

# The Driving Force in Production EVs

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Solectria Corp., Wilmington, MA, has a big pile of mufflers out in back of its corporate office / research center / manufacturing facility. Compact sedans and small pickups are lined up along the side with extension cords plugged in where the gas caps should be. Out front, signs read, "EV Parking Only." All others will be -- what, zapped?

Solectria founder and CEO James Worden says he has never owned a gas-powered car in his life. Worden, MIT Class of '89, built himself an electric car in high school, won the state science fair with it, and is also his company's director of research and development. Solectria might be considered a big garage hobby shop -- a copper coil, battery, and light bulb experiment to the nth power -- except that it sells cars, over 160 of them to date. In fact, Solectria manages to sell just enough cars, attract just enough investment capital, and get just enough government grants to keep the mufflers piling up out back.

Solectria's primary EV is the Force, a conversion from a gas-powered car. OK, it's a Geo Metro. I own a VW Fox, which seems like a King Tiger by comparison. But there are lots of Metros out there. Karl Thidemann, Solectria's marketing manager, informs me that Metros are manufactured all over the world under many different guises -- and each one could be reckoned an aspiring Force. Thus, Solectria's design could be applied to any number of overseas markets.

The Metro, as its name implies, is a useful enough four-seater about town. The Force inherits this quality. I get behind the wheel with Thidemann riding shotgun and consider that two (small) friends could have come along, too. By now, I'm an EV veteran, so I don't get all excited by the fact the Force doesn't make any noise when I turn the key.

The Force has a box with a knob on it where the stick shift had been, reminiscent of a model train control unit. There are three power level settings going forward, plus neutral and reverse settings. I turn the knob to high, step on the accelerator, and whine out of Solectria's lot into an industrial park.

While driving, the car makes a buzzy sound I don't like very much at first but quickly come to ignore. The accelerator is very soft, too. Basically, I alternate between flooring it and coasting to maintain speed. The regenerative braking system, however, is a very comfortable way to slow down. It pays, too. I enjoy watching the LCD display show me how much charge I'm putting back into the lead-acid batteries as I roll up to stop signs.

Out on busy Route 128, I can go as fast as I would want to for local distances. The Force has a rated top speed of 75 mph, and I approach that. The usage meter chides me, though. It reels off ever-increasing numbers like one of those real-time national debt displays. The \$35,000 Force would carry me an average

of 50 miles between charges. I could opt for NiMH batteries and double that range -- provided that I want to spend \$75,000. It takes a special person to plunk down that much for an electro-Metro.

Still, Solectria's vehicles can be recharged overnight from 110V outlets. The reduced maintenance and fueling costs for electric vehicles might compensate for the large initial outlay: Solectria hasn't done any long-term ownership studies. A number of utilities and nearby Hanscom Air Force Base have fleets of Solectria EVs, albeit of the lead-acid variety.

Many fleet buyers opt for the E-10 pickup truck, a conversion from a Chevy S-10. The E-10 features light pickup loading characteristics and significantly more power than the Force. I immediately recognize this when I drive the E-10. It rides higher, the acceleration is brisker, and it is a lot quieter than the Force. Since there is more room for batteries under the flatbed, the EV pickup claims a range of 60 miles at 45 mph. It costs \$50,000.

Solectria's technological tour de force is the Sunrise, winner of the 1996 Tour de Sol endurance race sponsored by the Northeast Sustainable Energy Association, Greenfield, MA. The EV, an advanced prototype of a vehicle scheduled to go into production in less than two years, managed a run of 375 miles before its NiMH batteries had to be recharged. The record for a production vehicle, by the way, is 249 miles. This was established during the 1997 Tour de Sol by a NiMH-equipped Force.

At first glance, the Sunrise is an aerodynamic cousin to GM's EV1. However, the composite body does not use a lick of metal structurally, making it a lighter. The workshop where Sunrise prototypes are assembled resembles a boat shop. In fact, the fiberglass-like body panels are outsourced to a sailboat maker.

The Sunrise seats four comfortably, with ample surplus legroom for the driver and front passenger. The car has a vast expanse of dashboard for keeping great quantities of the sundry items that tend to accumulate in cars. In fact, there is almost too much room up there (imagine that).

I go to roll up the window (standard operating procedure for aerodynamics-conscious EV drivers), but find no button or crank. Windows, when carried, are held in place by Velcro. This will not be so in the production model, I am assured. I am offered a window, but I decline.

The power control box is replaced by a circular knob on the vertical dash, rather like the cycle knob on some washing machines. I set the Sunrise to high and hit the road. This accelerator is squishy, too, and seems to be a Solectria trade-mark. However, Sunrise is very well behaved acoustically.

Out on Route 128, Sunrise's aerodynamics provide a smooth ride at all speeds. The car sports a bright yellow futuristic look and has all sorts of racing-style corporate sponsorship stickers on it. I check out other drivers on the highway, expecting to receive admiring gazes. I don't get so much as a glance. The locals must be used to seeing EVs in their midst. So might we all be, one day.