



CASE STUDY—MATHIAS RESIDENCE—SEBASTOPOL, CA



Jeff purchased his Sonoma County home in July 2007 and in **March 2008** chose to **install a 5kW** (kilowatt) photovoltaic (electric) solar system. Fortunately for Jeff the doors to **SCEIP ([Sonoma County Energy Independence Program](#))** had just opened. His solar project was one of the 1st funded through this unique financing mechanism. He also received a **[30% federal tax credit](#)** which is currently available to property owners installing solar (PV or thermal) and a solar rebate through the **[California Solar Initiative](#)**.

As you will see in this study, Jeff became familiar with efficiency and renewable measures applicable to his home and usage needs THEN implemented changes gradually. Utilizing a local financing mechanism fixed to his property, while taking advantage of available rebates and tax credits helped to pay for these upgrades.

Goals

- Cut electric bill and eventually zero out costs (was paying \$200/month electricity)
- Reduce monthly gas costs (was paying \$170/month gas)
- Minimize drafting throughout home
- Use appliances and lighting that is energy efficient



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Solar and Efficiency Measures

2008

- Energy efficient lighting
- Compact fluorescent lighting (CFL) in hallways, dimmers on fixtures
- Low voltage lighting
- Solar attic fan

2009

- Replaced old wood stove with new high biomass wood stove ([federal tax credit available](#)) and went from burning 2.5 cords to 1.5
- Replaced refrigerator to energy star rated appliance ([PG&E rebates available](#)) **Don't forget you can [recycle old appliances](#) too!*

2010

- Replaced single-pane skylight with double paned skylight
- Replaced dryer and dishwasher with energy star rated units ([PG&E rebates available](#))
- Added 12" blown in insulation to attic to minimize drafting (used rest of 30% federal tax credit for this,) [PG&E rebates available](#)
- Replaced old gas furnace with new 95% energy efficient furnace including smart thermostat ([PG&E rebates available](#))
- Replace old gas water heater with on-demand energy efficient model ([PG&E rebates available](#))
- Repaired heater vents (learned through this process that vents were shooting heat underneath the house)
- Insulated pipes

2011

- Installed home energy monitoring system—Tracks solar production as well as circuits throughout the house compared to PG&E schedule he uses. He uses this system to determine phantom loads, how many kW each circuit uses and when to determine further savings and what it costs him.



Fig. 1—12” blown insulation added to attic (left)



Fig. 2— Replaced old gas heater with on-demand energy efficient model. (above)



Fig. 3— Replaced old gas furnace with a new 95% energy efficient furnace with a smart thermostat. (above).



Fig. 4— Replaced old wood stove with new high biomass wood stove taking him from 2.5 to 1.5 cords (above)

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Fig. 5— Solar panels up close and personal. Jeff helped to install his own system.

Fig. 6— Installation process at Jeff’s house.

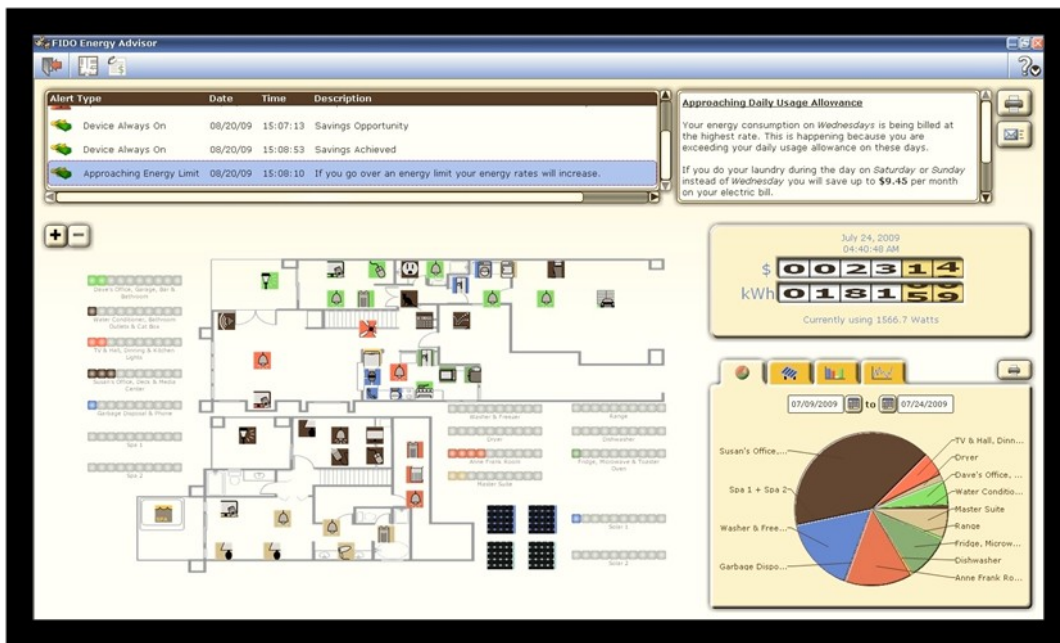


Fig. 7— Sample computer live report of home energy monitoring system.



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Summary of measures

Solar Savings

- 2007 Pre-solar install: \$200/month on average for electricity
- 2008 Post-solar install: \$66/month on average including post-solar additions: hot tub and new tenants (potential electric increase estimated \$100/month)
- 2009 Solar addition—1kW (6 panel) added in order to zero out electric bill

Efficiency Savings

- Pre-efficiency measures—\$170/month average for gas which was supplemented by burning 2.5 cords wood for heat. He currently burns .25 cords/year
- Post-efficiency measures—\$50/month average for gas

Note: Jeff sets his thermostat and uses the heater almost exclusively instead of his wood stove.

- With his home energy monitoring system, Jeff continues to learn about his house as a system in order to determine best practices for changing his overall occupant behavior. **Keep up the good work Jeff!**

For more information on how you can save like Mr. Mathias and take advantage of other resources in Sonoma County contact your Clean Energy Advocates at:

Phone: 707-543-3886 • www.srcity.org • Email: CEA@srcity.org

Resources

[Solar Sonoma County](http://www.solarsonomacounty.org)—707-284-9799, info@solarsonomacounty.org

[Sonoma County Energy Independence Program](http://www.sceip.org) (SCEIP) 707-565-6470, sceip@sonoma-county.org

[California Solar Initiative](http://www.solar.pge.com) (CSI) - 1-877-743-4112, solar@pge.com

[Energy Upgrade California](http://www.energyupgradeca.org) (EUC) - program@energyupgradeca.org