ENERGY

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BEHIND THE WHEEL | CHEVROLET SPARK E.V., FIAT 500 E AND SMART FORTWO ELECTRIC DRIVE

Electric Service From $199 a Month

INTRODUCTION: A KilowattHour is a unit of energy. [1000 J/s][3600 s] = 3.6 X 10^6 J . cleantechnica.com site says the **Spark lithium Ion battery full charge is 21 Kwhr.** Smartusa.com says **full charge on Smart car is 17.6 Kwhr. QUESTIONS: (a) For the Spark knowing 3.6 miles traveled/Kwhr and knowing 82 miles traveled on full charge, find(verify) amount of energy needed to travel 82 miles? (b)Is ans. (a) close to stated full charge of Spark battery in introduction? (c) For the Smart Car knowing 2.6 miles/Kwhr and knowing 46 miles traveled on full charge, find(verify) amount of energy needed to travel 46 mile range? (d) Is ans. (c) close to stated full charge energy for Smart Car in introduction? ANSWERS: (a) ~78 X10^6 J (Spark) (b) (21 Kwhr)(3.6 X 10^6 J/Kwhr) = 75.6 X 10^6 J (Spark) (c) ~ 64 X 10^6 J (Smart) (d) (17.6 Kwhr)(3.6 X 10^6 J/Kwhr) = 63.4 X 10^6 J (Smart)**

Electric cars are getting cheaper. Although purchase prices vary, the Chevrolet Spark E.V. and Smart Electric Drive Cabriolet can be leased for three years at $199 a month, and the Fiat 500e at $239. That means consumers are likely to weigh factors other than the bottom line when deciding which — if any — of these small, stylish battery vehicles to put in their driveway. The good news is that none of them are terrible. But would a pure electric vehicle meet your needs? If your family has only one car and takes long trips, a plug-in hybrid like the Chevrolet Volt would probably be a better choice. But if you simply want a fun car for frugal, eco-friendly commutes, one of these may be worth considering. Federal and state incentives can sweeten the deal.

(((Fiat 500e))) California Dreaming Over nearly 100 miles of combined city-highway driving, I got the electric-car equivalent of 121.3 m.p.g. (quite close to the E.P.A. rating of 116 m.p.g.e). That translates into **3.6 miles per kilowatt-hour or a respectable 79.9 miles per charge based on the available energy from the battery pack.** The 500e has well-designed graphic displays to keep track of consumption and the state of charge, and also, like the other cars, a smartphone app.
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(((Chevrolet Spark))) The E.P.A. rates the Spark E.V. at a combined 119 m.p.g.e. I **averaged 3.8 miles per kilowatt-hour, and based on the available energy in the lithium-ion battery pack, that translated to about 82 miles of range** .

(((Smart Cabriolet))) Unless I'm missing something, Smart offers the **only battery-powered convertible in the country,** which may explain its growing popularity in Southern California. The E.P.A. rates the Smart E.D. at 107 m.p.g.e. in combined city-highway driving and its range at 68 miles. I didn't do that well in mostly around-town driving; **2.6 miles per kilowatt-hour over 102 miles translates to just 46 miles of travel on a charge.**