Comments heard from Dr. Walter J. Eager, owner of an Nissan Leaf car since 2011. He has made about 14,000 miles in this vehicle and is quite enthusiastic about it.

LeafEvan The all-electric, 2011 Leaf is an ideal vehicle for commuters and as the second car for two-car families. It is EPA-rated for highway travel at 92 miles per gallon (gasoline equivalent). Compare this with the Toyota Prius at 48 mpg and the Camry at 32 mpg. For example, those who commute 65 miles round trip each workday in a 2011 Camry, spend about $1,900 annually on gasoline. The Leaf's “fuel” cost for this same commute is about $400 when it is charged at home on Consumers' Power at 8 cents per kilowatt-hour. Therefore, the Leaf provides a $1,500 savings over the Camry each year. On Pacific Power's Blue Sky Program it would provide a $1300 annual savings. These savings will increase as gasoline prices rise. The drive-train maintenance cost is also much lower, because electric motors have far fewer moving parts than engines (e.g. there are no oil changes). Motors are quieter, so passenger compartments are quieter.

Leafs have a 5-star, NHTSA safety rating. The 2011 Leaf is EPA-rated for a 73-mile range. Because 95% of daily travel in the U.S. is 40 miles or less, the Leaf is an ideal second car for almost all families. It seats five, comfortably. The Leaf SL has an excellent backup monitor, navigation system, Bluetooth facility, telematics and many other conveniences. There is an even more economical means for the at-home charging of EVs. If the owners' home has solar access, they can have a 3.2 kilowatt solar electric system installed on its roof for an out-of-pocket cost of about $1000 under the Seeds for the Sol program. See https://sites.google.com/site/sftsv04/ for details. In about three years the savings on their power bill will pay back that that $1000. After that the homeowners will have cost-free electricity for charging their EV. This would reduce their annual “fuel” cost for commuting or family travel to zero for driving that averages 30 miles per day or less. As the price of gasoline increases, a family's profit from their EV investment will grow.

Until sufficient public charging stations are installed along all public highways , I will not recommend that single-car families or individuals replace their cars with EVs. I do recommend that they replace them with Plug-in Hybrids, such as the Volt, so as to assure that all necessary destinations can be reached. However, the range of Plug-in Hybrids on electricity will be only a half or less of that which an EV provides. That is because Plug-Hybrids are burdened by the additional

weight of its engine and related equipment during the electricity-powered part of its travel and with the additional weight of its motor, battery and related equipment during the gasoline-powered part.

The two-car family can avoid this costly compromise by owning a "composite hybrid" which is the combination of one EV and one fossil-fueled vehicle (FFV*).* The EV would be used for substantially more than 95% of daily travel (on average) that is within the EVs range on a single, at-home charge. The FFV would be used at least for the part of a family's travel for which the EV does not have sufficient range and is along routes that do not yet have sufficient commercial charging stations to to reliably extend its range. This is substantially less than 5% of a family's travel (on average). Those who commute more than 65 miles per day can do so with an EV, if they travel along a major highway (e.g. I-5 & 99W) which has Level 3 (quick) charge stations or work near a Level 2 charge station. The Level 3 charge station can provide any needed recharge up to 80% within 30 minutes. Level 2 charge stations can provide any needed recharge up to 100% within 7 hours. The latter would be used by commuters while they are at work. The economics of commercial charging are not as favorable as for charging at home.

Although electricity from commercial chargers is supplied by fossil fueled plants, the efficiency of those plants is about twice that of FFVs. Unlike FFVs their exhaust gases are localized, which enables removal of some of their toxic components. EPA is now requiring progressive reductions of toxic and greenhouse gas emissions from these plants. The emissions that remain are more effectively disbursed by their tall exhaust stacks, many of which are located in areas of low population and where wind causes more effective dispersal. FFV exhaust is predominately released in highly populated areas, the atmospheres of which are temperature-inverted and constrained by surrounding mountains. These conditions minimizes dispersal and maximizes concentration toxic gases.

Some of the adverse health effects of FFV exhaust are documented in :

http://www.ncbi.nlm.nih.gov/pubmed/14650202
Wei Sheng Yan Jiu. 2003 Sep;32(5):504-7.

When the Citizens Climate Lobby proposal for carbon fee and dividend is finally enacted into law and sustained, economics will force the owners of these fossil-fueled plants to replace them with clean energy plants. We will all be able to breathe healthier air and enjoy lives that are much more secure from the effects of climate catastrophes and the oil wars. In the meantime a priceless premium will accrue to all of us, each time one of us decides to replace one of our FFVs with an EV (two-car owners) or Plug-in Hybrid (single-car owners).

Some will be motivated by the personal economic or comfort advantages of EVs and solar power. Others will be motivated by concern over the human suffering that has been and will increasingly be caused by fossil fuel acquisition, extraction and combustion. Regardless of motivation, propelling ourselves and our stuff with clean, electric power (EVs & mass transit) and with food power (boots and bikes) is the only rational way to come and go.