BATTERY RECYLCING

While the environmental benefits of electric and plug in hybrid vehicles are clear, they do come with certain challenges. By far the biggest challenge is figuring out what is to be done with the electric plug-in and hybrid batteries after they are finished being used.

All car batteries can and should be recycled.

Figure 1: http://eagleenvironmental.us/uncategorized/battery-recycling/

The most important component of vehicle batteries is lithium. Lithium is already in high demand as it used in rechargeable batteries for laptops, mobile phones, and digital cameras. In 2015 the estimated demand for Lithium is 138,500-265,000 tons and in 2020 the demand may reach 175,000 to 500,000 tons, with most of the demand going towards batteries.

Figure 2: Lithium fields.
https://www.roughguides.com/gallery/20-destinations-to-see-before-they-disappear/

While recycling batteries to extract lithium makes perfect sense, financially it is not worth it since the cost to recycle the lithium exceeds the cost of mining new lithium.

Most of the value in recycling car batteries comes from the amount of nickel, cobalt, iron and other metals for reuse.

While most of the batteries are made with Lithium, not all electric plug-in and hybrid batteries use it as a main source.

Most consumers that drive a hybrid or electric vehicle care greatly about the environment so it's important to ensure that the battery is disposed of properly. For consumers that see their vehicle until the end of its life, what options are there for the battery? The battery should not be sent to a random scrapyard to be recycled, as the parts need to be processed properly. Throwing away these batteries is not an option as they can be hazardous and cause pollution.

Figure 3: battery coroding.
http://sustainingourworld.com/2014/09/25/can-you-put-dead-batteries-in-the-trash/

Once they've been used, the batteries normaly retain about 70-80% of their original capacity so while this is not enough to use in a vehicle they can still find other uses.

Until proper infrastructure is in place there have been alternative ideas as to what to do with the batteries. One possibility is using electric and hybrid batteries to store electricity. A homeowner can bundle electric-car batteries to solar panels to store electricity for their house. A solar or wind farm that generates energy throughout the day can store electricity in the batteries for later consumption.

The car manufacturers are also looking into aftermarket uses of electric batteries as well. Nissan isworking with Green Charge Networks to sell a mass-market energy storage system

built on Nissan Leaf batteries. General Motors is also pursuing a similar plan where they will use Chevy Volt batteries to help power the General Motors Enterprise Data Center.

As hybrid vehicles become more prevalent it's going to become more important to find safe and environmentally friendly ways of disposing of the car batteries. Given that the average life of an electric car battery is about ten years, we're about ten years away from needing solutions to dispose of one million car batteries with millions more to come.

The automotive industry faced the same situation twenty years ago, for recycling lead-acid 12-volt starter batteries used in gasoline-powered vehicles

DID YOU KNOW?

Daimler AG announced that it is cobbling together used lithium-ion batteries from electric and plug-in hybrid vehicles to create massive power storage systems for commercial use.

The first of Daimler's "2nd use battery storage units" will consist of 1,000 smart electric drive vehicle batteries and have a 13 million watt hour (MWh) capacity. It is expected to be connected to the electrical grid in Lünen, Germany early next year.

EV carmaker Tesla announced in 2015 a home and commercial battery storage system. The home system, called the Powerwall, is a 7 kilowatt-hour (kWh) system that will retail for $3,000 and a 10kWh unit that costs $3,500.

Figure 3: Tesla Powerwall
https://cleantechnica.com/2016/01/08/tesla-starts-off-2016-producing-delivering-powerwall/