

# Climate Restoration: Reclaiming a Pre-Industrial Climate by 2050

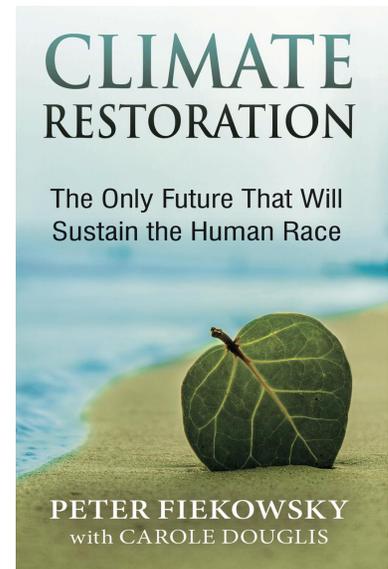
Everyone wants to restore a safe climate – one that humans have actually survived long-term. In this “pre-industrial” climate, which allowed us to develop agriculture and thriving civilizations, atmospheric CO<sub>2</sub> never rose above 300 parts per million (ppm).

Today, CO<sub>2</sub> levels are 420 ppm. Yet now we know how to bring CO<sub>2</sub> back down to pre-industrial levels—and could do so by 2050.

Today’s UN climate goals are insufficient. **Net zero by 2050 will leave our CO<sub>2</sub> level 50% higher than humans have ever survived long-term. This is a risky proposition.** Restoring our climate so that humanity may flourish is our obligation to future generations. When organizations and leaders make an explicit commitment to climate restoration, investors will feel virtuous investing in it. Policymakers can also feel secure promoting these new approaches.

Restoring our climate can be done and is beginning now. The know-how, technologies and finance already exist. Climate restoration requires investment of about \$2 billion per year—less than 1% of the transition to clean energy. We can and will do both.

**What’s needed is clarity that climate restoration is truly the goal of climate action.**



## Good news: We can restore our safe climate

We can achieve our goal of bringing CO<sub>2</sub> back down below 300 ppm by 2050. **This will require pulling a trillion tons of legacy carbon from the atmosphere.** We can do this based on natural processes, with technology we already have, and finance from the private sector, not the public.

## How will we do it?

By copying nature. Nature pulls massive amounts of CO<sub>2</sub> from the atmosphere by two main pathways: 1) Boosting photosynthesis in the ocean; and 2) forming limestone on the seafloor (from the fallen shells of sea animals). Limestone is nearly half CO<sub>2</sub> by weight and stores 99% of the carbon on the planet.



## The “Big Four” Climate Restoration Methods

1. **Ocean Iron Fertilization.** Restoring healthy photosynthesis in selected parts of the ocean also restores fisheries. Island nations and coastal communities are exploring public-private partnerships to revive fisheries while contributing to climate restoration.
  2. **Synthetic limestone.** This high-quality construction material can store CO<sub>2</sub> in our roads and buildings. It is already in use at the San Francisco International Airport.
  3. **Seaweed.** Fast-growing kelp and sargassum consume massive amounts of CO<sub>2</sub> in their photosynthesis. In mariculture farms, half the seaweed can be processed and sold as food, chemicals and other products (including vegan leather). The rest sinks and stores its CO<sub>2</sub> in the deep.
  4. **Methane oxidation.** Accelerating nature’s way of removing atmospheric methane promises to turn back global warming to the level last seen in 2000.
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### Isn't DAC climate restoration?

Direct Air Capture (DAC) concentrates CO<sub>2</sub> from the air with large fans and chemistry. The resulting CO<sub>2</sub> can be used for many purposes, especially pumping underground, usually to push more oil out of oil fields. A real climate restoration solution must remove a trillion tons of CO<sub>2</sub> permanently—and be financially viable.

DAC costs over \$500 per ton of CO<sub>2</sub> captured. Even at a fifth of that cost, removing a trillion tons through DAC and other carbontech methods would cost a hundred trillion dollars— more than world GDP.

**Since the Big Four cost taxpayers essentially nothing, pursuing carbon tech with a \$100-trillion-dollar price tag seems ill-advised.**

Climate restoration solutions use nature-based methods; work at a massive scale, cost little; produce commodities with large, existing markets; and can finance themselves through those markets. Climate restoration methods are over 100 times more cost-efficient than DAC.

**Climate restoration is an idea whose time has come.**