



*A New Way to*  
**Cruise**  
*Around Colorado*

Compiled and edited by Kathryn Lisk

**B**oulder County has always been ahead of the curve when it comes to sustainability, so seeing hybrids or electric cars around town is fairly common. However, some individuals have found their own way to limit dependency on fossil fuels when it comes to transportation. From motorcycles to Volkswagen Beetles, creativity and innovation in transportation unite the following three stories.

### “El Ninja”

By Chris Rathweg

I have always been energy conscious, but with global warming and the near collapse of our financial systems, I decided it was time to get serious. I started with a home energy audit, followed by sealing, insulating and a new furnace. Next came a PV electric array and a solar domestic hot water system. Finally, my 27 miles per gallon vehicle was the focus. I heard of a local person who sold a guide on how to build “El Ninja,” an electric motorcycle. Having owned motorcycles in the past, I decided that sounded like fun.

Including the motorcycle, the whole conversion cost me around \$4000. I did my best to keep the costs down, because I really wasn't convinced it would work for me. My daily commute from Louisville to Arvada is 14 miles one way with many 5% grades sprinkled along the way. The bike would need to keep up with typical rush hour speeds.

I bought a 1997 Kawasaki Ninja with a blown engine. Six deep cycle marine batteries fill the space where the engine was. A DC electric motor drives the rear wheel via chain and sprockets. An electronic controller and a battery charger are also installed. Doing a conversion yourself is definitely not for everyone. It must be done well for the result to be a safe, roadworthy vehicle. Several manufacturers now sell electric motorcycles, and many more will be available soon. For me, it's been a real learning experience. More than once, I've needed my wife to come rescue me with our pickup. Now that I've solved those early issues, I just love my electric motorcycle. It's quick and responsive from a stop, and at the top end, I can exceed the speed limits on my commute. I charge it while I'm at work, and then again when I get home. Each charge uses about 3.3 kWh of energy, which is about 33 cents worth of power. My charges are all from PV generated power, so my transportation is completely solar powered. Besides all that, it's much more fun than my old gas vehicle.

Chris Rathweg



### 100 Miles Per Gallon

By Brian and Debbie Slobe

We held off as long as we could to replace our 17-year-old car, hoping plug-in hybrid electric vehicles (PHEV) would come on the market before it died. This January, tired of waiting for car companies to put PHEVs on the road, we took matters into our own hands and set out to find an independent source.

Turns out there are a handful of innovative companies who were as fed up with waiting as we were and had developed battery conversions for the Toyota Prius that would transform it into a PHEV that could get 100 miles per gallon. The most affordable conversion we found was through Massachusetts-based Hymotion, and lucky for us, the company had set up a certified installation center at Burt Toyota in Englewood. There, we bought a used 2007 Prius and Hymotion conversion for about the cost of a new Prius with all the works. Better still, if you buy a car and conversion at the same time the total cost can be rolled into one financing package.

New state rebates make PHEV conversions more affordable than ever starting Jan. 1, 2010. House bill 1331 passed this year allows a tax credit of up to 85 percent (goes down to 75 percent from 2012 to 2015) of the cost of the conversion, up to \$6,000.

For us, buying the conversion was a no-brainer as we could charge the car off the electricity generated from our rooftop solar photovoltaic system, reducing the payback time of that investment. A full charge uses five kilowatts and lasts about 30 miles, perfect for around-town driving and jaunts between Louisville and Boulder or Denver. Once the charge is depleted, the regular Prius engine/battery kicks in automatically. You are never ‘stranded’—the car uses both an electric and gas motor just like a factory Prius.

Brian and Debbie Slobe





## “PlugBug”

By Chris Doran

I started looking into electric cars out of curiosity when gas hit 4 dollars a gallon. By chance I stumbled across the information that the State of Colorado will give you a tax credit for the cost of converting a car into an electric vehicle—they will pay for the whole thing! It seemed too good to be true, and it was all the incentive I needed to look seriously at doing my own.

After some online research, I found that it was possible to build a practical electric car for myself. It turned out that the old time Boulder favorite, the classic VW Beetle, was the easiest car to convert—they are easy to work on, there are several companies selling ready-made kits to convert them, and you can find them anywhere at reasonable prices. It didn't take long for me to find one in decent shape on Craigslist, and once I plunged in I found the whole process easier than I expected. Any reasonably handy person could do it, and there were no special tools needed. It took about three weeks, but I could do it in less than a week now that I know how. The hardest part was deciding where to put the 10 batteries and how to hold them in place. The things I thought would be difficult turned out to be easy—the electronics and the mechanicals were pretty straightforward.

My Beetle has been christened “PlugBug,” and it's worked out far better than I would have expected. Originally I had thought it would be more of a novelty that I would drive for fun, but it has turned out to be my main form of transportation. I sold my Prius because I wasn't using it anymore! My job involves driving lots of short trips around Boulder, and with a range of around 30 miles; PlugBug is perfect for me. Keeping up with traffic is no problem, and the top speed of around 60 easily handles any type of Boulder driving.

There are some drawbacks, of course. Because there is no gas engine anymore, there is no heat or defroster, which makes driving on very cold days a problem. You also lose a little spontaneity—you can't just pull into a gas station for more fuel, so planning your day efficiently helps. But really the biggest issue for me is that it's an old Beetle—a bit cramped, no air conditioning, no power windows, etc.

Here's why I love it: I haven't been to a gas station in weeks! I didn't realize how much of a luxury plugging in the car at home would be. And it's cheap! A full charge, which takes about 8 hours, costs around 50 cents in electricity. At \$2.50 a gallon, that's the same cost as driving a car that gets 150 miles per gallon. But since I have PV panels on my roof, I drive for free! There are also no oil changes, no tune-ups, no scheduled maintenance—every cost connected to the gas engine from spark plugs to mufflers is gone. One benefit I didn't expect was how “clean” the whole experience of driving seems now. Until it's gone you don't realize how smelly and noisy a regular car is.

Given the range limit and lack of creature comforts, I know a car like mine isn't for everyone, but I couldn't be happier. What gives me the most satisfaction is that between the car and my PV panels, I've cut my overall energy usage by over 90%, and that helps our national security and our environment. •

*Chris Doran is can be contacted for advice on electric conversions at: [heychrisdoran@msn.com](mailto:heychrisdoran@msn.com)*



Chris Doran's “PlugBug”



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