

# BATTERY STORAGE

Lithium-ion batteries are a common technology used in cell phones, power tools, laptops, and many of the technology devices we know and love. Today, the same kind of batteries are scaling up to power electric vehicles and provide energy storage for renewable energy sources and the utility grid.

Bloomberg New Energy Finance analysis found the cost of battery storage dropped 76% since 2012. Costs are expected to continue to decline, and that means we expect demand for these batteries to increase.



## BENEFITS OF BATTERY STORAGE



### FOR ELECTRIC VEHICLES

Enable electric vehicles to use 60% of the energy provided for forward motion, compared to standard vehicles today that only convert 20% of gasoline energy into motion

Allow near-silent operation with zero local air pollution in your garage and community



### FOR RENEWABLE ENERGY AND THE POWER GRID

Store and better integrate solar and wind energy

Maintain and increase electric grid reliability

Reduce the need for new electricity generation

Serve as non-polluting backup power sources



# WE GET A LOT OF QUESTIONS ABOUT BATTERY STORAGE!

## WHERE DO THE MATERIALS IN BATTERIES COME FROM?

Batteries can be made from a variety of materials sourced from around the world. According to the Argonne National Lab, the mineral deposits needed for batteries will not be depleted anytime soon.

**LITHIUM** • South America and Australia provide much of the world's lithium, though mines are opening across North America. Lithium is most often mined by extracting brine from underneath lakes and evaporating the water.

**COBALT** • One of the most expensive materials in a battery, it's often mined in countries that unfortunately do not follow strict labor laws. Because of this, the industry is rapidly moving toward cobalt-free batteries.

**NICKEL** • Most of the material in a lithium-ion battery is actually nickel, which is mined in Australia, Canada, Asia Pacific, and Russia. Tesla says that 100% of the nickel in their batteries is recyclable.

**GRAPHITE** • Natural and manufactured graphite are used to make the anodes in lithium-ion batteries. China produces much of the world's graphite.

## HOW LONG DO BATTERIES LAST?

A long time! Electric vehicle batteries are warranted for at least 8 years or 100,000 miles. Storage batteries typically come with a 2-year warranty that can be extended to up to 10 years. Like your phone battery, these batteries will lose some capacity over time, which can be mitigated by taking good care of them.

## WHAT HAPPENS AT THE END OF A BATTERY'S USEFUL LIFE?

The batteries from the first electric cars are not quite hitting the end of their life. When they do, they won't be headed to the landfill.

**THEY CAN BE REUSED** • Pilot programs are happening across the country to re-use electric vehicle batteries. An electric car battery still has 70% power capacity when it's retired from a vehicle. That battery can be used for residential storage or as backup power for commercial buildings, for example.

**THEY CAN BE RECYCLED** • Batteries still have valuable materials in them, even at the end of their life. There are dozens of companies around the world that are working to build out the supply chain to recycle batteries.

