

Several Cutting Edge Technologies

Poised to Halve CO₂ Emissions by 2030

Bio-industrial facilities that convert CO₂ smoke emissions into algae bio-fertilizers. A tool that helps transform hazardous waste and capture graphene and other valuable materials. Procedures that can quadruple the CO₂ out of trees in the first five years of growth. At first blush, these three concepts appear disparate. But they are all cutting-edge technologies poised to help make the goal of reducing CO₂ emissions by fifty percent in the next six years a realistic achievement.

Within the past eighteen months, these technologies – and several dozen others – have moved from pilot scale to commercial use. The industrial-scale facilities that convert emissions to algae have been progressing in the research phase for years. But since early 2022, due to dramatic scientific strides, they have advanced to the stages where they are already in commercial use and are ready to be constructed, put into operation, and scaled in any part of the globe.

According to the accounts of climate specialists, if they are released at the kind of all-out tempo that, for example, vaccines were distributed globally during the

COVID-19 Pandemic, these new technologies can cut levels of CO₂ emissions by half in the next six years.

Experts on the technologies estimate that producing them at that kind of expansive rate will require more than a trillion dollars in investments. However, the models of the technologies already in commercial use illustrate that they can make profits comparable to the double-digit levels of return that private equity investments make.

This article explains what the new technologies are and how they work. Their descriptions are based on briefings by principals involved with their development. By

agreement, the companies creating the technologies are not identified pending official announcements. Most are high-profile national or international corporations.

The advances in the technologies are, in large part, the handiwork of INNOVO Profitable Net Zero. This UK headquartered company facilitates the deployment of proven, profitable, clean technologies in organizations across multiple industries worldwide.

As part of the company's mission to help achieve a fifty percent reduction in carbon emissions by 2030, INNOVO Founder and Chairman Martin Kelly and other executives have also identified the steps required to put the technologies into widescale use internationally. "Halving

global greenhouse gas emission is far beyond the capacity of any single government or country,” Kelly said in an interview. “A collaborative international corporate and governmental effort to develop and launch the technologies globally is urgent. Without it, the required CO₂ emission reductions cannot be achieved.”

Converting emissions to bio-fertilizers

The most significant and promising technology is designed to convert industrial CO₂ smoke emissions into algae-based bio-fertilizers.

INNOVO Chairman Kelly, who has worked closely with companies engaged in bio-fertilizer development over

the past eight years, summarized the steps involved in the procedure. First comes the construction of the biorefineries. They are industrial facilities that must be built close to existing industrial facilities that burn fossil fuels – coal, oil, or gas. The refineries resemble gigantic food industry mixers with a vast, intense light in the middle. The smoke and CO₂ from the oil and gas facilities are then bubbled through the biorefineries. The resulting product is an algae-rich biofertilizer. That fertilizer is then used in agriculture to reduce carbon emissions. **CLICK HERE for video that INNOVO produced illustrating this process:** <https://innovo-network.com/co2-into-bio-fertilizer>

Researchers have been working on this technology since 2016. In the early years, the prototypes were small and unprofitable, Kelly said. Advances in artificial intelligence and other scientific tools have allowed scientists to accelerate their work. In early 2022, the researchers produced facilities that make the process commercially viable.

After they slowly progressed through the research phase, INNOVO is facilitating the biofertilizer plants to be put in commercial operation in ten different locations in three countries, including China, India, and the U.S.

INNOVO executives have also pinpointed the companies capable of building the biofertilizer units on a

large scale globally and are actively engaged in forging partnerships with them.

If implemented globally, INNOVO's specialists calculate that this technology alone could halve carbon emissions globally. The reason is that more than half of the world's CO₂ emissions come from burning fossil fuels, coal, oil, and gas. And half the oxygen breathed comes from algae in the oceans. Kelly estimates that around a hundred such algae biorefineries would be needed globally to achieve the targeted fifty percent reduction by 2030.

The second most promising technology focuses on recycling waste and capturing graphite, hydrogen,

oxygen, nitrogen, pure metals, and other products from it. One of the by-products is graphene, a pure form of carbon, a valuable 'super-material' with extraordinary applications. 3-D batteries made from graphene can charge in minutes.

The process uses microwave thermal and non-thermal reactors to treat the waste. It involves no combustion, so there are no emissions. The oxygen and other by-products are then available for sale.

Since 2022, this method of transforming recycling materials has been operating on a large scale in North

American municipalities and elsewhere. Supported by an initial investment of \$1 billion in capital, it used to recycle 1,000 tons of waste daily. The original investors have pledged an additional \$46 billion as a soft commitment.

INNOVO is working with investors to deploy this technology in plants worldwide, each processing 10,000 tons daily. **INNOVO's video depicting the procedure is available here: <https://innovo-network.com/recycling-all-waste>**

INNOVO plans to sell the graphene and other outputs via Net Zero Marketplace.

A third technology can quadruple the amount of CO₂ trees absorb in their first five years. The technology will also spur the trees to grow twice the usual rate. The resulting tree canopy cover created by the new trees can be measured by satellite. A platform can then convert the new tree growth into carbon credits.

Without this technology, most trees planted today would not significantly reduce CO₂ before 2030. At that stage, it will be too late for them to have an impact.

This procedure is already in use in various locales worldwide. In 2022, with the guidance of officials from the United Nations, a plan to plant a billion new trees in the desert of Mongolia was launched. In the U.S. state of Louisiana, a canopy of four million trees has been created.

INNOVO, is engaging with over 60 companies in the U.S., China, India, and more than a dozen other countries, has also helped spur the development of more than three dozen other technologies focused on CO₂ reduction and bringing them into commercial use. **A complete portfolio of the technologies is viewable here:** <https://innovo-network.com/technologies>

It includes the following:

- A solution that reduces the formation and emission of odors, ammonia, and GHGs from stored manure, The solution is a powdered additive for treating the liquid manure of dairy cows. Use of the product can reduce the emissions of Methane up to 23 percent of CO₂ up to 22 percent, nitrous oxide up to 100 percent, and ammonia up to 100 percent.
- A bio-based insulation batt made from grass with a negative carbon footprint (capturing 1.5 kilograms of CO₂ per kg of product). It can be used to enhance the energy efficiency of buildings.

- A kinetic energy system for HGVs. An electric motor/generator is fitted to the truck's drivetrain. During braking, this machine acts as a generator, slowing the vehicle and storing electricity in graphene ultra-capacitors. During acceleration, this machine acts as a motor, drawing electricity from the ultra-capacitors and providing power to accelerate the vehicle, significantly reducing fuel consumption.

Under the leadership of Kelly, INNOVO has devoted the past 12 years to building partnerships with the companies committed to the research, development, and funding needed to make these carbon-reducing technologies not only viable but also commercially profitable.

Martin and other key INNOVO executives promoting the technologies have given this reporter a series of in-depth briefings on the technologies. They have asked that the names of the corporate partners and technology providers not be revealed pending public announcements.

INNOVO executives identified two critical hurdles to their rapid production of the technologies and their wide-scale use across the globe.

The first is funding. The cost to achieve the envisioned expansion rates would run into several trillions of dollars over six years. A combination of private companies, investors, and philanthropists would be needed for those investments. While an extraordinary group of companies and investors have already agreed to work with INNOVO, far more significant investments are required. “When they are first approached, some corporations think that while such investments might be a nice thing to do, they don’t make good business sense,” said Rene de Murard,

CEO of INNOVO. “Of course, their conclusion is wrong. A big part of our job is showing them that investments in these technologies are profitable.”

All of the technologies in INNOVO’s portfolio have demonstrated that they can yield a significant return on investment. The facilities that transform emissions into algae fertilizer have been estimated to yield nearly a 17 percent ROI.

Governmental cooperation has also proven to be a roadblock. “Inertia sometimes makes it hard for governments to offer the kind of regulatory support

needed to introduce the technologies at the needed pace,” Kelly said.

The 2023 United Nations Climate Change Conference (COP 28), which will take place in late November and December in Dubai, offers a setting for addressing the funding and the search for governmental collaboration.

The conference aims to fast-track a just, orderly, and equitable energy transition, fix climate finance, put nature, lives, and livelihoods at the heart of climate action, and enhance inclusivity.

But the need to save the planet poses a more pressing deadline. Climate scientists concur that the rush of climate-related catastrophes occurring in 2023, including massive flooding in China, Texas, Libya and other corners of the globe, unprecedented forest fires in N. America and Europe serve as a wake-up call that actions must be taken urgently. By the account of most climate experts, if the kinds of CO₂ emission reduction goals that are projected are actually met, the benefit will be a significant mitigation in the pace and force of the violent storms and other extreme acts of nature that are currently punishing the earth.

Written by:
Gary Lee

Gary Lee, is a prominent environmental journalist who has served as National Environment Correspondent for The Washington Post and Time Magazine. - [Gary Lee \(journalist\) - Wikipedia](#). He has been nominated twice for a Pulitzer Prize. Lee has been on the Advisory Board of the Society of Environmental Journalists.

Gary Lee volunteered to write several articles on INNOVO and Climate Change issues because of their importance.

In appreciation of this contribution, INNOVO is remunerating him.