



# What is climate restoration? And can we really do it?

## Why climate restoration?

Climate restoration means ending the climate crisis by restoring a climate that humans have actually survived over the long term. It's important to do this by 2050, while Earth's systems are still working well enough.

Most people agree that we have a moral obligation to restore a safe climate for future generations. Although climate restoration is still a new idea to many — we can do it if we want to.

## What's a safe climate?

It's one that has sustained humanity and nature over the long term.

For at least 800,000 years, CO<sub>2</sub> levels never rose above 300 parts per million (ppm). (In other words, of every million dry air molecules, only 300 were CO<sub>2</sub>.) We are literally designed for a world of 300 ppm CO<sub>2</sub> and below. That's safe.

The “pre-industrial” climate, which we enjoyed for the last 10,000 years had CO<sub>2</sub> levels about 280 ppm. A century ago, CO<sub>2</sub> climbed above 300 ppm. It's been rising ever since, further and further out of our historically safe range.

## Where are we now?

Atmospheric CO<sub>2</sub> is now 50% higher than pre-industrial levels. It's 420 ppm. The last time there was this much CO<sub>2</sub> in the air was about 14 million years ago — when hominids hadn't evolved yet!

Current levels are so high because there's an extra *trillion* tons of CO<sub>2</sub> already in the air, from the fossil fuel we burned over the last couple of centuries.

CO<sub>2</sub> is set to climb over 460 ppm by 2050 if we continue doing what we've been doing, and don't implement large-scale climate restoration solutions soon. Climate chaos will get worse than it is today.

## Why do we say that climate restoration is possible?

Because it's happened many times before. Nature removes about a trillion tons of CO<sub>2</sub> regularly — about every 100,000 years — leading up to ice ages. Nature also pulls down billions of tons — “gigatons” — of CO<sub>2</sub> very quickly, after volcanic eruptions.

## Won't "net-zero" keep us safe?

Getting to "net zero emissions" by 2050 is now the goal of most climate action.

Currently, we're adding about 36 billion tons of CO2 each year. Net zero means *not* adding any more CO2. Net zero is vital for human and ecosystem health.

The idea also causes a lot of confusion. Many people think that net zero will also restore a safe climate. That's not the case.

Why not? Because there's already a trillion tons of CO2 in the atmosphere! *That's what's* causing nearly all the climate chaos. And it'll stay there up to 1,000 years unless we intervene to pull it out.

Our yearly emissions — now 36 billion tons of CO2 — is only 3.6% of what's already in the air. If we stopped *adding* CO2 today, we'll still have climate chaos.

An analogy: Let's say your basement is flooded. Net zero means plugging the leak so no more water seeps in. Climate restoration means pumping out the huge amount that's already there. We can and must do both.

## What about direct air capture (DAC) and other carbotech CO2 removal?

They're simply too expensive to scale and thus cannot reduce CO2 levels-- only offset some new emissions.

High-tech CO2 removal is getting billions of dollars in funding now. But it costs about \$600-\$1,000 to remove one ton of CO2.

That's 10,000 times more than replicating natural processes that can get the job done.

## We know how Nature packs away CO2. We've copied her methods.

About 30 years ago, scientists figured out how to reproduce and amplify the ways that Nature removes CO2 on a large scale. They did this through "biomimicry:" sophisticated replication of natural processes.

### How can we restore a safe climate?

By implementing natural- process solutions that meet three key criteria. Climate restoration solutions must be able to

- remove CO2 permanently;
- scale swiftly and safely to remove many gigatons a year; and
- be financially feasible.

The methods we know that fulfill all three criteria are those that amplify Nature's time-tested ways. They include:

1) Boosting photosynthesis in the ocean: This turns massive amounts of CO2 into vegetation (phytoplankton), which then feeds fish and other sea life. The CO2 drifts to the depths as the plants and creatures die.

2) Augmenting Nature's way of removing methane from the air. Methane is about 80 times more powerful than CO2.

### Why aren't we already using climate-restoration scale solutions?

Most people don't yet realize that it's possible. In addition, our long-standing climate goals are only to zero-out emissions-- not to actually restore a safe climate with significant and swift CO2 removal. Action such as that has also been dubbed "geoengineering," which sounds scary.

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