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MAUI ELECTRIC VEHICLE ALLIANCE

I Am "Driving the Future" with An Electric Smile

July 2012

by Christine Andrews

My husband and I own a small hotel in Maui. Electricity for our hotel and gasoline for our vehicle fleet is one of our biggest and most unpredictable costs. In Hawaii, we not only have the highest gas prices in the nation, we also depend on oil for most of our electricity. Fluctuations in the price of oil globally can have a big impact on electricity and gas prices locally. Spikes in oil prices can mean not paying the bills.

During the recession, while our revenue took a dive, spikes in oil prices caused our electricity and gasoline bills to shoot up. I got worried enough that, in the summer of 2011, I took some classes through the University of Hawaii Maui College's Sustainable Living Institute of Maui to see if there was anything more I could do to save on electricity and gasoline. While learning new ways to save energy, so we could stop being victims of every spike in oil prices, I also learned that Maui has abundant supplies of low-cost wind and solar energy. Most importantly, I learned that experts believed that, in the future, it would be possible for electric vehicles to store this wind and solar energy. Electric cars and renewable energy could work together to free me, Maui, and Hawaii from the economic uncertainty caused by relying on oil for energy and transportation. It sounded like a great idea, but when would this future arrive? Much sooner than I expected.

In November, I learned about the University of Hawaii Maui College's MauiEVA (Electric Vehicle Alliance) Project. I attended a Project meeting in February, and learned that there were already a bunch of electric vehicle charging stations on Maui. Not only that, but by March, Hawaii was expected to lead the nation in the number of electric vehicle charging stations per person! The U.S. - Japan Smart Grid project was also coming to Maui, with millions of dollars to invest in upgrading our electric grid for improved integration of renewable energy and electric vehicles. The all-electric Nissan Leaf had just passed its first year on the market and demonstrated it was a reliable electric vehicle technology. A local rental-car company, Bio-Beetle, even had a Nissan Leaf available for Maui visitors and residents to rent.

The future had arrived! For me, embracing this future meant going all the way. I wanted freedom from my gas minivan, which was feeling more like a gas monster. I was ready to go all-electric, which in Maui, in February, 2012, meant the Nissan Leaf. But would it work for me? My family drives about 70 miles a day, way more than the average Leaf owner, and a lot of it up some serious Maui mountains. We are a two car household, but we wanted our all-electric to be able to take everything our daily drive could dish out. No dealer test-drive was going to give me that answer. I turned to Bio-Beetle Car Rental and rented their red Leaf. When I arrived to pick-up my rental, the Bio-Beetle folks showed me the car: the on-off button (which plays a tune when you turn it on), the cool toggle gear shift, the on-dash display showing how "full" the battery is. They showed me how to use the Level 1 charger that comes standard with the car, and which I could plug in to a regular three-prong plug in my garage to charge the car. The kids hopped in and we drove away. Silently. For me and the kids, it was love at first drive. Was love enough?

When we got home, I left the Leaf in the driveway so the neighbors could see it. I wanted the neighbors to see how cool I, I mean, it, was. I sat in my living room to eavesdrop on the curious and excited comments through my open window. "Wow!" "Is that the electric car?" "Check it out." The kids took pictures of it and posted them to Facebook. After 9 pm (i.e. after peak grid demand), I pulled the Leaf in the garage, popped the charging cap on the hood, took the Level 1 charger (like a big laptop charger) from the hatch, plugged it in my garage's three-prong outlet, and plugged in the car. Then, and this would kill you in a gas car, I turned the car on in my closed garage, and played with the on-screen display (navigation, charging, energy use, Bluetooth) for hours. I read the Owner's Manual and the slim Maintenance Schedule cover to cover. I learned that, for the first 100,000 miles, maintenance consisted of rotating tires, checking brake fluid, and changing the air filter for the climate control. The reduced maintenance needs of electric cars are part of what makes them have a lower total cost of ownership than traditional gas cars. I am happy that, since it needs no oil, I do not have to trouble with oil changes.

The real moment of truth was seeing how it drove when I took the kids to school the next morning. Wailuku Heights to Makawao and back. Thirty-four miles round trip, about 12 miles of it on the highway and pretty much straight up hill. The car was a marvel. I raced it uphill at over 70 miles per hour, passing every car on the road, just because I could. It felt like driving a spaceship. The kids were amazed, "We're driving the future!" We all had the trademark Electric Smile as we pulled up in front of school. I spent an hour in the school driveway answering questions about the Leaf from excited teachers and parents.

While I had it, my rented Leaf proved it could more than handle my driving needs. When I dropped the kids off at school the following day, I told them I was going to buy one. When I picked them up from school in my same old minivan that afternoon, they were disappointed. "Where's the Leaf?" This happened back in February, when you still had to order the Nissan Leaf on-line. When I placed my order, the NissanUSA website said estimated time of delivery was May (3 months away!). That’s no longer a problem for current purchasers. Since March, the Nissan Leaf has been available nationwide. Since May, it has been available on showroom floors, no more pre-ordering online. By the end of the year, the Nissan Leaf will be made in America, at Nissan’s new Tennessee plant.

Back when I ordered mine, the wait for delivery got frustrating, not only because I do not like to wait. When I placed my order, there was also still a Hawaii state rebate of $4,500 per applicant for an electric vehicle. As the months went by while I waited for my Leaf, I watched the Hawaii EV rebate funds diminish to almost nothing as other EV owners got their rebates. Due to the availability of Federal funds, the rebate fund was replenished in March, but it immediately began to diminish again. I had ordered a red Leaf, to lease (as a hedge against technology changes), and the rebate was good for a lease or purchase. This $4,500 (in addition to the $7,500 federal tax credit) was a lot of money. It was not the deciding factor in my choice to go electric, but it did play a role in my analysis. Now that rebate was quickly disappearing as funds depleted. I started calling around other dealers in the state looking for one to get before the rebates ran out, but there were none available anywhere. Our Maui dealer had one, with a $10,000 dealer mark-up. My husband even visited Leaf dealers in California during a trip there. The Hawaii state rebate funds were going...going... By happy coincidence, on the morning of the MauiEVA Plug-In Maui conference in April 2012, the local Nissan dealer called to tell me that their demo Leaf had been released for sale. It was priced at MSRP. It was black, available for purchase (not lease), and waiting for me. I ran down, bought it, and brought it back to the conference in time to take four people out for a ride.

Was it soon enough for me to get the rebate? The good news, so many people were going electric that rebate funds ran out months ahead of schedule. The bad news, after buying my black Leaf instead of waiting a few weeks for delivery of the red one I had ordered for lease, a decision I made entirely to try to capture the $4,500 rebate, I did not get a rebate. Rebate funds ran out on May 2, the day I submitted my rebate application. While I love my black Leaf, if I had known I would not get the rebate, I probably would have waited for the red Leaf I had ordered for lease.

Rebate remorse aside, our black Leaf has exceeded expectations. While we still have our second, gas, car, we coordinate to use the Leaf for most of our driving. We drive it about 2,000 miles a month, and pay about an extra $200 in electricity to power it for those miles. We average about 4.6 miles per kWh, which comes to about ten cents per mile at standard Maui electricity rates. This represents a savings of about 75 percent over our old gas car. Nissan recommends, for battery life, to only charge the Leaf up to 80% of its battery capacity, which we do. Therefore, we also need to charge it during the day to meet our driving needs. When I analyzed the residential EV charging rate offered by my utility, a time-of-use rate which only offered a discounted rate from 9 p.m. to 7 a.m. and which required installation of a Level 2 charger (an investment of about $1,500), it did not seem cost-effective for our family. Our utility's residential and commercial EV charging rates could work really well for others, especially people who drive 35 miles or less a day, or people who have PV systems, which we don't.

We average about 70 miles per day using the Level 1 charger Nissan provided with the car. Relying on slower Level 1 charging has it's limitations, but for now it works for us. I want to wait until the next-generation EV chargers are available in the U.S. before making the investment. Nissan recently announced its new PowerStation, a vehicle-to-home system for the Leaf. This new product, now available in Japan, will be able to draw power from a standard household outlet and charge my Leaf faster than the currently available Level 2 chargers. It will also be able to power my home as a back-up power supply. Toyota and Mitsubishi have developed similar vehicle-to-home systems for their electric vehicles. These represent the charging of the future that I am waiting for, because they can help Maui bridge its peak energy demands and integrate more renewable energy. I am also planning on installing a solar energy system, so that I can take advantage of both net-metering and EV-charging time-of-use rates while using my Leaf to store cheap, clean, renewable solar power, and drive for free. That future is on our doorstep. When it arrives, I will truly be, as my kids call it, "Driving the Future."

Lessons Learned:

1. Before deciding to buy an all-electric, see if you can rent it or borrow one for a day or two. It will help you overcome your "range anxiety" if you test it on your common driving routes, using your typical driving styles, a few times before you make the purchase decision. On Maui, Bio-Beetle Rental Car and Enterprise Rental Car have Leafs to rent. Enterprise has Leafs in Honolulu, too. Since Leafs qualify for HOV lane, get free parking, and there is no need to refill them at return, they make a great rental car option for your next Honolulu trip.

2. There are new makes of electric vehicles and plug-in hybrid electric vehicles becoming available for pre-order or at the dealership all the time (in July, 2012, the Ford Focus Electric, Honda Fit Electric, and Tesla Model S have all been launched). The Clean Cities and Plug In America websites have

great information on all current and future vehicles. Do your research and contact local or neighbor island dealers to see if and when what you want will be available. For example, the Toyota Plug-In Prius was not listed on the Toyota website as available in Hawaii, but some were available at the Maui dealership anyway.

3. Most manufacturers warranty their battery packs for eight years or 100,000 miles. If you are not sure if you are ready to commit to purchase an electric vehicle, leases (when comparing fuel, maintenance, and incentives) are a cost-effective option. If your area has bad traffic (Honolulu has the country's worst), the time you may save with the available single-rider HOV lane access for electric vehicles makes them an attractive option.

4. While the Hawaii EV Rebate has ended, public policy in favor of electric transportation means new state and federal incentives may come out at any time. Most manufacturers of electric vehicles and plug-in hybrids keep up-to-date links on existing incentives right on their websites.

5. Charging is getting easier and you may not need a Level 2 charger at home. If you drive less than 35 miles per day, you might be able to go without investing in the more expensive Level 2 charger, and just stick with a standard outlet and the Level 1 charger that comes with the vehicle. If you are ready to invest in Level 2, the manufacturers the process easy, they all have Level 2 manufacturers and installation providers under agreement and ready for you at any stage of the purchase process (before and after you take delivery of your vehicle).

6. Check your utility bill and think about your usage before choosing your utility's EV charging or time-of-use rate. It may not always be the most cost-effective for you. New charging options are coming out all the time and costs are expected to go down. If you have PV or other self-generated electricity, electric vehicles really could give you free transportation. You can have both net-metering and EV charging time-of-use rates which, combined, could reduce your energy and transportation costs to next to nothing.

About the author:

Christine L. Andrews, J.D. is a Member-at-Large of the Maui Electric Vehicle Alliance and a Maui small business owner. Ms. Andrews was a founding consultant and Project Manager of Maui Economic Development Board's Women in Technology Project. The Project was the first workforce development program of its kind funded by the U.S. Department of Labor to promote increased participation by women in the science, technology, and engineering workforce. Ms. Andrews' work in the field has been published nationally and internationally. More recently, Ms. Andrews has focused public policy and program development related to the integration of energy efficiency, renewable energy, and clean transportation as primary components of a sustainable future for Maui residents and visitors.

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