

2. What do we have to mine?

The second part of the presentation is about which metals and minerals we need to mine to fuel the green technology revolution.

- Play the briefcase game produced by the European Institute of Innovation and Technology (EIT), which has been designed for a number of different age groups and has teaching aids provided. (<http://briefcase.eitrawmaterials.eu/>).
- Pick a green technology – EV, lithium-ion battery, solar panel etc. – and research which are the main metals required to produce them.

Raw Materials That Fuel THE GREEN REVOLUTION

Even though green energy comes from renewable sources like the sun and the wind – it still requires massive amounts of finite resources to make it all work.

To get off fossil fuels, we will need massive amounts of these other metals and minerals.

Because of heavy battery weight, EVs tend to use much more aluminum in their bodies than gas-powered vehicles.

Motors with permanent magnets are more common for EVs, and use rare earth metals like neodymium to create powerful torque. Even the Tesla Model 3 will use a PM motor.

Wind turbines also use permanent magnets to generate electricity.

Constructing solar panels and wind farms on a significant scale takes large amounts of metal.

Photovoltaic use already accounts for 8% of silver demand.

THE GREEN REVOLUTION

Distribution & Fuel

Energy Storage

Electric Motors

Hardware



While not technically renewable, nuclear energy is considered sustainable by most. In fact, it's the safest type of energy (by far) in terms of deaths per TWh generated.

Copper is the metal of choice for much of the world's wiring and circuitry. Silver and aluminum are great conductors, too.

Gold does not tarnish or corrode, so it's used for electrical contacts in "mission critical" or precision equipment.

The green revolution is not possible without the ability to economically store energy.

Flywheels, pumped hydro, and compressed air are some other ways to store energy on a larger scale.

12V 40AH DEEP CYCLE LITHIUM ION BATTERY

Lithium-ion batteries need materials like lithium, cobalt, nickel, and graphite, but these battery metals all have important and unique supply chain limitations.

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