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# PRACTICAL WINERY & VINEYARD

JANUARY/FEBRUARY 2008

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**BY Tina Viera**

**U**ntil it is more widely adopted, installing solar photovoltaic (PV) panels and the supporting parts of a system to run them and produce energy for your winery/vineyard is expensive in the short term.

In a 2006 cost study, PV panels cost \$6.50 to \$7.50 per installed watt. Multiply the low number by an average winery PV installation to date, such as the 78 kW at Robert Sinskey Vineyards (Napa, CA), and you get a significant cost of \$507,000 for the system.

In the long term, going solar is a no-brainer; you become your own energy producer with reduced or zero electrical bills, pay off your initial capital investment in the first five to 10 years, and the panels continue to generate free energy for 25 to 30 years. The \$10,000/month your winery was paying for electricity is now going in the bank, and you are not paying rising utility rates like your neighbors.

PWV consulted a number of finance experts and solar installers, and found that there are five basic finance models

wineries can use for the initial capital costs of installing solar energy (see Table I).

#### **Rebates and Incentives in California**

The state of California continues to fund incentives to install renewable energy, most recently by channeling funds through the California Public Utilities Commission (CPUC) under a program known as the California Solar Initiative (CSI). In addition to the overall \$2.9 billion in funding over 10 years, what used to be two programs are now combined into the CSI, which is being run by the major utilities.

Table II shows current rebates and incentives available for commercial solar installations. Rob Erlichman of Sunlight Electric (San Francisco, CA) translates some of the terms.

"The trigger is a mechanism incorporated by the CPUC in the CSI that, in essence, meter the subsidies out appropriately as demand for them rises," Erlichman explains. "In other words, the more people want subsidies, the less the state needs to give away.

"This is also supposed to reflect that as the early purchasers are subsidized,

**The Fetzer Vineyards' solar panel installation was 40kW in the late 1990's. The 2006 addition of 1.1 million kW made Fetzer's system the largest at any winery in the world.**

the manufacturers of PV equipment will be increasing production, and they should be able to lower prices. Triggers are based on the very successful 10-year PV subsidy programs in Germany and Japan that started in 1990 and 1995, respectively, and now PV markets in those countries are thriving without such aggressive early subsidies.

"Performance-based incentives (PBIs) are paid on actual system output over time. In other words, the CSI 'rebate' for PV systems over 100 kW is now a performance-based payment of \$0.26 for every kilowatt-hour produced in the first five years. Before the CSI came into existence, the state paid an actual rebate of cash based on the rated specifications of the system."

Basing the incentives on the performance of the PV panels and the inverters that comprise the system was a "smart move" on the part of the CPUC, according to efficiency advocates, since panel performance numbers are based on perfect lab conditions, and would



Stoller Vineyards (Dayton, OR) installed a 244-panel PV system as part of the LEED-certified winery built in 2006.

rarely be as high under field conditions such as overcast days, dust and dirt on the panels, distance of panels from the inverters, and other factors. Inverter efficiency is at about 94% to 95%, and slowly rising, Erlichman notes.

The PBI encourages panel manufacturers to reach for better output, and installers to design systems that will perform best in the field, and businesses to maintain PV systems at peak efficiency, for maximum rebate dollars.

"There are really four issues here," says Erlichman about panel performance. "The first is the PV module manufacturers' silly practice of using a 'nameplate' rating and how that can be misleading. For example, Sharp has a '208-watt' module and Sanyo has a '200-watt' module, so a 208 should be better than a 200, right? Not quite.

"Looking at the published performance under 'standard test conditions' using PVUSA (Photovoltaics for Utility Scale Applications) methodology, which the California Energy Commis-

sion (CEC)/Self-Generation Incentive Plan (SGIP)/CSI requires we use for any calculations, we see that the Sharp 208 puts out only 183.3 watts while the Sanyo 200 puts out 188.7 watts. System designers and installers should be educating customers about these differences, which apply to all module sizes.

"The second issue is space-efficiency," he continues. "Using the comparison of the two modules above, the clear winner is the Sanyo, right? Again, not quite. The Sharp module takes up 17.5 sq ft while the Sanyo is 12.7 sq ft, so if space is at a premium, it might be worth paying a premium price for the Sanyo. But if space isn't a concern, why pay more — the customer could well save some money and get the Sharp module.

"Which brings us to the third issue — different technologies perform differently. The Sharp 175-watt modules at Frog's Leap Winery (Rutherford, CA) were fairly sensitive to the dirt kicked up from the well-traveled adjacent unpaved road, so we put in a

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## SUSTAINABLE BUSINESS

Table I: PV Financing Strategies

	Pay Cash	Home Equity Loan	Commercial Loan	Lease	Power Purchase Agreement
<b>Description</b>	Pay for investment from cash/ retained earnings	Home equity loan on personal property used to fund purchase	Commercial loan to fund purchase	Third party owns system; customer makes lease payments for term of lease. Purchase option at end of term	Third party owns system, sells power at close to utility rates for term of agreement. Usual/often typical purchase option at end of term
<b>Non-cash purchase allows for potential of immediate positive cash flow and, depending on terms, lifetime positive cumulative cash flow.</b>					
<b>Pros</b>	Simplest payment mechanism	<ul style="list-style-type: none"> <li>• Usually the highest NPV (Net Present Value)</li> <li>• Longer terms available</li> <li>• Lower rates</li> <li>• Federal deductibility of mortgage interest</li> </ul>	<ul style="list-style-type: none"> <li>• Usually the second highest NPV</li> <li>• Frequently can achieve positive cash flow in Year One</li> </ul>	<ul style="list-style-type: none"> <li>• Stable power costs for term of agreement</li> <li>• Get tax benefits even though not paying taxes</li> <li>• Off the balance sheet (some lease types)</li> </ul>	<ul style="list-style-type: none"> <li>• Off balance-sheet financing mechanism</li> <li>• winery not responsible for system maintenance</li> <li>• Get tax benefits even if not paying taxes</li> </ul>
<b>Cons</b>	Ties up available cash, limiting funds for other uses	<ul style="list-style-type: none"> <li>• Must have equity available</li> <li>• Dislike of mixing business and personal finances</li> </ul>	<ul style="list-style-type: none"> <li>• Less attractive terms than home equity</li> <li>• Adds to debt load, potentially limiting extent of future borrowing</li> </ul>	<ul style="list-style-type: none"> <li>• No ownership of PV system</li> <li>• Lease payments typically greater than current electricity expense (most standard leases; see Table III for other lease options)</li> </ul>	<ul style="list-style-type: none"> <li>• No ownership of PV system</li> <li>• Better terms available to larger PV purchases (250 kW and up)</li> <li>• Small per-kWh savings and continued exposure to inflation</li> </ul>
<b>Best Suited for</b>	Those with aversion to debt who have high cash balances	Family-owned wineries that easily mix business and personal finances	Most wineries	<ul style="list-style-type: none"> <li>• Businesses with limited borrowing capacity</li> <li>• Those with strong aversion to debt/ adding assets to balance sheet</li> <li>• Those paying little/no taxes</li> </ul>	<ul style="list-style-type: none"> <li>• Large-scale projects (&gt;300kW)*</li> <li>• Those with strong aversion to debt/ adding assets to balance sheet</li> <li>• Those paying little/no taxes</li> </ul>

Table courtesy, Sunlight Electric Photovoltaic Systems  
 \*new PPAs for small systems are now available through some installers

sprinkler system to clean them. Installers need to make sure they know the products well, and that the customer understands the options and the trade-offs.

"Finally, there's the matter of the tilt, orientation, and local weather conditions. The CSI is also using this information to calculate rebates. Installers must account for local weather, and we have some fairly rigorous data to work with, but as you know, microclimates in wine country can yield some pretty different weather in one location just a few miles away from another. Be conservative in the projections, and make sure the customer knows the assumptions and what's behind them."

Pacific Gas & Electric (PG&E) has a reference center on panel performance at [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html).

Because of the three-year carry-back, wineries do not have to wait

until they file taxes for the year in which the system was installed to claim the 30% Federal Energy Tax Credit. As long as a winery has paid taxes that equal the amount of the credit, they can speed up the receipt of the tax credit by amending their filings for three years prior to the system installation. If not, they can take up to 10 years (10-year carry-forward) to claim the credit.

Finally, NPV is net present value, the financial mechanism for valuing a stream of future cash flows. For example, this principle is employed with lottery winners, when the winner of a \$100 million prize is offered \$5 million per year for 20 years, or \$68 million today. \$68 million is the net present value of the future cash flow streams of \$5 million/year for 20 years.

The following contacts can help California wineries research and understand renewable energy rebate

plans: PG&E California Solar Initiative (CSI): <http://www.pge.com/csi>; and PG&E Business Customer Center: 800-468-4743.

### Efficiency first

This is the fourth *PWV* renewable energy report. *PWV* is emphasizing efficiency. It bears repeating in this context, because:

- 1) becoming more energy-efficient **before** going solar decreases the size of the system you install, and therefore its cost; and
- 2) becoming more energy-efficient will be required as of 2008, by Public Utilities Commissions and other state agencies, before you can collect the rebates they offer against the capital cost of your solar system.

### Energy auditing

PG&E's online energy audit can be found at: <http://www.pge.com/biz/>

## SUSTAINABLE BUSINESS

Table II: 2007 Rebates, Tax credits, and Depreciation benefits in California

Incentive name/type	System size (if applicable)	Amount/ benefit	Action
CSI EPBB (Expected Performance-Based Buydown)	Less than 100kW	\$1.90/watt. Declines to \$1.55/watt at next "trigger"	Once the winery is approved for rebate, solar installer can accept rebate as down-payment on installation.
CSI PBI (Performance-Based Incentive)	<ul style="list-style-type: none"> <li>• Required if system &gt;100kW</li> <li>• Can apply to systems &lt;100kW</li> </ul>	\$1.26/per-kW-hour paid monthly for 5 years *	Entire expected rebate placed aside to guarantee funds for future payments.
Federal Energy Tax Credit		30% of <i>net</i> project costs (total projects costs less any up-front rebates paid to solar installer). Can get up to 30% of <i>gross</i> cost under some tax structures. 10 year carry-forward, 3 year carry-back.	Solar installer provides completed Federal tax form 3508.
MACRS (Modified Accelerated Cost Recovery System) Depreciation		5-year depreciation	Solar installer provides completed Federal tax form 4562.

\*as of date of this writing. PBIs and EPBBs continue to cycle down in value — check with PUC or solar installers for current rates.

energy\_tools\_resources/energy\_audit/index.html.

Gary Mercuri (PG&E's CSI group) notes that, in 2007, there were no restric-

tions on who performs an audit. It is the winery's responsibility to provide the audit, but an audit performed by a third party or by PG&E is acceptable.

PG&E offers free audits that are available online, over the phone, or in-person with a PG&E account representative. PG&E/CPUC does not pay for a third-



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party audit because the online, phone, and in-person audits provided by PG&E are already paid for by the CPUC.

Once the audit is completed, the customer can send in a printout of their online audit, a copy of an audit performed by a PG&E representative, or a copy of the audit performed by a third party. A third-party audit performed within the last three years will qualify.

If a facility had a Title-24 compliance done within the last three years, that document can be used in place of the audit.

In 2008, the CPUC plans to require that audits be performed and that recommended energy-efficiency upgrades be done in the facility before the incentive will be provided, but these additional requirements have not yet been fully determined by the CPUC.

Gopal Shanker of Récolte Energy (Calistoga, CA) is an energy consultant, and longtime advocate of both energy efficiency and renewable energy programs; he clarifies the new efficiency restrictions:

"The 2007 required energy audit is not a strenuous one," he says. "Nor has the CPUC worked out what efficiency upgrades will be required in 2008 if a

winery operation is not found to be efficient. It's a good start, to encourage energy efficiency rather than larger energy installations.

Since a winery producing solar energy and feeding it back to the utility's grid can do no better than to receive a zero-dollar annual energy bill, they

should become efficient first, and then install the smallest system which will meet 100% of the energy needs."

Shanker educates his clients on how to use energy and provides a comprehensive site-audit by a professional energy auditor, and then proposes equipment and other site upgrades

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**The Fetzer PV system covers 75,000 square feet, generating energy and insulating the roof of the red wine barrel room and the bottling facility.**

## SUSTAINABLE BUSINESS



Sunlight Electric installed Honig Winery's 819 PV panels 1/4 mile from the winery buildings, on low-productivity land not in use for vineyards.

and a move to renewable energy. His process is to apply for the rebates, do the online energy audit with his winery customer to start getting them qualified for the rebate, and then initiate the full audit.

"Yes, this method will cost the winery more in the beginning, but they will have a more robust solar system," he admits. "Sometimes the winery will have to spend thousands on efficiency upgrades, but these upgrades often

cost as much as generating solar electricity. At today's costs for PV system hardware and labor, wineries can save \$6,500 to \$7,500 on every kW they do not have to install."

Businesses that install over-large systems are essentially becoming producers of free energy to the benefit of the utility, and there is a disincentive under this plan for these over-producing businesses to become more energy efficient in future.

Shanker is lobbying legislators to repeal the restriction that says the utility companies do not have to pay for excess energy produced by a commercial customer. He argues that if the energy producer is paid even at wholesale rates for excess energy produced, more businesses would not only invest in renewable energy, but they would then have an incentive to become more energy-efficient. Even the utilities would benefit.

Shanker keeps a close eye on worldwide legislation, programs,

and the politics of green energy. He reports that more states will soon join California and Oregon by introducing strong renewable energy incentives in 2008, including Pennsylvania, New Jersey, New York, and Maryland.

Shanker told *PWV* that commercial businesses will likely be facing new taxes based on their CO<sub>2</sub> output in the near future. The Global Warming Solutions Act, passed in California in 2006, calls for statewide reductions in carbon dioxide levels. California has not yet determined how to achieve the reduction of carbon dioxide down 25% from current levels to 1990 levels by 2020. One solution, under discussion, is to tax CO<sub>2</sub> emissions. For wineries, this could mean large payments to the California government — one more reason to become as energy-efficient as possible, and to consider renewable energy production.

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**Rebates/Incentives in Oregon**

The state of Oregon now has a strong renewable energy incentive program. As of 2008, commercial PV installations can collect:

- a Federal tax credit up to 30% of the total system cost, with no cap;
- the same MACRS depreciation on their system as in California (see Table II);
- an Oregon Business Energy Tax Credit of up to 35% of eligible system cost over five years; and
- utility rebates, depending on location, of \$1.25 to \$1.50/watt for the first 30 kW and \$1.00 to \$1.25/watt for the next 20 kW, up to \$57,500 to \$70,000 caps.

Certain Oregon cities, such as Ashland, offer city utility rebates greater than the public utility rebates, free solar site analysis, and other help to businesses.

Two Oregon wineries have installed PV systems — Stoller Vineyards

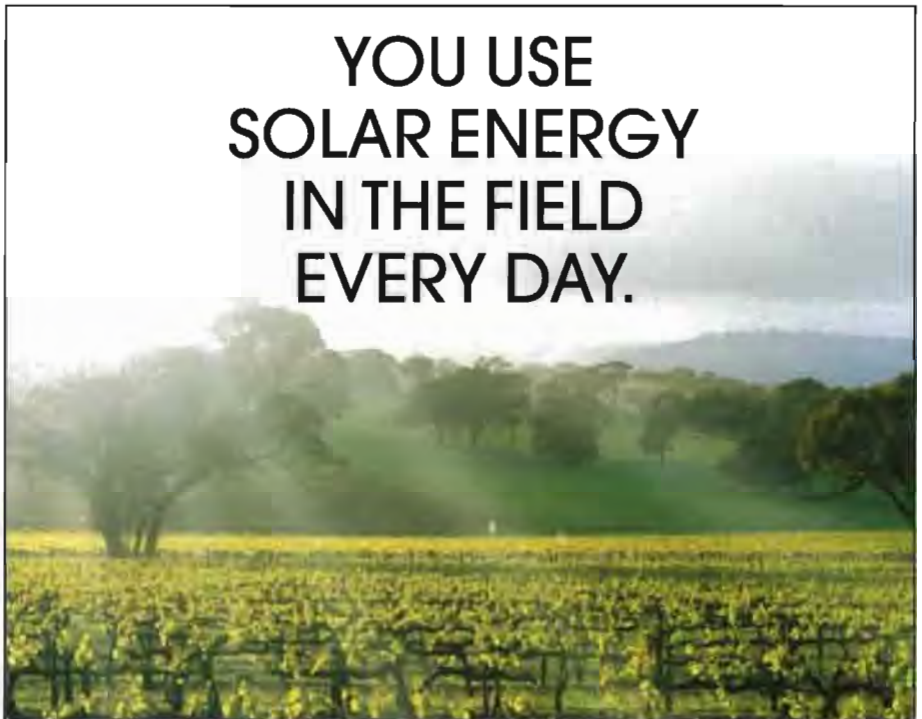
(Dayton, OR) in 2006, and Sokol Blosser Winery (Dundee, OR) in 2007.

Bill Stoller and his family completed construction of a fully-green, LEED-certified winery in 2006, and a full construction and engineering report will appear in *PWV* in 2008. Stoller's 244-panel solar energy system, installed by

Dynalectric of Portland, was an important addition to the overall Green Plan. Rated at 48 kW, Stoller reports that the system's 2006 output was higher than expected.

"We actually achieved 57 kW in 2006," Stoller recalls. "The panels turned out to be more efficient than

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Merryvale Vineyards had Novato-based SolarCraft recently cap its winery roof with state-of-the-art photovoltaic panels. The new roof provides 277kW — enough to power 100% of the winery's electric needs.

"Solar energy is good for the environment and reducing greenhouse gas is good for the community.

"With rising energy costs and generous rebates currently offered, solar was an easy decision," says Alex Gunst, Construction Project Manager of Pound Co "SolarCraft was very flexible and their professionalism was exceptional."

Besides the financial and environmental "no-brainer," solar systems for businesses qualify for:

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## SUSTAINABLE BUSINESS

anticipated, and we had sunnier weather than usual." As in California, however, Stoller's utility did not have to pay the winery for the excess energy produced.

The gross cost of the Stoller system was \$360,000. The winery received a

30% Federal tax credit, the 35% Oregon Business Energy tax credit, and an Energy Trust of Oregon rebate. Stoller financed the balance, and anticipates a 12-year payback on the system.

"The regulatory and economic climate in Oregon is very supportive of

the move to solar power," Stoller says. "The state even makes low-interest loans to companies installing solar energy; we opted not to go this route ourselves, but it serves to make the solar option more attractive (and in some situations achievable) for some companies.

"The people from the utilities — the Energy Trust and PGE (Portland General Electric) — and the consultants such as Green Building Services and Dynalectric, who deal with this on a daily basis, were the key to working around the PUC bureaucracy, and getting the construction accomplished. As the generation and use of solar power becomes more prevalent in Oregon, there are more people who know their way around the system and can help a business become more sustainable."

**Finance model: Commercial loan**

Sunlight Electric installed a 146 kW solar power system at Honig Winery

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—Mike Grgich and Violet Grgich, Grgich Hills Estate



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(Rutherford, CA) in August 2006. Sited on low-productivity land with high clay content, 819 panels and an inverter are in a field about 1/4 mile from the winery and its PG&E utility connection. Power is delivered to the utility grid through a 1,250-foot long conduit, buried 18 inches deep.

Prior to solar installation, the winery made several efficiency upgrades:

- put in a new glycol chiller with variable-drive compressors;
- downsized the main air compressor;
- installed a variable-drive water pump;

- put tinted windows, new lighting, and insulation in the front building and offices; and
- minimized artificial lighting in the fermentation rooms by using daylighting through the roof.

After upgrades, the winery determined that their solar system would have to offset remaining energy expenses of about \$43,000 per year to meet 100% of the winery's energy needs.

Since the panels were installed in a field, Sunlight Electric advised using Sanyo panels, a hybrid technology (amorphous silicon and crystalline silicon) that is much more tolerant of dirt, shading, and higher temperatures than other panel types.

In simple terms, Honig paid, by commercial loan, just 23% of the gross cost of their solar installation, after rebates and incentives. Sunlight Electric, as most installers do these days, helped winery CFO Tony Benedetti through the maze of incentives and paperwork. Of the \$1.25 million gross cost, just under \$570,000 had to be financed by Honig's lender, American Ag Credit. Erlichman notes that commercial loans are the most common financing.

On a fixed-rate loan from American Ag Credit, the winery is paying a fixed amount per month for their PV system, while paying nearly zero dollars in energy costs, which are rising for other utility customers. Honig saves more and more money each month.

Erlichman explains the rebates and tax credits that Honig Winery earned on their system: "The Honig PV system is rated at 146 kilowatts (kW). The 819 Sanyo PV modules are each rated (by the CEC) at 188.7 watts, and the Xantrex inverter is rated at 94.5% efficiency. 819 x 188.7 x 94.5%, is 146,045 watts, or 146 kW. This is the amount upon which their cash rebate was based. We secured \$2.80/watt, or \$408,927 up front, before the project started. Honig Winery was part of the older SGIP when they applied for their rebates.

"Under the new CSI rules, Honig Winery would not qualify for a cash rebate, but would receive a PBI on the power their system produces in the first five years. We project annual output of 249,475 kilowatt-hours (kWh), so the CSI PBI would be 249,475 x \$0.39, or \$97,295 per year for five years.



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## SUSTAINABLE BUSINESS

"Though that sounds like a better deal than \$408,000 up front, and it is, it's a little more complicated because of the tax implications. The PBI payments are taxable income, while the rebate wasn't, but since the 30% federal tax credit and the depreciation are based on the total actual cost of the project,

the total is now higher than before, since before you had to take the rebate out of the total paid, to calculate the 30% tax credit and depreciation. The next effect of the shift to PBIs is quickening of the payback period for PV investments, from five to seven years to four to six years."

Honig Winery took the entire tax credit on the 2006 returns, an option that suited the winery's partnership structure.

### Finance model: Cash paid

Van Ballentine, a Napa Valley grape grower for over 60 years, manages 100 acres of vineyards and his family's winery. In July 2007, SolarCraft (Novato, CA) installed an 87 kW PV system at the winery, with 512 Mitsubishi 170-watt panels on two rooftops. A 75 kW SatCon inverter sends converted power to the utility grid.

"We installed tilt panels on the south-facing barrel storage roof to maximize exposure to the sun," Chris Bunas (SolarCraft VP) explains. "The WSW-facing winery storage roof panels were installed flat as their orientation was already ideal. Besides achieving maximum panel performance, the Ballentines were pleased with the placement and aesthetics of the system."



The Ballentine Vineyards 87 kW solar system will pay for itself in just six years.

Gross system costs were \$642,384, and the net cost to Ballentine after rebates and incentives was only \$161,391, which the winery paid in cash. With no interest to pay, and offsetting nearly \$18,000 in annual utility bills, the Ballentines expect the system to pay for itself in about six years.

"Our main reason for installing a PV system is to eliminate our high electrical bills," Ballentine says. "Solar energy makes good financial sense, and the environmental benefits are an added bonus."

### Finance model: Home equity loan

Family-owned Peju Province Winery (Napa, CA) installed a 126 kW solar system with Akeena Solar (Los Gatos, CA) in late 2006. Ariana Peju calls it their "Harvesting the Sun" project. The system will power about 36% of the



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**Table III: Leasing Strategies for a sample 36kW-rated solar installation**

	True Lease (aka Tax Lease, aka Operating Lease)	Finance Lease (aka Capital Lease; applies also to Bank Loan)
Amount Financed	total system cost	total system cost
Term or Length of Financing	10 years	7 years
Purchase System at End of Term	yes, 15% to 25%	yes, \$1.00 to 20%
Federal Tax Credit Used by	Leasing company	Lessee/Borrower
Accelerated Depreciation Used by	Leasing company	Lessee/Borrower
CA Rebate (incentive) Assigned to	Leasing company	Lessee/Borrower
Customer Tax Savings Expensing	100% of lease payments	depreciation & interest
Payment Structure	usually "stepped"	usually level
Monthly Payment	\$633 plus 5 to 7% per yr (10-yr term, 25% buyout )	\$3,497 (7-yr term, 20% buyout )
Annual Total	\$7,600	\$41,960
Annual Avoided Cost	\$8,000	\$8,000
Annual Cash Flow (from) to Savings	+\$400 (5%)	(\$33,960)

Table courtesy of Mission Capital

winery's annual energy needs, and save about \$1,800/month in utility bills.

The gross cost of the system was \$926,667, offset by the rebates and tax incentives. Peju applied for its rebate under the SGIP that preceded the CSI program, and collected a flat per-watt payment rather than the CSI performance-based incentive. Net cost of the system was \$387,970, for which the family paid part in cash, financing the rest with a loan against the family properties.

Barry Cinnamon (Akeena Solar) explains that with a cash paydown and loan purchase such as Peju employed, and projected utility costs saved, a winery could get up to a 20.7% rate of return on the investment in solar energy.

"Property value is another positive financial factor when installing solar," Cinnamon adds. "According to the Appraisal Institute, energy-saving improvements can increase your property's value by \$20 for every dollar reduction in annual energy usage. In Peju's case, the value of their property was increased by \$435,000 in current dollars, which was more than the net cost of the system."

#### Finance model: Leasing

Leasing has not been adopted by wineries to finance solar installations as yet, because the common thinking was that since the winery would not own the system, they couldn't take advantage of the tax incentives. Jerry

Guffey (Mission Capital, Healdsburg, CA), however, has been working with lenders and has come up with two leasing models that will benefit winer-

ies and lenders in a leasing situation for solar.

"The key," says Guffey. "was to capture the tax benefits for either the lender or the winery, and make the situation pay off for both parties."


There are two types of leases available now to finance the capital costs of a solar installation (see Table III).

The first is called a "true lease," and applies to wineries in tax-sheltered or no-tax situations, such as S-corporations or limited liability companies. The true lease offers a lease-to-own situation where the lender can claim the rebates, tax credit, and depreciation on the system, while the winery leases the rest of the system cost on a 10-year term. With this arrangement, the lease payments can be as low as 1/4 to 1/2 of what a commercial loan payment would be.

The second type of lease is called a "finance lease" or "capital lease" for


Continued on page 120

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## SUSTAINABLE BUSINESS

### *Financing for solar energy*

Continued from page 19

wineries with tax bills that could take advantage of the tax credit and depreciation on a solar installation on their tax returns.

Guffey describes this as a "more or less standard lease arrangement" where the winery is listed as the system owner, getting both the tax credits and the rebates on their system, and financing the rest with a lease-to-own on a 7-year term. Payments on this lease are generally equal to, or competitive with, commercial loan payments.

"The longer leasing term is what makes these lease arrangements work," Guffey explains. "The more common length of a lease for other types of equipment or capital expenses is five years, but lenders agree that solar is unusual. With the large up-front paybacks from rebates and tax incentives, and the long-term financial benefits of generating your own energy, leasing can be beneficial to both lender and winery."

#### **Finance model: Power Purchase Agreement**

Fetzer Vineyards (Hopland, CA) has been implementing organic, sustainable, and environmentally-friendly practices in all aspects of its operations for many years. In 1998, before buying green energy (which was then, more expensive), Fetzer trimmed and audited, and established better energy-efficiency measures to save money. Fetzer locked in a green energy rate in 1998, and since then utility rates have increased, so the winery has been paying lower-than-market rates.

In 2005–2006, 3 Phases Energy Services (San Francisco, CA), which had been connecting Fetzer to green energy resources, proposed that MMA Renewable Ventures (a national firm that arranges financing for clean energy investments) purchase, install, and own solar panels to generate solar power on the roof of Fetzer Hopland operations buildings under a Power Purchase Agreement (PPA).

The Fetzer installation was the first project commissioned under 3 Phases Energy's Daylight Savings service, a solar energy development vehicle, enabled by third party capital and effi-

cient management of the renewable energy credits (RECs), to secure 100% renewable energy for customers at an affordable, long-term price.

The largest solar installation at any winery worldwide to date, Fetzer's system consists of 4,300 panels, located on the red wine barrel room and atop the bottling facility on 75,000 sq. ft. of rooftop, producing 1.1 million kWh/ year of energy. The business model is well-suited to large solar installations such as Fetzer needed, because the winery does not have to put up the large capital outlay for the solar system, and the size of the system pays off MMA's investment costs in energy generation.

Fetzer is buying power from a solar energy producer that just happens to be installed on its own rooftops. The array supplies 30% of Fetzer's energy needs (including 80% of the power needed to operate the bottling facility year-round) at lower-than-market, locked-in rates. An earlier 40 kW solar array at Fetzer supplies additional power needs of the Hopland operations.

MMA Renewable Ventures will finance, operate, and maintain the generation facility and sell the power to Fetzer under terms of a Solar Services Agreement (SSA) that sets electricity costs at a fixed rate. MMA sells energy to Fetzer from the array while collecting credits from PG&E at an ever-higher rate of payback. While still owning and having to maintain the system, MMA receives enough funds between what Fetzer pays, and what the PG&E market rate is, to profit.

"As one of the first and only wineries to purchase 100% clean power, Fetzer has a long-standing tradition of pioneering environmentally-sound business practices," said Susanne Zechiel, who oversees environmental programs for Brown-Forman's California Wine Group (Fetzer's parent company). "Building one of the largest solar energy arrays in the U.S. as a green power solution fits perfectly with Fetzer's business objectives and commitment to sustainability."

#### **Power Purchase Agreements for small wineries**

Until 2007, only solar installations larger than 250 kW qualified for a PPA,

because the financial terms to profit all parties weren't feasible for small solar systems. But by mid-2007, some solar installer companies had worked out their own PPA-financing for clients who needed small solar energy systems.

New Clairvaux Vineyard (NCV), a winery and vineyard in Vina, CA, is owned by Cistercian (Trappist) monks. The order believes in and tries to practice self-sufficiency, and the idea of generating the energy to operate their winery appealed to their vision. After exploring finance options that would fit their unusual corporate and tax structures, they found installer Premier Power's (El Dorado Hills, CA) "FlexFit" PPA program for small commercial installations.

In September 2007, Premier Power installed a 60 kW system at New Clairvaux, with two ground-mounted arrays to power winery operations, and one to power irrigation for NCV vineyards.

The FlexFit PPA was ideal for NCV; they can get lower energy rates while the system owner (a third party found for them by Premier Power) gets the depreciation, tax credits, and rebates on the system. NCV is going to buy power from the system owner for the next 15 years, as it is generated by the solar system on their site.

"The rate charged by the system owner to NCV under the FlexFit plan is designed so that both parties win," explains Jason Grant (Premier Power). "We find a 'true rate,' which is an average of peak and off-peak Time of Use utility rates, and then set that rate for the 15-year life of the plan, with a fixed-inflator that is still below current energy rates of inflation. NCV gets predictable energy costs for the next 15 years, and we estimate they'll save 13% compared to what they would have paid the utility company."

Installation, risks, and maintenance costs fall on the system owner. Premier Power installs a web-based monitor whereby the system owner can check the solar system output at any time. The monitoring system can let the owner know if there is significant fall-off indicating maintenance needs, and lets both parties know how much the system owner will be billing to NCV (billing is

for the energy the system produces, multiplied by the agreed rate).

"We designed the system to meet about 80% of NCV's power needs, so that they do not over-generate and have to pay for power they don't use," Grant explains. "When NCV uses more energy than they are generating, they'll pay the system owner for what the solar system produced, and the utility for any power coming from the grid in excess of that.

"What we needed to avoid, since the system owner is getting paid by the utility only for up to 100% of the winery's energy use, was a system that produced more than 100% of NCV usage. That situation would not benefit either NCV or the system owner."

### Summary

As more wineries, other businesses, and individuals adopt solar energy self-generation in the U.S., utility companies will have so many tiny little power plants feeding energy to their grids that brown-outs could become a thing of the past — along with utility bills. ■

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The annual event is an Oregon platform for industry research and education, delivering relevant content to wine and winegrape industry professionals. Sponsored by the Oregon Wine Board, the Symposium brings wine and wine grape leaders from around the world to discuss issues, discover key research, and network with industry suppliers.

To register, book lodging and view the schedule, visit [www.oregonwine.org/symposium](http://www.oregonwine.org/symposium). If you have any questions about the symposium, contact Katie Stoll at [katie@oregonwine.org](mailto:katie@oregonwine.org) or 503/228-8336 x 27.

### FEBRUARY 14-16 COLD CLIMATE GRAPE & WINE CONFERENCE HOLIDAY INN SELECT, MINNEAPOLIS, MN

The Minnesota Grape Growers Association (MGGGA) host the conference to focus on the business of growing grapes and making wine in the northern United States. Sponsors include the MGGGA, a Minnesota non-profit organization whose purpose is to further the art and science of growing grapes in cold climates, and many other mid-western state grape-growing associations are contributing to and partnering in this event. The conference goal is to provide a central home to share information related to cold-climate winemaking and grapegrowing. This "regionally unique" conference will draw attendees from many northern states including Illinois, Iowa, Wisconsin, North Dakota, South Dakota, Nebraska, Minnesota, and Canada.

For more information, go to: [www.mn.grapes.org](http://www.mn.grapes.org) website.

### FEBRUARY 21-22 11TH ANNUAL CENTRAL COAST VITICULTURE & ENOLOGY ISSUES CONFERENCE EMBASSY SUITES, SAN LUIS OBISPO, CA

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Information Line: 559/278-5391. Visit <http://cast.csufresno.edu/ve>.

### THURSDAY, MARCH 20 RECENT ADVANCES IN VITICULTURE & ENOLOGY UNIVERSITY OF CALIFORNIA, DAVIS, CA

8:45AM-4:45PM

The morning sessions will emphasize the results of recent applied research in wine microbiology. A presentation on the most recent research on *Brettanomyces* will cover fermentation management strategies to reduce undesirable characters, and end with a noses-on experience into the many ways that *Brettanomyces* characters can be manifested. A microbe will be introduced whose name you'll certainly recognize, but whose presence you thought was harmless in wine. Because of new technology, we are able to isolate and identify organisms that the methodology did not allow to be seen before, thus giving a whole new perspective of the organisms on grapes and in wine.

The afternoon sessions will focus on exciting work being done in the UCD vineyard. Speakers will address new information on rootstock selection, weed management, and the possible use of a plant hormone to minimize berry damage during mechanical harvesting. Other topics include recent work with Cabernet Sauvignon to determine whether thinning really improves fruit quality; the influence of soil type on vine growth and fruit characteristics; an update on berry size and wine quality, plus news on vine-water relations from a new USDA specialist.

Cosponsors are UC Davis Department of Viticulture & Enology and the Trellis Alliance. The \$220 enrollment fee includes lunch, sensory evaluation, and one-year membership in the Trellis Alliance. To register for RAVE 2008, please see <http://extension.ucdavis.edu/unit/winemaking> or call UC Davis Extension 800/752-0881.

### SATURDAY, APRIL 19 EARTH DAY FOOD AND WINE FESTIVAL SANTA MARGARITA DE CORTONA ASISTENCIA SANTA MARGARITA, CA

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