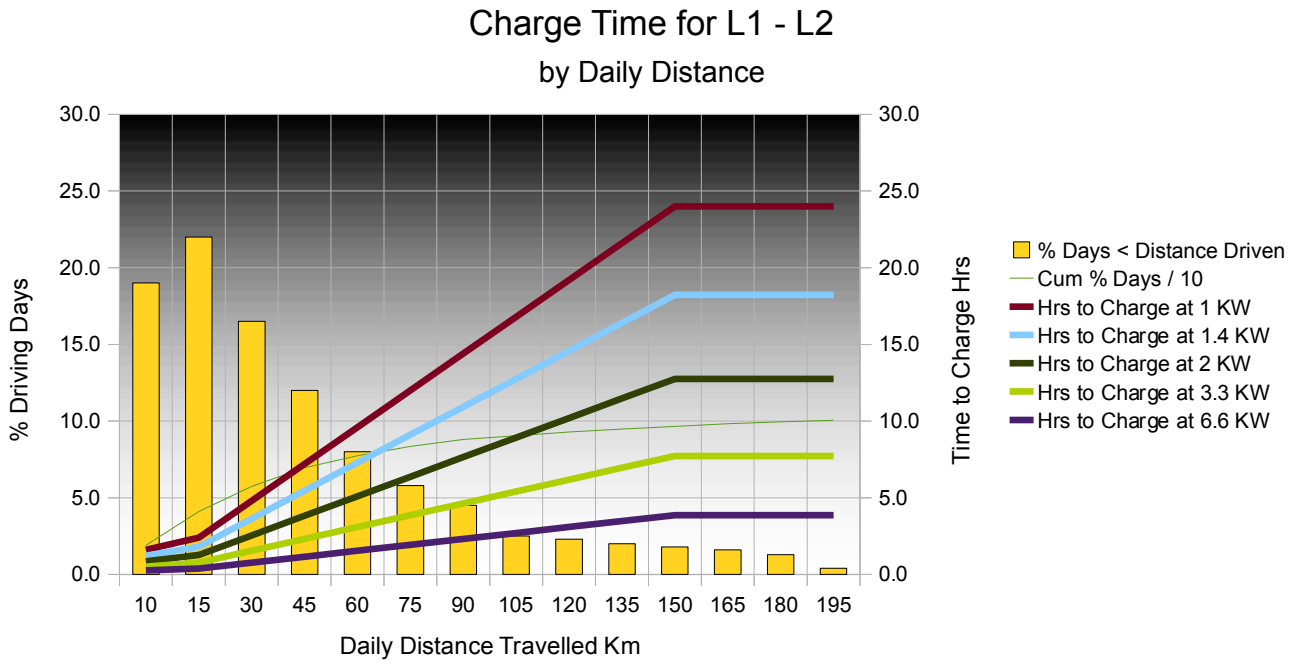
How long does it take to charge an electric vehicle? - Overnight!

Well, actually it depends on a number of things, including the distance driven on any given day. We drive an average of 50 Km / day but some days are less, some are more as shown in the bar graph.
It also depends on the efficiency of the vehicle, which in turn depends primarily on weight. An average-sized vehicle such as a Leaf uses an average of 160 Watt Hrs / Km. A carbon fibre BMW i3 uses an average of 120 Watt hrs / km. A Tesla S, much heavier with it's big battery, uses an average of 265 Watt Hrs / Km. The graph here is for an average EV.
It depends on the charger capability in the car. Some cars can charge at a maximum of 3.3 kWatts, many at 6.6 kWatts, a Tesla even more. This graph assumes a 6.6 kWatt charger.
It depends on the EV Supply Equipment or Cordset capability. The cordset in your trunk may have a 1 kWatt charge rate, but some have a slightly faster 1.4 kWatt rate. An EV Supply Equipment in your garage may have a charge rate of 2, 3.3, or 6.6 kWatt, or more.
And finally, it depends on the electrical infrastructure wiring and branch circuit capacity. A common 15 Amp shared outlet may deliver up to 1.4 kWatt for all appliances, but 1 kWatt is safer if other appliances are connected. A level 1 120V/20A dedicated electrical outlet will support 2 kWatt minimum. A level 2 240V/20A circuit may support 3.3 kWatt minimum, or more: 8 kWatt for 240V 40A.

The graph below shows charge times for a range of driving distances with separate lines for various charge rates.

For example, an average driving distance of 50 Km can be recharged in about 4 hours at a 2 kWatt charge rate. An overnight charge for 10 hours will replenish 150 Km of driving on the same 2 kWatt Level 1 outlet with a 2 kWatt EV Supply Equipment. However the typical cordset from your trunk, meant for emergency use, will take about 6-9 hours to provide an average days range of 50 km.

Because 87% of our charging is done at home overnight while we sleep, almost all drivers can use a Level 1 120V/20A dedicated circuit wiring (with a matching EVSE) to do all their charging. On those few occasions when long trips are taken on consecutive days, a public Level 2 charge station, or DC Fast Charge station can be used for the additional charging required. In fact, over 80% of our driving can be replenished daily with the marginal 1kWatt cordset supplied with the EV. We don't expect to start out each day with a full gas tank; just so, after a long day of driving we can take a few days to fully recharge our EV, while doing the more usual modest distances. Public charge stations are a faster 8 kWatt and can be used while on the go for an extra top up from time to time.



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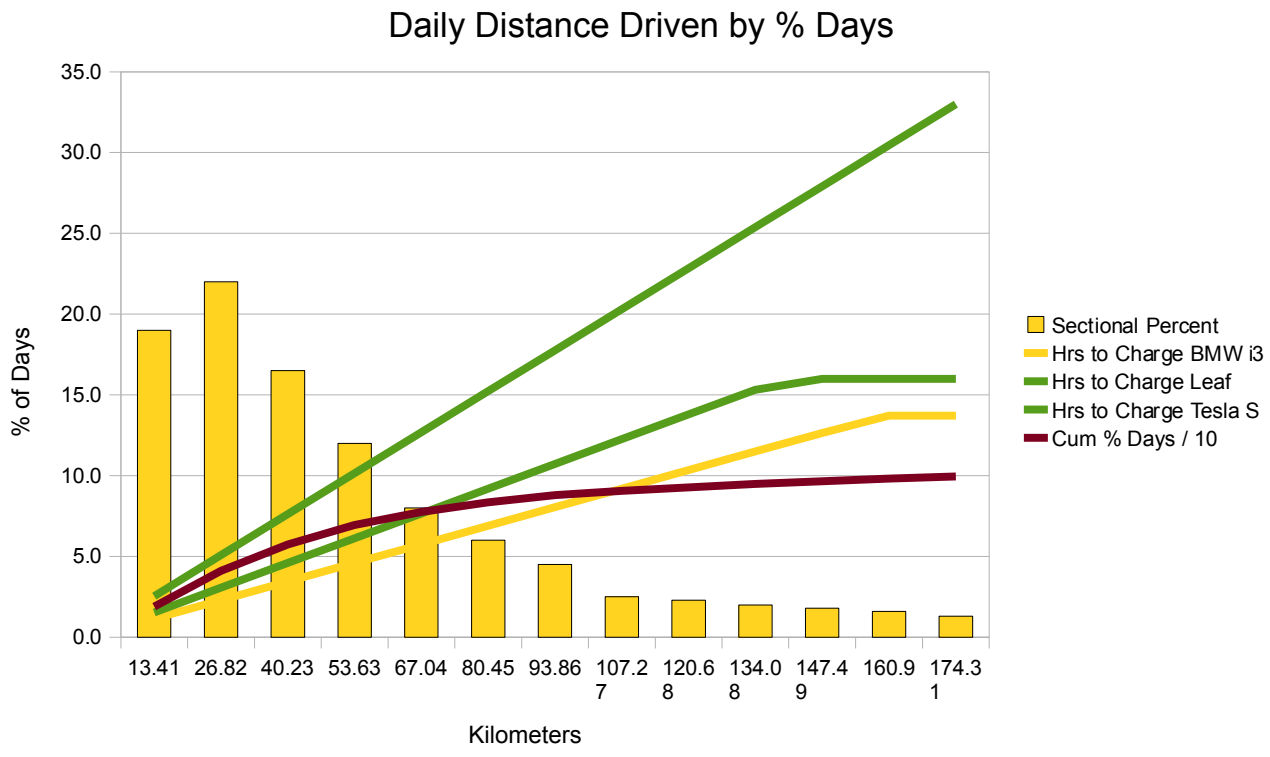
Do all EVs take the same time to charge? No!

For the same driving range, an efficient EV will take less time to charge than a heavier, less efficient vehicle.
The graph below shows the time it takes to charge an efficient, lightweight BMW i3, an average Nissan Leaf, and a heavy Tesla S for daily driving distances. All are capable of charging faster with the on-board charger, but times are limited in this case by the cordset and minimal capacity of a shared circuit. This graph is based on using a 1.4 kWatt cordset and a common shared outlet. A dedicated Level 1 120V / 20A outlet would charge all cars faster, as would a more expensive Level 2 240V /20A or 30A or 40A supply. Although faster, Level 2 EV Supply Equipment and 240V high amperage wiring is more costly (in some renovations the total cost is almost prohibitive). A Level 1 120V 20A outlet with a matching EVSE is the sweet spot for almost all drivers. Plug in Hybrid owners can get away with less; drivers doing longer distances regularly may need faster charging.
Although less efficient vehicles take longer to charge, they often have larger battery packs which act as a storage buffer, enabling similar driving distances with a slower charger.



EVs are a paradigm shift from gas cars - Although we are used to taking our gas cars to a service station to refuel every few days, but we don't need to go to the gas station every day. In the same way, we don't have to charge our EVs at public charge stations every week. We can charge them daily and conveniently at home when we are not using them, much like our cell phones and laptops. It is a new paradigm. It only takes a few seconds to plug in an EV:it took much longer to fill our old gas cars. Drive all day, charge all night is the new paradigm Looking for faster charging at home only perpetuates the old paradigm.
dc 2013-11-11