Decarbonizing the world's economy will require an enormous amount of minerals like copper, lithium, nickel and cobalt. Everything from electric vehicles to solar panels to transmission lines will require these raw materials.

In some cases, mining these minerals has disastrous consequences for workers, indigenous communities, and the environment. This has led some clean energy skeptics to argue that decarbonization will be bad for both humans and the environment.

But transitioning to **clean energy** will mean we no longer have to mine and extract vast quantities of fossil fuels each year. A clean energy transition will help us avoid the worst effects of climate change; it will save millions of lives currently lost to air pollution each year; and, importantly, it will reduce the total amount of environmentally and socially harmful mining each year.

In 2020, 7 million tons of minerals were mined globally for low-carbon energy, according to the International Energy Agency (IEA). (These are often referred to as "transition minerals.") In order to limit warming to 2 degrees celsius, we'll need to scale up that production to about 28 million tons per year.

That's a lot of transition minerals. But how does it compare to the mining and extraction of today's fossil fuel economy?

Every year, about 15 billion tons of fossil fuels are mined and extracted. That's about 535 times more mining than a clean energy economy would require in 2040.

Part of the reason for this massive difference in mining requirements is the fact that fossil fuel infrastructure is much less energy efficient than clean energy technology. Gas-powered cars are three times less efficient than electric vehicles. Gas furnaces are three to four times less efficient than heat pumps. Coal, oil, and gas all need to be transported long distances from mine or well to the source of combustion.

A clean energy economy just requires much less energy than a fossil fuel economy.

But there's another important reason for this difference. Fossil fuel infrastructure requires constant fuel input. Building a coal or gas power plant, like building a wind or solar project, requires a lot of materials and energy input upfront. But for a fossil fuel power plant, construction is just the beginning. In order to generate power, you need to burn coal or gas every day for decades. Wind and solar projects, by comparison, don't require any ongoing fuel input.

Still, both the environmental and human impacts of mining minerals for the energy transition can't be ignored. Policymakers should use every tool available to both minimize the total amount of clean energy minerals needed in the future and ensure those minerals are mined in socially and environmentally-friendly ways.

But make no mistake: transitioning away from fossil fuels is one of the most effective ways to protect both the environment and the most marginalized communities in the world.

Source: Distilled