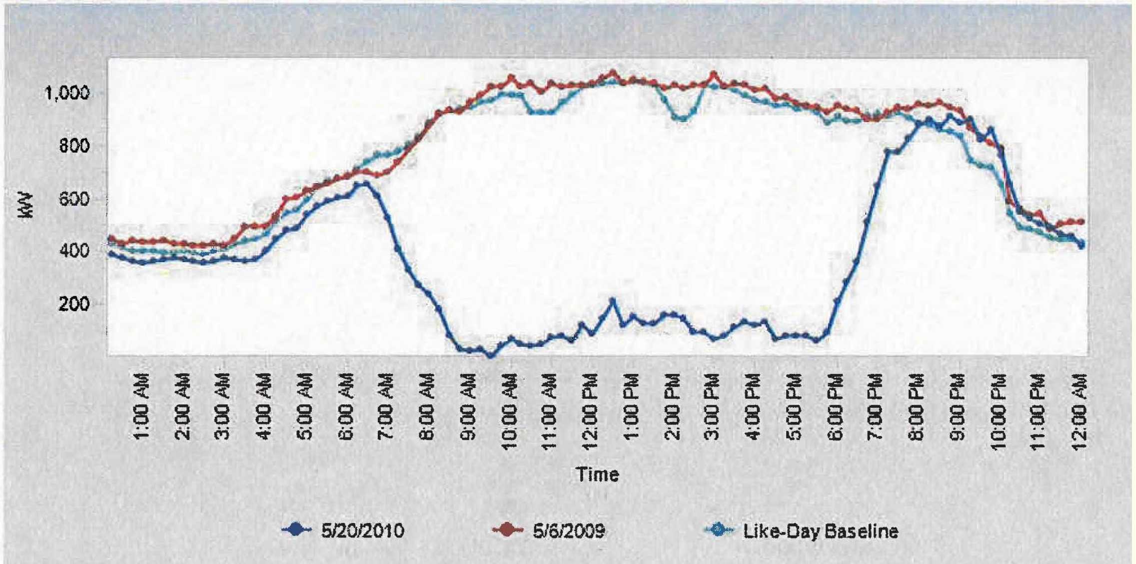
Baseline Analysis

Pacific Gas and Electric Company

Report Date	5/26/2010 2:59 PM
Date analyzed	5/20/2010
Comparison date	5/6/2009

Customer SHASTA COLLEGE

Baseline Load Profile



Data Summary

REDDING 2491353005 11555 OLD OREGON TRL 4445R8 FY600-1	Average (kW)	Max Value (kW)	Max Timestamp	Min Value (kW)	Min Timestamp
5/20/2010	356	916	08:45 PM	8	09:30 AM
5/6/2009	807	1,076	12:30 PM	421	02:15 AM
Like-Day Baseline	773	1,046	01:00 PM	393	02:30 AM

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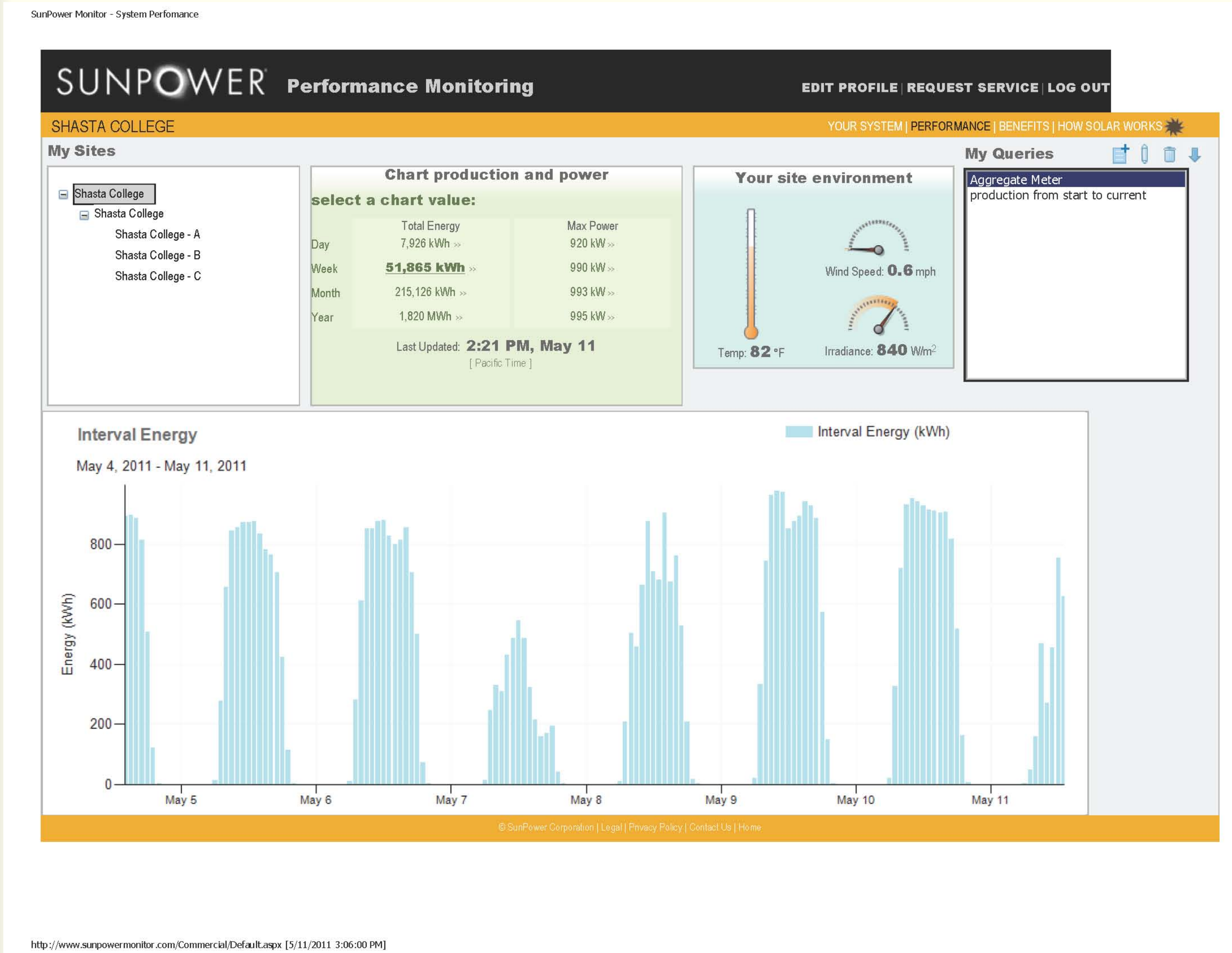
Solar Field Project – Performance



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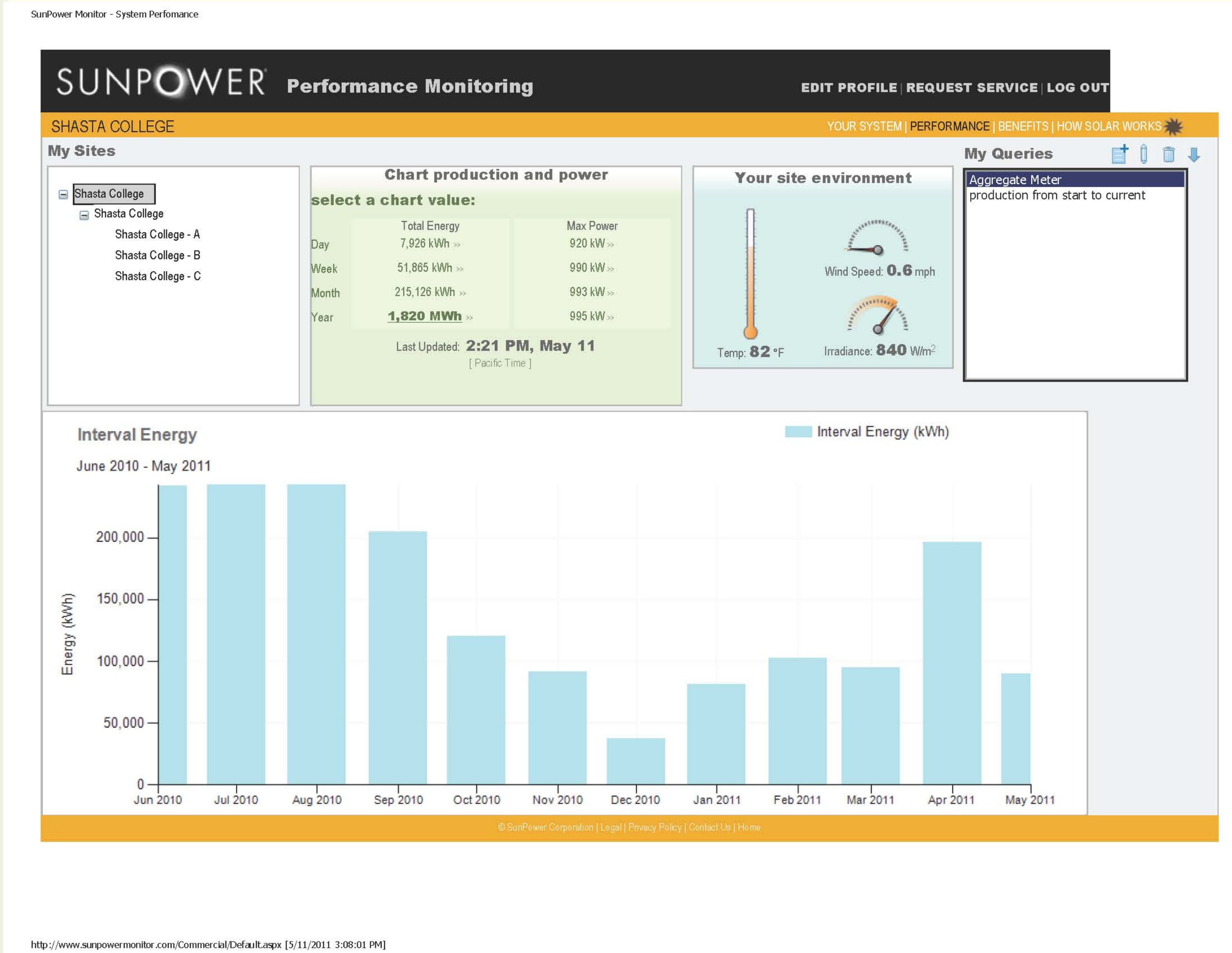
Solar Field Project – Performance



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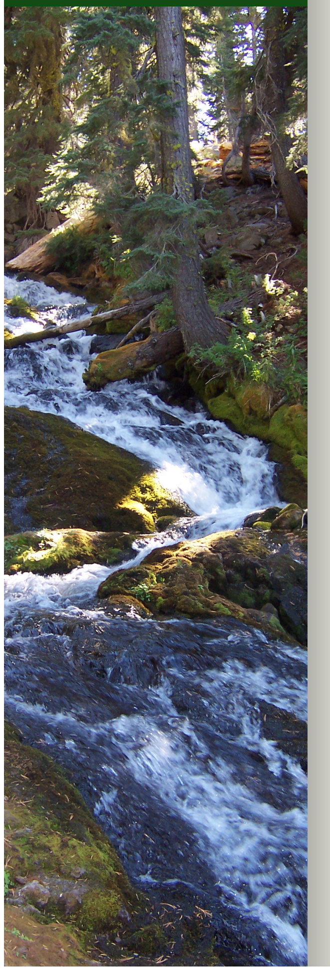

Best Practices

- Ensure adequate warranty coverage for inverters, modules, and module output
  - May differ from company to company
  - Extended coverage available
- Assess solar provider financial viability and experience
  - Long-term asset
  - Could impact financing costs
- Focus on cost per unit output ($/kWh), not cost per unit capacity ($/kW)

LESSON 5:
Evaluate Performance Guarantee Options

- Very often neglected in the procurement and contract negotiation processes.
- Not mandatory but generally a good idea.
- Lots of devils in the details to guard against – don't rely on broad language from vendor.
- Guarantees should set the floor – with few if any missing floorboards – for the economic value of the project as previously analyzed in the procurement process.
- Guarantees should be tied to both lost utility bill savings and lost solar incentive savings.
- Properly developed and negotiated, gives boards and trustees the security they're seeking when making a significant capital investment decision.

LESSSON 6:
Educate Your Board Along the Way

- Early and often.
- Schedule workshops.
- Focus on "two handed," not "one handed," benefit/cost/risk analysis.
  - One handed: considering only the risks and costs of solar and ignoring the risks and costs of NOT procuring solar
  - Two handed: Comparing the benefits, costs, and risks of your best solar option against the corresponding benefits, costs, and risks of the *status quo, i.e.* continuing to get all your electricity from the utility.

LESSON 7:
Be Sure to Obtain Needed Expertise

- Preliminary solar PV site evaluation
- Economics and rate analysis
- Financial analysis and identification of innovative financing options
- Designing and running RFP process
- Evaluating solar vendors and their proposals (great proposal doesn't necessarily mean a great solar vendor)
- Legal support
- Consulting with utility and CPUC on tariffs, rates, solar incentives

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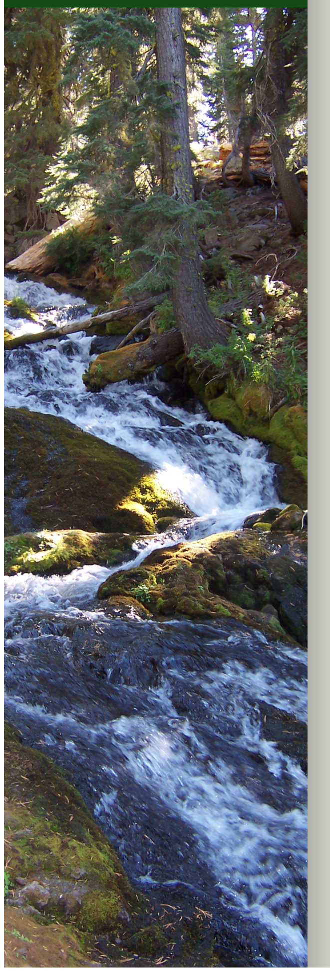

Lessons Learned – Shasta College Summary

- Communication – internal & external
  - Environmental concerns – land use, impact on trees (NIMBY syndrome applies)
  - Reach out to stakeholders early to address these concerns
- Know your Board
- Find your ‘Internal Champions’ early in the process
- Do not hesitate to use the League’s help (external experts)
- Examine worst case/best case scenarios
- Can use sole source process in combination with RFP/RFQ process to get best price

A District's Ultimate Objective When Considering Solar PV: Creating the *HIGHEST VALUE* Solar System (which is rarely the *LOWEST COST* system)

.... How do you do that? Use a rigorous, tightly integrated procurement and evaluation process.

- The key monetary considerations are shown on the top.
- The key performance assurance considerations are shown on the bottom. Warranties alone are not sufficient to protect your investment.
- Both sets of considerations--*monetary* and *performance assurance*--are essential to maximizing the value of your solar system.
- A strong *competitive procurement process* not only delivers good pricing and terms but also enables you to select a well qualified solar vendor.
- All these elements need to be tightly integrated, both in your overall procurement process and in the crafting and negotiation of your contract.