

Busting a myth about how much mining is needed for fossil fuels versus renewables

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Worldwide, 15 billion tonnes of fossil fuels in the form of coal, oil, and gas are mined and then burned. And the emissions from such burning deposits into our lungs, onto the ground, and into the water. Such emissions cause about 5 million air pollution deaths every year worldwide. Meanwhile, only 1.5 million tonnes per year of precious metals, such as rare-earth elements, lithium, and cobalt, are needed today. That's one ten-thousandth the mass of fossil fuels mined yearly.

Now, let's say we want to transition all 1.5 billion vehicles in the world to battery-electric vehicles. That would require about 16 million tonnes of lithium, which is about one-one-thousandth the mass of fossil fuel material mined every year worldwide. But each battery-electric vehicle will last 20 to 25 years, so you don't need to mine new lithium every year for that vehicle. And the lithium won't be burned for fuel, so people won't suffer air pollution damage from it. Further, after 20 to 25 years, the lithium will be recycled, because right now, over 97% of lithium from a battery can be recycled. So, over one-hundred years of battery-electric vehicles, the total mass of lithium needed for 1.5 billion vehicles is still near 16 million tonnes, which is one one-hundred-thousandth the mass of fossil fuels that will be mined during that same 100 years.

In addition, 50,000 new oil and gas wells are drilled every year today in central North America alone. The U.S. has 1 million active oil and gas wells and 4 million abandoned ones. The world has 29 million abandoned oil and gas wells. So, worldwide, if we continue using fossil fuels, we will need hundreds of thousands of new oil and gas wells, in addition to coal mines, each year worldwide for fuel and building infrastructure. With renewables, we will need zero new mines for fuel; only for building infrastructure. Such mines needed for an all-electric clean, renewable energy world across all energy sectors number in the tens to hundreds, not hundreds of thousands, per year. So, we will need orders of magnitude fewer mines in a clean, renewable energy world.

[Note for non-scientists: an order of magnitude is a factor of 10; two orders of magnitude is a factor of 100; etc.]