Latest battery storage technology

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Lithium and other key metals are shaping the future of battery technology.

This article is from The Spark, MIT Technology Review"s weekly climate newsletter. To receive it in your inbox every Wednesday, sign up here.

I was chatting with a group recently about which technology is the most crucial one to address climate change. With the caveat that we"ll definitely need a whole host of solutions to truly tackle the challenge, my personal choice would have to be batteries.

Expect new battery chemistries for electric vehicles and a manufacturing boost thanks to government funding this year.

This might not be a surprise, since I"m almost constantly going on about batteries--If you want to read more on the topic, we"ve got loads to choose from on the site. You can start here, here or here.

Batteries are going to transform transportation and could also be key in storing renewables like wind or solar power for times when those resources aren"t available. So in a way, they"re a central technology for the two sectors responsible for the biggest share of emissions: energy and transportation.

And if you want to understand what"s coming in batteries, you need to look at what"s happening right now in battery materials. The International Energy Agency just released a new report on the state of critical minerals in energy, which has some interesting battery-related tidbits. So for the newsletter this week, let"s dive into some data about battery materials.

This probably isn"t news to you, but EV sales are growing quickly--they made up 14% of global new vehicle sales in 2022 and will reach 18% in 2023, according to the IEA. This global growth is one of the reasons we here at MIT Technology Review put "the inevitable EV" on our list of breakthrough technologies this year.

Add to the steady market growth the fact that around the world, EV batteries are getting bigger. That"s right--not just in the US, which is infamous for its massive vehicles. The US still takes the cake for the largest average battery capacity, but the inflation of battery size is a worldwide phenomenon, with both Asia and Europe seeing a similar or even more dramatic jump in recent years.

Add up the growing demand for EVs, a rising battery capacity around the world, and toss in the role that batteries could play for storage on the grid, and it becomes clear that we"re about to see a huge increase in demand for the materials we need to make batteries.

Take lithium, one of the key materials used in lithium-ion batteries today. If we"re going to build enough EVs to reach net-zero emissions, lithium demand is going to increase roughly tenfold between now and 2040. Lithium is one of the most dramatic examples, but other metals, like copper and nickel, are also going to be in high demand in the coming decades (you can play around with the IEA"s data explorer for yourself here).

We"re not going to run out of any of the materials we need to generate renewable energy, as I wrote earlier this year. Batteries could be a tighter scenario, but overall, experts say that we do have enough resources on the planet to make the batteries we need. And as battery recycling ramps up, we should eventually get to a place where there"s a stable supply of materials from old batteries.