



Community
Environmental
Council

Driving on Sunshine

Powering your car with the sun is easy and affordable

Jeff and Mandy Phillips

SANTA BARBARA



Expenses before driving on sunshine:

Auto loan: \$475/month

Gasoline: \$300/month

Utility bills: \$30/month

Total: \$805/month

One-time expenses:

Down payment on Nissan Leaf lease: \$1,999

(he received a rebate check for \$2,500 from the State shortly thereafter)

Down payment on the solar panel loan: \$1,000

Total: \$500 (after rebate)

Current expenses:

Auto lease: \$260/month (he upgraded to 18,000 miles/year)

Home solar system loan: \$300/month

Utility bills: varies with seasons but on average for the year, near zero.

Total: \$560/month

Total Savings: \$245/month

Type of Electric Vehicle	Nissan Leaf
Leased or Purchased	Leased
Size of Solar Array	3.36 kW DC (14 SunPower 240 W panels & Enphase microinverters)
Solar Installer	California Solar Electric
Leased or Purchased	Purchased
CEC Solarize Participant	No

Jeff and Mandy Phillips are always looking for ways to ease their impact on the environment. When Jeff heard there was a special on the Nissan Leaf that would make it possible for him to drive a brand new zero-emissions vehicle and save substantially on his car payment, he signed a lease the next day. Soon after, he crunched the numbers and found that, with an electric vehicle to charge, putting solar on his home finally made economic sense.

Jeff drives from his home in Santa Barbara to his job in Ventura five days a week -- a 70-mile round trip commute that he used to do in a Ford Escape hybrid. **While the environmental benefits of the Nissan Leaf were an important reason for his switch from hybrid to electric, it also proved to pay off – with estimated savings of about \$245 a month.**

Going solar was something Jeff and Mandy always wanted, but with a small home and a low utility bill it didn't make financial sense. Now, for what they used to pay in monthly gasoline expenses, he is charging his car, paying their utility bills, and paying off the solar loan they financed the panels with. After five years, the loan will be paid off and the Phillips family will enjoy at least 20 years of free electricity to power their home and car. "It's exciting to make such a huge change and also have it make total economic sense," he says.

Jeff likes leasing the electric vehicle because it allows him to try out this relatively new technology for three years before committing to a new purchase. Does he anticipate keeping an electric car after his lease is up? "Definitely. I love it". He says the car is fun to drive and performs better than a gas-powered car,

cornering nicely and with plenty of torque. Match the fast acceleration with the lack of motor noise and "it's like being in a rocket ship." Jeff says the quiet ride means phone conversations are easier and music sounds better - a bonus on his long commute.

The Leaf is smaller than his Escape was so it helps that Mandy has a Toyota Prius hybrid which they've made "as close to an SUV as possible" to accommodate their recreation-intensive lifestyles. He's added a trailer hitch to attach a bike rack, a roof rack for surfboards, and a storage box for camping gear.

Jeff encourages those who are on the fence about making the switch to a plug-in car and solar power to take a second look at the numbers. "A lot of us have the desire to be environmentally-conscious or reduce our carbon footprint, but we don't have a ton of money to pay for it and have been waiting until it all adds up economically. But that day is here. People may not realize it, but take a close look at the cost and you'll see. The time is now."

Michael Chiacos

SANTA BARBARA



Electric vehicle:

Down payment: \$1500 (He received the \$1500 CA rebate check)

Monthly lease: \$355

Approximate monthly gas savings: \$50/month

Solar:

Cost: \$7,500 (after state and federal incentives)

Energy bill before solar: \$90/month

Charging costs: With time-of-use billing from SCE, car often charges super off-peak for 9 cents/kWh. Solar credits come in at up to 46 cents/kWh during daytime on-peak hours

Payback period: 6-7 years, or faster if car mostly charges at night

Solar is projected to produce over \$55,000 of electricity over 25 years if rates increase at historic average of 6%/year

Type of Electric Vehicle	Chevy Volt
Leased or Purchased	Leased
Size of Solar Array	2.88 kW DC (12 panels)
Solar Installer	California Solar Electric
Leased or Purchased	Purchased
CEC Solarize Participant	No

Michael is CEC's Energy and Transportation Manager and because of his work to help prepare the Central Coast for a large number of electric vehicles, he had been eyeing the new electric cars starting to come to market. Then last year, the 1998 biodiesel Volkswagen that he shared with his girlfriend Sarah became less reliable. After repairs and much debate they decided to lease a Chevy Volt. Then they saved up enough to install a rooftop solar system that was large enough to zero out their monthly electricity bill and charge their new electric car.

Before getting an electric car, their electricity bill was small at \$40 a month. So, while going solar was something they had wanted to do for environmental reasons, they wouldn't see much financial payback. However, once they added a Chevy Volt to their household the bill increased by around \$50 a month and they were pushed into Southern California Edison's more expensive Tier 3 electricity rates. Suddenly solar power jumped to the top of the home improvement list, especially considering they could switch to time-of-use rates and charge the car inexpensively at night while getting credited for valuable daytime peak solar power.

Their 2.88 kW solar system from California

Solar Electric cost \$7,500 after incentives. The payback is six to seven years (but may be faster if they mostly charge the car at night). And with a 25-year warranty on the solar panels they'll be able to power their house and an EV for free for decades. **If electricity rates continue increasing at the historical average of about 6% a year, then the system should produce enough clean electricity to save them about \$55,000 in electricity bills over 25 years. The panels have also increased the value of their property.**

Their Chevy Volt combines the best of an electric car's efficiency (getting 100 mpg equivalent with zero tailpipe emissions) with the long distance range of a hybrid. By charging overnight off a regular 120-volt outlet, the car can go 38 miles on electricity. On occasional trips to neighboring cities like Ojai or Ventura, they use public charging stations, which enables them to travel 75 miles a day in electric mode. They often go a few weeks without using a drop of gas. On longer trips the gasoline range extender kicks in, allowing them to achieve around 40 mpg for over 300 miles before they need to refuel.

By leasing their Volt, the dealer was able to pass through the \$7,500 federal tax credit, which Michael didn't have enough tax liability for. The \$1,500 California rebate covered the down payment, first month, and registration. With these incentives, they have a lease payment of \$355 and they save on gas. Their Volt is nicely appointed and quite luxurious, filled with great technology and fun to drive. Once, Michael even saved the day by unlocking the car remotely from his smartphone app when Sarah had locked the keys in the car.

With the new time-of-use pricing from Southern California Edison, they can charge their car at night for 9 cents per kWh using inexpensive off-peak power. Meanwhile, their solar panels generate valuable daytime peak power, which is credited to their bill at up to 47 cents per kWh in the summer. In short, they are buying low and "selling" high. Charging an electric vehicle at night is equivalent to paying less than \$1 a gallon in a 30 mpg gas car. While they never previously considered leasing or even buying a new car, they like moving the EV market forward with their purchase while knowing they won't be spending money on repairs.

Michael and Sarah were very excited to discover that having solar and an electric car were possible on an average middle class income and the feeling of Driving on Sunshine is priceless.

Mark Stegall

SANTA BARBARA



Expenses before driving on sunshine:

Auto lease/loan: \$0
Gasoline: \$110/mo
Utility bills: \$55/mo
Vehicle repair/maintenance cost: \$100/mo (\$1200/yr)
Total: \$265/month

One-time expenses:

Purchase Nissan Leaf less rebates/tax credits: \$26,300
Purchase/Installation of the solar panels less rebates/tax credits: \$13,600
Total: \$ 39,900

Current expenses

Auto loan/lease: \$0
Home solar system loan/lease: \$0
Electric vehicle yearly service cost: \$10/mo (\$120/yr)
Utility bills: \$0

Type of Electric Vehicle	Nissan Leaf
Leased or Purchased	Purchased
Size of Solar Array	3.68 kW DC
Solar Installer	Sun Pacific Solar Electric
Leased or Purchased	Purchased
CEC Solarize Participant	Yes

Mark Stegall drives his car with zero carbon emissions, zero gas costs, and zero monthly electrical bills. An electrical engineer and longtime Santa Barbara resident, Mark describes his motivations for being the sixth electric vehicle owner in Santa Barbara and for going solar.

In 2010, Nissan introduced its first all-electric vehicle, the Leaf. Mark was waiting with open arms after having already secured a reservation and placed a pre-order months before. "When Nissan made the Leaf," he says, "the only other EV was made by Tesla. And that was an \$110,000 car." Even so, he admits that the Leaf was expensive – coming in it at \$26,300 after rebates and incentives.

Despite the cost, Mark argues that the car is economical because it eliminates the need for gas, oil, and other part replacements (such as oil filters and fuel pumps) that accompany any fuel combustion engine. "When you look

at our Leaf combined with solar, we won't pay for an electric bill for the rest of our lives, and we barely pay for gas." Mark's solar panels allow him the luxury of driving on sunshine.

Through the CEC's Solarize program, Mark purchased a solar system large enough to provide electrical power to both the car and home he shares with his wife. Additionally, he switched to Southern California Edison's time-of-use EV billing rate so that he actually receives credits from the utility when he generates more electricity than he is consuming. Since the credits are worth more during daytime peak hours, Mark charges his Leaf at night (when the electricity is less valuable), using some of the credits earned during the day to pay for the power. Mark calculates that for the next 25 years, this practice will not only eliminate his electric bills but produce enough extra credits to last him for years.

"There were environmental reasons to do it, economic reasons and national interest reasons," he says. Aside from his financial and environmental justifications, "getting rid of our dependence on external resources reduces the need to place ourselves overseas."

Moreover, the price of oil does not account for the negative financial, environmental and social consequences that are produced from oil dependence.

"All these things will change in time. The biggest problem is educating people," he says. Mark believes that people will move toward electric cars, especially in Santa Barbara. "It is the ideal city to have an electric vehicle" for two reasons: the temperate climate is optimal for prolonging battery life, and the geography allows for most commutes to be within 30 miles, well within the 73-mile range of his Leaf. Mark is doing what he can for the environment while also considering his finances. "Plus, I am a believer that individual decisions can make a difference."



Tim Foraker

LOS ALAMOS



Annual savings in PG&E bills: \$2,100
Annual savings in gasoline bills: \$2,500
Total Annual Savings: \$4,600
Net cost of 7.0 kW solar array through the Solarize program: \$21,293
Payback period: 4.62 years

Type of Electric Vehicle	Ford Fusion EV
Leased or Purchased	Leased
Size of Solar Array	7 kW DC (28 CentroSolar 250 W panels and Power One Aurora Inverter)
Solar Installer	Solarponics
Leased or Purchased	Purchased
CEC Solarize Participant	Yes

Tim Foraker knows numbers. A financial professional at Edward Jones, Tim is well-versed in the language of investments, returns, and financial risk. After a nephew informed Tim about the tremendous monthly savings he was seeing after going solar, a light switched on in Tim’s head. Faced with monthly electric bills around \$200 for his Los Alamos home, solar could make financial sense for him and his wife, Joy.

However, it wasn’t until Tim heard about the Solarize Santa Ynez Valley program that he seriously began to look into solar power and electric vehicles. Tim attended a Solarize workshop put on by the Community Environmental Council and the Santa Ynez Valley Alliance and immediately signed up for the Solarize program. The next day he had an appointment with a solar consultant.

Todd Burnett, an Energy Analyst at Solarponics recalls his first meeting with Tim, “I’ve never met a homeowner who was so well prepared.”

Tim arrived with spreadsheets of his historic electrical usage and had even calculated the charging requirements for the electric vehicles he was considering. Todd continues, “Tim basically designed his system himself. He knew how much electricity he would need to generate and had even mapped out where on his roof the panels would be situated.”

Tim approached his financial analysis of combining solar and an EV with the same attention to detail. He began mapping out his savings in both electrical and gasoline bills. After crunching the numbers Tim describes, “Our incentive to go solar was purely a financial one. I calculated that my investment in solar and switching to an EV would pay for itself in less than five years.” Tim opted for a 3-year lease on an all-electric Ford Fusion which he helped pay for with the sale of Joy’s

Lexus LS 400 which had been costing \$2,500 a year in gasoline alone.

Tim and Joy calculated that their annual rate of return from switching to solar and an EV is better than 20 percent. Given the warranties and production guarantees of the panels, Tim sees the decision to go solar as a “risk-free investment – and in this day and age there are no risk-free investments, particularly one with a 20 percent annual return!”

Since going solar, Tim has been a great advocate for solar power and driving on sunshine, educating his friends and family and referring them to CEC’s Solarize programs. When asked how he feels about “driving on sunshine”, the Tim’s inner financial professional shines through. “I am delighted with this investment!”



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