

# Can Diamond Mining Companies Save Us from Global Warning?

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Sometimes, it seems investors forget we live on a finite planet. We can't have 11 billion people driving diesel cars and eating burgers, without invoking rapid catastrophe. Smart investors always bear this in mind – and invest accordingly.

Fossil energy is certainly limited. Not only is there a restricted amount of fuel to dig up, but there's also the issue of dealing with the CO<sub>2</sub> that's produced. That's one reason why, at *Exponential Investor*, we're keen to stress the huge investment opportunities from future-proof clean energy.

Today, we're looking at the earth – in a very literal sense. Before I get started on explaining how rocks and soil can magically “fix” carbon dioxide pollution, I'd like to tell you a little about a form of energy that comes directly from the earth itself. You can think of it as “volcano power”. I've previously been rather tepid on geothermal energy – but things are changing. Instead of low-grade heat, it's now potentially possible to exploit the super-high temperatures from much deeper, hotter rocks. Of course, the amount of heat energy stored deep in the earth is almost unimaginably vast – the planet consists almost entirely of red-hot rock, with a very thin skin of continents and oceans on top. An economically-viable way to exploit this high-temperature geothermal energy could be revolutionary. If you'd like to find out which stocks are poised to benefit from a leap forward in geothermal energy, you can get the latest information [here](#).

Now, we'll take a look at how geology can help us deal with yesterday's energy missteps...

Mining companies get a bad rap – despite our hunger for the commodities they produce. Miners make poor neighbours – with their mountaintop removal, toxic waste, and constant vehicle movements. It's not surprising that they're seen as a necessary evil in the global economy.

So, it may surprise you to learn that a major diamond miner (De Beers) has started deploying a technique which could be a “fix” for climate change. In fact, the firm might literally fix CO<sub>2</sub> into rocks – locking it up on a permanent basis.

Let's step back a bit and look at the context for this. Obviously, CO<sub>2</sub> is a natural component of the atmosphere. Since the dawn of complex life on Earth, it's played a vital role in keeping the planet warm. It may surprise you to know that a “magical” process governs CO<sub>2</sub> concentrations in the atmosphere. This clever trick of chemistry keeps the Earth at exactly the right temperature.

## Here's how the world stays at the right temperature

Carbon dioxide is steadily produced by volcanoes. If the Earth warms up, this CO<sub>2</sub> reacts more quickly with the rocks in the Earth's crust (by chemical weathering) – meaning it disappears more quickly from the atmosphere. The carbon remains bound up in rocks, until it's released again by the volcanoes, as CO<sub>2</sub>. The process acts like a huge global thermostat. Even though the sun's output has changed enormously over deep geological time, this process has kept the Earth's very long-term temperature relatively stable.

## But hang on... won't that sort out climate change?

Unfortunately, no! These reactions happen much too slowly – on a timescale of thousands of years. By that time, the ice caps would have melted long ago, [flooding the world's coastlines](#). (Property investors, particularly, should take note of the risks to low-lying communities.)

## Could we speed this reaction up?

Other than temperature, the main control on the rate of this reaction is the amount of suitable rock available to react with the carbon dioxide. If rocks are in big pieces, or buried in soil, they don't get in contact with CO<sub>2</sub>.

## Here's where the diamond miner's “magic trick” comes in

By good fortune, diamonds are often found under rocks which are rich in minerals that react aggressively with carbon dioxide – such as kimberlite. To retrieve diamonds, these rocks have to be smashed up and moved. So the diamond miners end up with a lot of CO<sub>2</sub>-reactive rock, which they ordinarily have no use for. Normally, this waste is piled up in massive heaps, where it will likely sit for thousands of years. But if it was treated differently, it could react with CO<sub>2</sub> in the air. For this to happen, the rock needs to be fairly thinly spread – ideally in a hot, wet environment.

Then, all this troublesome mine waste could become a global saviour. Instead of thinking about miners as bad neighbours,

suddenly everyone would want a piece of their rubbish – to mop up pesky CO2 emissions. What a great position for the miners to be in!

Fortunately, plenty of extraction processes give rise to mineral wastes with the right chemistry. However, it's not possible to use it effectively in every part of the world. In some places, it's too dry or cold. In others, there is insufficient land to spread the waste out. Finally, in many mines, the transport network is too rudimentary to move huge volumes of rock. (After all, diamond mines don't need high-capacity freight networks – unlike, for example, coal mines.)

Globally, there's an awful lot of suitable rock dug up each year – and, right now, it's a big problem. Using this waste effectively is a big PR coup – and a big economic opportunity. De Beers is the first company to take this process seriously. However, in academia there is already a big push to start working on this technique – to see if it works as well as theory predicts. Fortunately, the UK is a global leader in this “enhanced weathering” research – and our northern slag heaps could already be sucking up far more CO2 than most people realise.

There have been previous attempts to test this process. Nearly a decade ago there were plans to spread basic rocks on to a beach in Holland (“basic” as in reacts with acids, like indigestion remedies). On the shoreline, waves would continuously smash rock particles into ever-finer grains. Furthermore, animals such as worms and flatfish tend to ingest the sand, and their guts help the process along. So, as we covered in our [interview with D'Maris Coffman](#), chucking rocks into the sea could offer a very simple solution to climate change.

It's difficult to predict exactly how rocks will weather in real-world environments. Therefore, only open-air experiments will really tell us what we need to know. These experiments aren't particularly expensive, and there are a lot of suitable locations. Within perhaps five or ten years, we could have a very clear idea about how to get rid of the unwanted carbon dioxide in the atmosphere. The answers could provide a big, unexpected boon to those formerly-troublesome miners.

### **What's the alternative?**

If you are following the international agreement process on climate change, you'll see that the current “big idea” for getting rid of CO2 is to grow plants, and burn them in power stations – then to capture the CO2, and bury it. This idea is abject nonsense: it's hugely expensive, and competes for land with food crops. International political agreements currently depend on this barking-mad process to protect us from climate change. It can't happen, and it won't happen.

### **That's why this “diamond” idea to fix climate change is so promising.**

The global environmental pariah of the mining industry could turn out to be our knight in shining armour. If this CO2 + rock reaction works well in practice, it could save our bacon. This doesn't excuse continued use of fossil fuels – as the process would still take decades or centuries to clean up the CO2 (meanwhile, solar radiation management geoengineering can be [used as a stop-gap](#)).

If you have investments in commodities markets or the extractive industries, this is a technology you need to be aware of. It could make a huge difference to which mines get permitted – and to the costs they face in operation. Likewise, if you're playing on the carbon markets, you'll need to watch out for this quick and cheap way to lock up huge volumes of CO2.

Finally: don't forget to check out our

Feedback, as always, to: [andrew@southbankresearch.com](mailto:andrew@southbankresearch.com). Today, we'd particularly like to hear what investment decisions you've made as a result of *Exponential Investor*. We'd like to check that we're not just shouting into the abyss.

Best,

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*Exponential Investor*