

CREATION CARE GREEN TIPS  January 2023

**The New Climate Bill: Hope for Transitioning to Electric Vehicles and Greener Electric Car Batteries**

1.  U.S. electric vehicle (EV) sales hit a record high between April and July, according to *Consumer Reports,* although we currently lag far behind Europe and China in our transition to EVs.  The new Climate Bill (Inflation Reduction Act) is about to change that with making available **$36 billion to incentivize EV purchases over the next decade.**  This is good news for the climate and for public health, as the transportation sector is the **largest US source of global warming pollution** and accounts for more than half of the country's toxic air pollution.  A new Union of Concerned Scientists ([ucsusa.org](http://ucsusa.org)) analysis shows that because EVs have no tailpipe emissions, their life-cycle global warming emissions are **dramatically lower than that of gas- and diesel-powered vehicles.**

2.  While EVs show promise in drastically lowering warming emissions, their reliance on battery materials (such as cobalt, lithium, manganese, and nickel) comes with considerable public health, environmental, and human rights challenges.  Scientists are in the process of **altering batteries' chemistry** to reduce this reliance, and the federal government has taken notice by calling for **half of all new vehicles sold in the U.S. to be electric by 2030, with cobalt and nickel to be engineered out of batteries.**Automakers are introducing plans to use cobalt-free batteries by 2028 (Nissan), or **lithium-ion-phosphate batteries**, which do not contain cobalt or nickel (Tesla), but the current processes for obtaining lithium are also problematic, given that worldwide it is produced by either **hard-rock mining or salt-flat brine extraction.**Both processes produce toxic wastes (sulfuric acid, uranium, lime, magnesium), which threaten nearby wildlife and communities, and brine extraction also requires fresh water in arid locations that rob local communities of their already stressed water supplies.  While the U.S. is not currently a leader in lithium production, the California Energy Commission estimates that some of the world's largest lithium reserves are in California's Salton Sea, calling it "one of the most promising and environmentally friendly lithium prospects" in the country.

3.  Scientists at the Union of Concerned Scientist's (UCS) Clean Transportation Program have found that the best source of lithium for lithium-ion batteries (and other battery materials) is what can be recovered through **reuse and recycling.**Even after the typical EV's life span of 10 to 15 years, batteries are still expected to have roughly **80% of their original capacity.**All these batteries can be recycled, and some even repurposed for stationary storage used for variable renewable energy, such as **solar or wind power, which is vital for transitioning from fossil fuels.**Considering the problems associated with mining, using recycled materials (lithium, cobalt, manganese and nickel) is a preferable option, and would **cut battery-related global warming emissions** by 30 percent, according to a recent study.  This is already being done, for example, at Redwood Materials, a hydrometallurgical recycling plant in Nevada, which reports a recovered **95% of the materials from consumer electronic and EV batteries.**Another 2021 study found that under optimal conditions, recovered materials could meet **more than half of worldwide lithium-ion battery material** by 2040, making EVs even greener.

4.  In addition to less-polluting technologies for extracting lithium for lithium-ion batteries, and recycling and reuse of current batteries, researchers are also working to **develop alternatives to the lithium-ion battery.**Chemical engineers at the University of Michigan have announced the design of a **lithium-sulfur battery** that could **quintuple EV ranges on a single battery charge.** The National Science Foundation recently awarded a grant to research **sodium-ion batteries,** because sodium is considerably cheaper and more widely available than lithium.  Partnering with BMW and Ford, Solid Power, a Colorado company, recently started a pilot project to produce **solid-state batteries,** which promise to significantly extend EV ranges.  The ability to store more energy using less material than lithium-ion batteries makes the solid-state battery the most significant development of all:  it means **less mining and the prospect of creating a higher ratio of recycled materials.**