

2022 ANNUAL REVIEW

ACTING
LIKE IT IS
A CLIMATE
EMERGENCY

TERRA
PRAXIS

2022 ANNUAL REVIEW

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2022 IN REVIEW

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Powered by philanthropy,
Terra Praxis innovates, designs,
and accelerates scalable,
equitable climate solutions.

A MESSAGE FROM OUR CO-FOUNDERS

Dear Friends,

Widespread impacts from climate change are already here. Our actions in this critical decade will determine the full extent of future impacts on our children and grandchildren.

Profound challenges to achieving decarbonization by 2050 include the continued reliance on coal for power generation and liquid fuels for transport and industry; the complexity of switching over trillions of dollars of existing energy infrastructure to emissions-free generation; and the urgent need to invest an equivalent amount in building new electrification infrastructure.

Unfortunately, current plans for decarbonization — based on unrealistic energy modeling — are insufficient and have major unacknowledged risks to their implementation. Carbon emissions continue to rise, year on year, despite increasing deployment of low cost renewables. That's why one of our key programs at Terra Praxis is transforming energy systems modeling to fully account for the risks and opportunities to achieve decarbonization within climate timescales.

Terra Praxis is designing realistic strategies for decarbonization that can achieve the costs, scale, and speed required to enable a carbon-negative economy and put the world on a fast path to Net Zero by 2050. These realistic strategies enable us to build powerful coalitions around a just transition that will expand global access to energy, infrastructure, skills, and capital, and deliver healthy, prosperous lives for all.

With our world-class sustainability partners, Terra Praxis is the only entity (unfortunately!) designing a scalable, rapid repowering system to decarbonize the entire global coal fleet by 2050. This is how we plan to eliminate one third of global carbon emissions and provide a method for supplying affordable, reliable, and emissions-free energy to billions of people. With global coal consumption reaching record highs in 2022, solutions like this are needed now more than ever.

In 2023, your support will enable us to build on these strong foundations to decarbonize the global coal fleet and de-risk the energy transition. We are in a climate emergency — now is the time to start acting like it's an emergency.

With gratitude,
Kirsty Gogan & Eric Ingersoll



WHO WE ARE

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Terra Praxis is designing transformative strategies to address the greatest risks to the energy transition — mapping uncharted decarbonization territory.

Terra Praxis team members, at Microsoft-Terra Praxis strategic collaboration agreement signing ceremony.
(Photo: Terra Praxis, 2022).

OUR MISSION, VISION, & THEORY OF CHANGE

MISSION

We innovate and accelerate scalable, equitable solutions for unsolved areas of the climate challenge.

VISION

Universal access to affordable, reliable, and clean energy that empowers people and protects nature.

THEORY OF CHANGE

Repurposing existing infrastructure to run on emissions-free energy and produce emissions-free fuel is a practical, achievable, scalable, and equitable way to reach Net Zero by 2050.

OUR VALUES IN ACTION

Terra Praxis is acting like it is a climate emergency:

- We are acting on the urgency and scale of the climate emergency.
- We leverage the power of the market to scale.
- We build coalitions of diverse public and private sector stakeholders to address complicated coordination problems.
- We are outcomes-driven.
- We build climate justice and equity into our solutions.
- We are technology inclusive.
- We design solutions that do not depend on individual behavior change.

OUR DIFFERENCE

Terra Praxis is trailblazing in the following areas:

1. INDEPENDENT THOUGHT LEADERSHIP

Our thought leadership delivers viable solutions to unsolved areas of the climate challenge. For example, Terra Praxis is leading the creation of practical pathways to enable the repowering of the global coal fleet with clean energy by 2050. Currently, the global coal fleet is the largest source of carbon emissions, most of which is unlikely to be prematurely retired.

2. STAKEHOLDER-BASED SOLUTION DEVELOPMENT

Terra Praxis is uniquely positioned as a nonprofit organization to enable collaboration among governments, regulators, academics, and industry competitors to design solutions to meet the cost, speed, scale, space, and supply chain requirements of the global energy transition.

3. SOLUTION-BASED ADVOCACY

We advocate for solutions that are critical but do not yet exist. We mobilize broad coalitions of public and private sector global leaders to drive a supportive policy/regulatory environment and global market adoption so that our solutions take on a life of their own.

“I joined Terra Praxis’ Board of Directors because of their clear-eyed approach to climate change and for seeing the climate problems as big as they are.

Terra Praxis has a critical role to play in changing the trajectory of the energy transition and providing energy access worldwide. I want my legacy to be contributing to that impact.”

— Ellen Baum,
Terra Praxis Board Member

OUR BOARD OF DIRECTORS

We are governed by an independent board of volunteers who are dedicated to the vision and mission of the organization.

Ellen Baum

Director, Climate & Health Research Network

After a successful career that included Senior Scientist at the Clean Air Task Force, focused on pollutants with air and climate impacts; a forester in one the US's most forested states; and a consultant and lobbyist on a range of state and national environmental issues, Ellen founded the Climate and Health Research Network in 2014, an NGO targeting GHG mitigation and zero-carbon technologies.

Ellen has taught environmental studies at Colby College in Waterville, Maine. Over the past 40 years, she has served on numerous environmental and civic boards.

Jacopo Buongiorno

Professor, Massachusetts Institute of Technology (MIT)

Jacopo is the TEPCO Professor of Nuclear Science and Engineering at the Massachusetts Institute of Technology (MIT), and the Director of Science and Technology of the MIT Nuclear Reactor Laboratory.

Jacopo teaches a variety of undergraduate and graduate courses in thermo-fluids engineering and nuclear reactor engineering. He has published over 100 journal articles in the areas of reactor safety and design, two-phase flow and heat transfer, and nanofluid technology. Jacopo is the Director of the Center for Advanced Nuclear Energy Systems (CANES).

Kirsty Gogan

Founding Director & Co-CEO, Terra Praxis

Kirsty is an internationally-recognized leader in the design and deployment of scalable strategies to address global climate and energy needs.

Kirsty has served in various roles for the UK Government, including at 10 Downing Street, and the Office of the Deputy Prime Minister. She led the national public consultation on nuclear new build sites, reviewed the national communications response to Fukushima, and revised the UK Civil Nuclear Emergency Planning and Response Guidance. She is a member of the Government's Nuclear Innovation Research and Advisory Board (NIRAB) and is the UK representative on the International Atomic Energy Agency (IAEA) Director General's Special Advisory Group on Nuclear Applications.

Eric Ingersoll

Founding Director & Co-CEO, Terra Praxis

Eric is a strategic advisor and entrepreneur with deep experience in the development and commercialization of new energy technologies. He has extensive project and policy experience in renewables, energy storage, oil and gas, and advanced nuclear technologies.

Eric develops commercialization and market entry strategies for advanced energy technologies such as advanced nuclear power generation, carbon capture, and zero-carbon liquid fuels. Eric was a member of the renewable energy advisory group of the National Commission on Energy Policy (NCEP), and was honored by the Obama White House as a Champion of Change: Innovator In Renewable Energy.



OUR BOARD OF DIRECTORS

Amy Roma

Partner & Global Energy Practice Leader,
Hogan Lovells US LLP

Amy is a global thought leader on energy matters, including energy transition and security, with a focus on nuclear power and fusion.

Amy has spearheaded many first-of-a-kind, cutting-edge energy projects and been recognized as one of the Top 10 most innovative lawyers in North America by the *Financial Times* and by the *National Law Journal* as one of the Top 50 “great minds impacting the crucial intersection of energy production and the environment.” Amy is a prolific writer and public speaker on energy matters and an active humanitarian, leading a variety of high impact pro bono efforts.



Ray A. Rothrock

Venture Capitalist / Philanthropist

Ray is a venture capitalist, cyber expert, clean energy advocate, and philanthropist. His 35-year venture capital career has focused on early stage, cyber, AI, energy, and space, with 50+ deals which resulted in 9 IPOs and multiple listings on the Forbes Midas List.

Ray serves on public boards, NGOs, and foundations. In particular, he is a director of the nonprofit Nuclear Threat Initiative and is a member of the Council on Foreign Affairs. Ray is a frequent invited speaker and has testified before Congress and spoken at the White House on venture capital, cyber issues, energy policy, nuclear energy, and climate change.



Romana Vysatova

Productions & Operations Manager,
Terra Praxis

Romana has worked with the founders of Terra Praxis and LucidCatalyst since their inception. Previously, as co-founder of LucidStrategy, she helped develop product, market, marketing, organizational, and investment strategies and written dozens of business plans for companies and nonprofits seeking investment.

Romana also worked with First Chicago to establish a Venture Capital fund in China; with Drexel Burnham Lambert in the Mergers & Acquisitions in New York; with the White House Domestic Policy Council; and the US Department of Agriculture; leading a Reinventing Government initiative to integrate and streamline rural economic development programs across Federal agencies.



Andrew Whittaker

SUNY Distinguished Professor
at the University at Buffalo

Andrew is a State University of New York (SUNY) Distinguished Professor in the Department of Civil, Structural and Environmental Engineering at the University at Buffalo. He is a registered civil and structural engineer in the State of California, with expertise in seismic isolation.

Andrew has published more than 150 peer-reviewed journal articles, 11 books and book chapters, and more than 375 other papers and technical reports. He made significant contributions to the first generation of tools for performance-based earthquake engineering and led the structural engineering team that developed the second generation of these tools. He is Chair of the ASCE Nuclear Standards Committee.



“We support Terra Praxis because we believe that climate change is a big and urgent problem, and emissions from traditional energy sources are a major contributing factor. Terra Praxis brings together the right team and a thoughtful, deliberate approach to building scalable solutions in this area.”

— Shawn Low & Elizabeth Mak,
Terra Praxis Donors, based in Singapore



OUR TEAM

Thanks to your support, we were able to grow our team in 2022, adding a Chief Technology Officer, Chief Operating Officer, Chief Development Officer, Director of Special Initiatives, and Executive Assistant.

Our deeply motivated, highly qualified team is acting like it's a climate emergency by developing the civilization-scale solutions we need to put the world back on track to Net Zero.

The Terra Praxis team:

Justin Aborn, Chief Scientist
Miriam Aylward, Chief Operating Officer
Chirayu Batra, Chief Technology Officer
Kirsty Gogan, Founding Director & Co-CEO
John Herter, Director of Projects
Paul Hohenberger, Director of Special Initiatives
Eleanor Holloway, Executive Assistant
Eric Ingersoll, Founding Director & Co-CEO
Malisol Ohirko, Head of Events
Megan Pulliam, Chief Development Officer
Romana Vysatova, Production & Operations Manager
Ian Woodhouse, Program & Research Manager

Terra Praxis team (left to right / top to bottom):
Justin, Miriam, Chirayu, Kirsty, John, Paul, Eleanor, Eric, Malisol, Megan, Romana, Ian.

OVERVIEW OF OUR SOLUTIONS

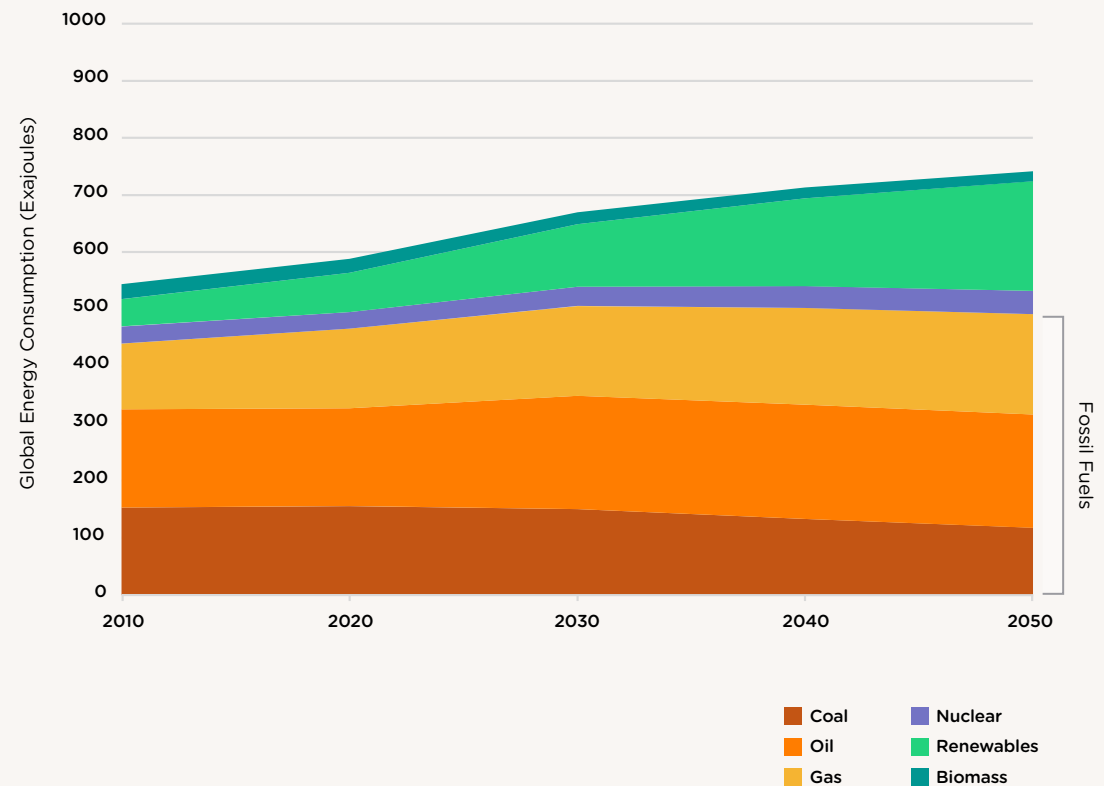
3

Participants Q&A Polls Chat Share Screen Raise Hand

We are designing strategies to accelerate the reduction of global carbon emissions by repurposing trillions of dollars of existing infrastructure to supply affordable, reliable, and emissions-free energy.

“We have to decarbonize our economy and double, or even triple our overall energy supply to meet global energy demand. Terra Praxis is unique in focussing on what is required to achieve that end state, rather than working within the confines of current solutions.”

— Kirsty Gogan,
Terra Praxis Founding Director & Co-CEO



OUR STRATEGY

CLIMATE X PROSPERITY

Launched in 2021, Terra Praxis is a nonprofit organization that exists to de-risk the energy transition.

Terra Praxis was born out of the realization that there is a widening gap between decarbonization policy targets and the real world of project deployment. It is highly probable that the world will fail to achieve Net Zero emissions by 2050 and experience catastrophic climate change in this century unless new solutions are pursued at speed and scale.

Terra Praxis shines a light on risks to the transition that are constraining the deployment of clean energy (e.g., land availability, transmission build, public support/opposition, and project risk). With this clear-eyed perspective, Terra Praxis then designs and innovates scalable solutions in response to these challenges.

Terra Praxis leads deep engagement with industry, governments, regulators, academic institutions, energy systems modelers, and other NGOs to diversify and expand the range of tools available for deep decarbonization — ensuring the broad range of applications for emissions-free heat sources (for coal plant conversion, clean hydrogen, synthetic fuels production, and flexible co-generation) are — for the first time — fully represented in climate and energy models, policies, and market solutions.

International Energy Agency's State Policies Scenario: World Energy by Source. (International Energy Agency, 2021).

“Terra Praxis is at the absolute center of the world’s innovation to cut the cord between power and carbon, while enabling the world to continue to rely on the power plants that have been built and the infrastructure that already exists.”

— Brad Smith,
Microsoft Vice Chair & President

OUR SOLUTIONS

REPOWER: DECARBONIZING THE GLOBAL COAL FLEET BY 2050

Terra Praxis is leading a global consortium to design a fast, low-cost, and repeatable system for replacing the coal burners in coal-fired power plants with non-emitting heat sources, enabling continued operation of a sizable portion of the existing power plant — without emissions. Decarbonizing coal plants leverages existing sites, infrastructure, transmission lines, industry knowledge, workforces, capital, and supply chains to accelerate the clean energy transition. It also ensures continuity for communities reliant on existing power plants for energy, jobs, tax revenue, and continued economic development. Decarbonizing coal plants would eliminate almost one-third of global net annual CO₂ emissions or around 15 billion tonnes of CO₂ from the planet per year.

DESIGNING FOR THE ENERGY TRANSITION CONSTRAINTS

Terra Praxis is leading a deep engagement with other NGOs, policymakers, political leaders, and energy systems modelers to de-risk the energy transition by shining a light on deployment feasibility constraints and the broad range of applications and deployment models for nuclear technologies to ensure they are fully represented in climate and energy models, policies, and market solutions.

CLEAN SYNTHETIC FUELS

Terra Praxis’ thought leadership defines a pathway to deliver clean synthetic fuels and hydrogen to replace oil and gas in the difficult-to-electrify sectors of shipping, aviation, and heavy industry at the costs, speed, and scale necessary to outcompete fossil fuels within 10 years. Terra Praxis is revolutionizing a solution for how modern shipyard manufacturing and floating power plants on ships could dramatically increase the global energy supply, without requiring massive amounts of land.

ATMOSPHERIC CARBON CAPTURE

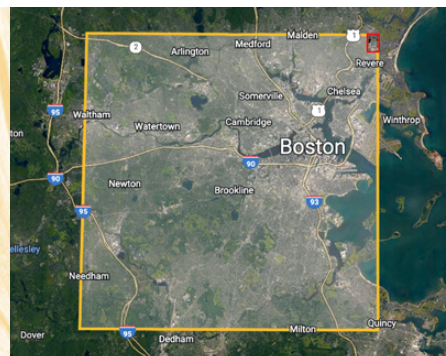
Terra Praxis identified a technology development opportunity and designed a conceptual plan for large-scale atmospheric carbon capture at emissions-free generators, such as existing nuclear plants and repowered coal plants. By re-using existing cooling towers and requiring modest incremental energy to add atmospheric carbon removal to the existing cooling process, this system has the potential to be one of the lowest cost atmospheric carbon removal technologies. We are currently working with partners to explore how this opportunity might be moved forward and plan to publish our work.



Coal plant showing how it could be repowered with small modular reactors. (Terra Praxis, 2022).



Ammonia bunker offloading ammonia from a synthetic fuels production platform. (LucidCatalyst, 2019).



Demonstrative land size required to repower 1GW coal plant with nuclear (red) vs. renewables in the winter (yellow). (Terra Praxis, 2022).



Existing cooling towers could capture carbon from the air. (Dukovany Nuclear Power Plant — Wikimedia Commons, 2022).

A photograph of three people at a signing ceremony, overlaid with a semi-transparent orange filter. On the left, a man with glasses and a dark suit is smiling. In the center, a woman with curly hair and a floral patterned top is also smiling. On the right, a man in a dark suit is reaching out towards the woman. They are seated at a dark table with some papers and a pen. The background is a textured, light-colored wall.

OUR PROGRAM HIGHLIGHTS

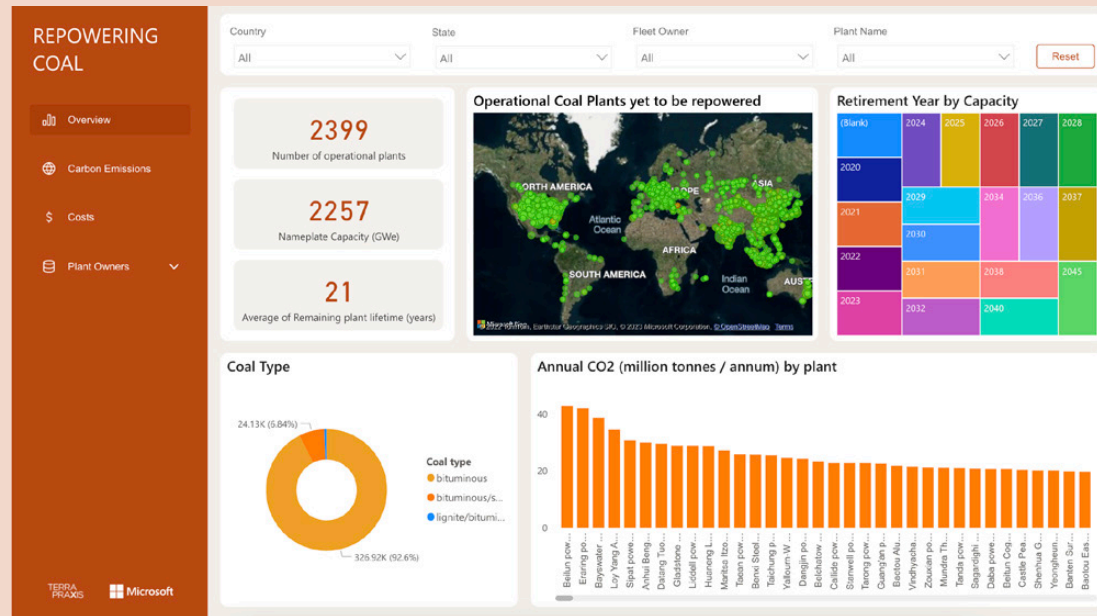
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Our thought leadership is building a shared vision for energy prosperity and decarbonization that is gaining traction with global sustainability leaders.

Microsoft-Terra Praxis
strategic collaboration
agreement signing ceremony.
Microsoft Vice Chair &
President Brad Smith with
Kirsty Gogan & Eric Ingersoll.
(Photo:Terra Praxis, 2022).

“As part of this pivotal moment to reach Net Zero, we are proud to partner with Terra Praxis to help transition one of the world’s largest sources of carbon (coal) to zero emissions.”

— Gary Lawrence,
Schneider Electric, Power & Grid Segment President



REPOWER: DECARBONIZING THE GLOBAL COAL FLEET BY 2050

TERRA PRAXIS IS TRANSFORMING THE GLOBAL NARRATIVE AROUND THE SOLUTION TO COAL

Terra Praxis’ decarbonizing coal plants solution has enabled a paradigm shift in how many major entities — including governments, the International Energy Agency, the US Department of Energy, regulators, the International Atomic Energy Agency, major companies, power plants, utilities, and heat source vendors — think about how to tackle coal and climate change.

Terra Praxis’ solution was featured by the US Department of Energy and the International Energy Agency in their landmark

publications in 2022. Our thought leadership and convenings at 30 international climate events, transformed the global narrative from ‘phasing out’ coal-fired power plants — as agreed upon at COP26 — to repowering coal plants with emissions-free heat sources to accelerate a clean and equitable energy transition.

Together with Microsoft Vice Chair & President Brad Smith, Terra Praxis launched the first version of our open-access EVALUATE application at COP27. This application enables governments, coal plant owners, investors, and project developers to quickly evaluate the site-specific business case for repowering a plant or fleet of plants. Current features include estimated project costs and savings, reduced carbon emissions, and the potential for adding skilled jobs. Planned upgrades include a bottom-up cost model, preliminary conceptual design information, multiple reactor types, and site-specific hazard analysis.

Terra Praxis EVALUATE application, global coal plant data overview. (Terra Praxis / Microsoft, 2022).

Microsoft-Terra Praxis strategic collaboration agreement signing ceremony. Microsoft Vice Chair & President Brad Smith with Kirsty Gogan & Eric Ingersoll. (Terra Praxis, 2022).

Terra Praxis work featured in landmark publications by IEA and US DOE.

06.30.22

The International Energy Agency's report, which concludes that achieving Net Zero globally will be more difficult without nuclear and highlights Terra Praxis' initiative as a vehicle to achieve decarbonization by repowering retired coal plants globally with clean energy. *"Various initiatives can facilitate the replacement of coal-fired plants with SMRs (small modular reactors), such as that of Terra Praxis which aims to prepare standardized and pre-licensed designs supported by automated project development and design tools."*

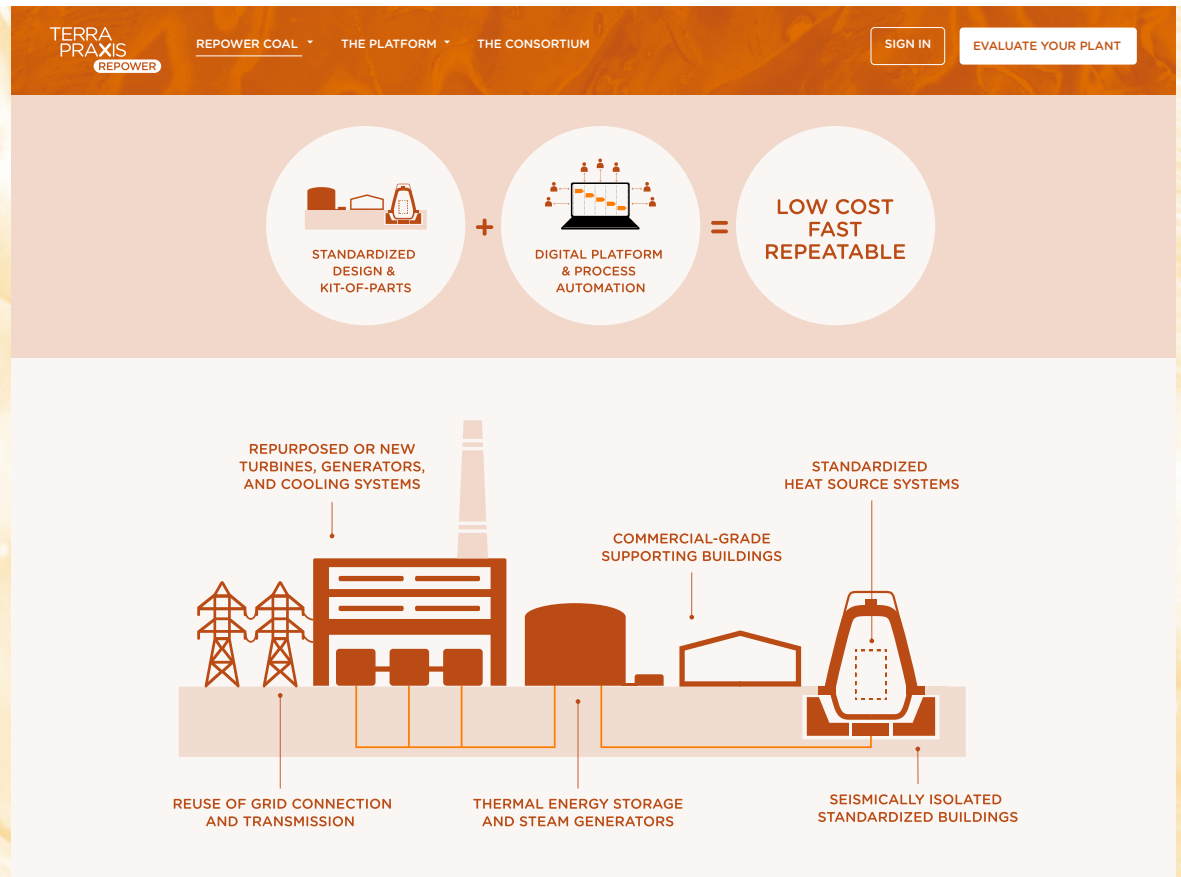
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The US Department of Energy's report, which corroborates the technical and cost benefits of repowering coal plants with emissions-free heat sources outlined by Terra Praxis, including decreased capital costs, reduced energy costs, and increased economic activity. The report concludes that *"80% of retired and operating coal power plant sites that were evaluated within a sample of 394 have the basic characteristics needed to be considered amenable to host an advanced nuclear reactor. The study team found regional economic activity could increase by as much as \$275 million and add 650 new, permanent jobs to the region of analysis."*

TERRA PRAXIS IS DESIGNING A STREAMLINED PROJECT DELIVERY MODEL FOR RAPIDLY DECARBONIZING THE GLOBAL COAL FLEET BY 2050

Because none of the existing companies or other stakeholders have the incentive to create a scalable rapid repowering system, Terra Praxis is convening a global consortium of regulators, academics, coal plant owners, utilities, heat source vendors, and industry stakeholders to develop an open-access conceptual standardized building system and project delivery model for the fast, low-cost, and repeatable repurposing of 2-Terawatts of carbon-intensive coal plants to run on emissions-free heat (advanced fission, fusion, and geothermal) by 2050.

This year, Microsoft, Schneider Electric, and Terrestrial Energy were the latest delivery partners to join the REPOWER Consortium



— in addition to existing partnerships with Bryden Wood, MIT, and the University at Buffalo.

The Terra Praxis REPOWER building system embraces key design innovations to enable standardization while accommodating coal fleet diversity. These include seismic isolation, 'kit-of-parts'-based design, standardization of supporting systems across multiple heat source vendors, and a 'universal connector' heat transfer and storage system. The standardized 'kit-of-parts' design will allow for a variety of emissions-free heat sources to replace the coal burners in whole fleets of coal-fired power plants, while significantly utilizing the other existing systems in the balance of the plant. The result will be a dramatic reduction in regulatory licensing scope, project duration, project costs, and commercial risks to budget and schedule to enable the rapid decarbonization of coal plants to achieve Net Zero emissions by 2050.

Terra Praxis REPOWER website (supporting the EVALUATE app) and demonstrating the standardized 'kit-of-parts' design. (Terra Praxis, 2022).

“Nuclear energy is an ‘indispensable tool’ for achieving the sustainable development goals (SDGs). It has a crucial role in providing affordable energy and climate change mitigation, as well as eliminating poverty, achieving zero hunger, providing clean water, economic growth, and industry innovation.”

— Expert Group on Resource Management of the United Nations Economic Commission for Europe (2021)



ADDRESSING THE CONSTRAINTS TO THE ENERGY TRANSITION

WE ARE CALLING FOR EVIDENCE-BASED DECISION MAKING TO ACHIEVE NET ZERO

The original impetus for this program followed our team's deep analysis of the energy transition risks constraining greenfield renewable projects from being completed in the US (including MD, PA, CA, MI, CO, IA, and New England), UK, and Germany.

The team found a widening gap between decarbonization models, climate policy targets, and the reality of project development. Contrary to what mainstream Net Zero modeling suggests — land availability, transmission build, and public support/opposition are prominent among the project risks

constraining the broad deployment of renewable energy. These risks can be hedged through a complementary strategy of repowering existing sites with emissions-free heat sources.

For example, complementing a renewables strategy by repowering existing power plant sites with emissions-free heat sources would enable significant clean energy capacity additions without requiring greenfield project development or new transmission lines. Diversification is a well-established risk reduction strategy. Diversifying decarbonization means pursuing a portfolio of solutions that do not all share the same risks.

Because today's energy systems modeling does not take these deployment risks into account, Terra Praxis is working to transform modeling and accelerate the clean energy transition by advocating for decarbonization strategies that achieve the deepest risk-adjusted reductions in carbon emissions.

Kirsty Gogan launching the [*Beautiful Nuclear*](#) report at Nordic Nuclear Forum. (Terra Praxis, 2022).

Terra Praxis recently launched *Beautiful Nuclear: Driving Deep Decarbonization* at the Nordic Nuclear Forum where Kirsty Gogan gave the keynote address and chaired a panel discussion. The report, featured in *World Nuclear News*, was peer reviewed by over 35 global climate and energy experts and endorsed by over 20 climate NGOs.

The *Beautiful Nuclear* report shows how nuclear energy helps meet all 17 of the United Nations Sustainable Development Goals. No other electricity generation technology can match this diversity of beneficial impacts. It emphasizes that the priority for preventing irreversible climate change is decarbonization, not the creation of energy systems that are 100% dependent on renewables. In the context of the increasing urgency of the need to replace fossil fuels, the case for expanding the range of emissions-free options, including nuclear, is crucial. *Beautiful Nuclear* calls for a whole system approach to the energy transition and for evidence-based decision making. It advocates for extending the resources and effort that has successfully driven down the cost of solar and wind energy and accelerated their deployment, to all emissions-free technologies.

TERRA PRAXIS IS DESIGNING BEST PRACTICES FOR GLOBAL MODELING TO ENABLE A MORE REALISTIC PICTURE OF WHAT IS NEEDED TO ACHIEVE NET ZERO

As leaders in analyzing local opposition and siting challenges, the Terra Praxis team has identified several areas to improve energy systems modeling. We will develop a 'Data Book' (including inputs, procedures, and approaches) to support

global modeling organizations in representing energy transition risks, deployment feasibility, and the range of applications and deployment models of nuclear technologies to enable a more realistic picture for investors and policymakers of what is possible on the path to Net Zero.

TERRA PRAXIS IS INFLUENCING SUPPORT FOR TECH-NEUTRAL CLIMATE POLICIES

The Terra Praxis team has had a significant impact on influencing policymakers to overturn moratoriums on nuclear power and support technology-neutral decarbonization policies that optimize the reuse of existing technologies.

Terra Praxis team members were instrumental in initiating and contributing to *An Assessment of the Diablo Canyon Nuclear Plant for Zero-Carbon Electricity, Desalination, and Hydrogen Production*, a report that played a pivotal role in influencing lawmakers to vote this year to extend Diablo Canyon Power Plant's operation amid significant concerns around grid reliability in California.

The Terra Praxis team has also played a critical role in influencing legislators in Virginia to pivot from passing a 100% renewables mandate to a 100% clean energy mandate, allowing for the inclusion of emissions-free heat sources (e.g., advanced fission and fusion). We briefed stakeholders in other states (including CA, PA, and MD) on the risks and challenges of building the emissions-free infrastructure necessary to enable their energy transitions. These briefings highlighted the vital role of clean, dispatchable generation and the importance of leveraging the existing energy infrastructure as much as possible.

“In today’s context of the global energy crisis, skyrocketing fossil fuel prices, energy security challenges, and ambitious climate commitments, I believe nuclear power has a unique opportunity to stage a comeback.”

— Fatih Birol,
International Energy Agency
(IEA) Executive Director

“Nuclear is beautiful because its tiny land use and lifecycle footprint protects nature and delivers civilisation-scale, abundant clean energy. Both of these are fundamental to our future health, well-being and prosperity on this planet.”

Kirsty Gogan, LucidCatalyst & TerraPraxis

Kirsty quoted in
*Beautiful Nuclear:
Driving Deep
Decarbonization.*
(Terra Praxis, 2022).

07.14.22

Terra Praxis informs a report published by LucidCatalyst & ClearPath: *Hawkeye State Headwinds: A Case Study of Local Opposition & Siting Challenges for Large Scale Wind Development In Iowa.*

10.11.22

Terra Praxis informs a report published by Clean Air Task Force & Environmental Defense Fund: *Growing the Grid: A Plan to Accelerate California’s Clean Energy Transition.*



CLEAN SYNTHETIC FUELS

TERRA PRAXIS IS CHANGING THE NARRATIVE AROUND THE SOLUTION TO OIL & GAS

Today, the world uses roughly 100 million barrels of oil and gas daily. While having made progress in replacing some of that direct use with electrification, much of the remaining consumption is in difficult or expensive sectors to electrify. These sectors include marine shipping, aviation, long-haul road transport, heavy machinery, flexible power generation, and sectors for which fossil fuels are inputs in industrial and chemical processes. For this reason, oil and gas consumption will continue to dominate into mid-century, putting us on a path of catastrophic climate change unless we develop emissions-free alternatives that compete on price and performance.

Terra Praxis' independent thought leadership has spurred a commercialization pathway for how new deployment strategies for advanced fission heat sources via modern shipyard manufacturing have the potential to produce and deliver enough affordable, reliable, and emissions-free clean synthetic fuels and hydrogen to outcompete fossil fuels within 10 years.

TERRA PRAXIS' THOUGHT LEADERSHIP SETS OUT A NEW DEPLOYMENT MODEL FOR SHIPYARD MANUFACTURING 'GIGAFACTORIES'

Terra Praxis is revolutionizing a solution for how modern shipyard manufacturing and floating clean power plants on ships could dramatically increase the global energy supply, without

requiring massive amounts of available land or impact on ocean and marine life.

Today, the world has around 280 shipyards working at roughly 50% of average capacity. Suppose we utilize even a small part of this available capacity to build ship-based clean power plants of various configurations. In that case, shipyard manufacturing 'Giga factories' could add hundreds of gigawatts of affordable, reliable, and emissions-free energy to the global energy supply.

These floating power plants could be deployed to regions lacking access to electricity, such as coastal cities in Africa and South East Asia, to increase global energy access. This would have a twin effect of decreasing developing nations' demand and dependence on fossil fuels as they grow their economies.

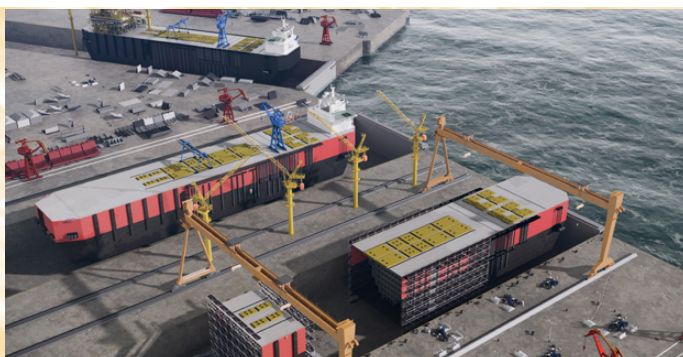
TERRA PRAXIS IS RECRUITING ADVOCATES & INFLUENCING PUBLIC POLICY FOR CLEAN SYNTHETIC FUELS & HYDROGEN

Terra Praxis' Co-Founders were honored to contribute a foreword and a chapter to the Nuclear Innovation: Clean Energy Future (NICE Future) initiative's Nuclear-Hydrogen Digest putting Clean Synthetic Fuels on the radar of key policymakers.

Terra Praxis partners with the NICE Future initiative, which is an international initiative of the Clean Energy Ministerial that leads the global conversation on the roles nuclear energy can play in clean energy systems of the future. The NICE Future digest showcases examples of leading nuclear-produced hydrogen initiatives that can be used to power hard-to-electrify sectors such as transport and heavy industry.

“Various initiatives [are being developed that] can facilitate the replacement of coal-fired plants with SMRs, such as that of Terra Praxis which aims to prepare standardised and pre-licensed designs supported by automated project development and design tools.”

— International Energy Agency (IEA), [Nuclear Power & Secure Energy Transitions: From Today's Challenges to Tomorrow's Clean Energy Systems](#)



Manufacturing of clean synthetic fuels production platforms based on shipyard manufacturing. (LucidCatalyst, 2019).



Clean synthetic fuels gigafactory

A report by TerraPraxis


TERRA PRAXIS

Terra Praxis chapter in [Nuclear-Hydrogen Digest: Nuclear Energy in the Hydrogen Economy](#). (NICE Future, 2022).



OUR EVENT & MEDIA REACH

5



Our thought leadership has enabled a shift in thinking on climate change solutions, and the difficult-to-decarbonize sectors of coal-for-power, industrial heat, and heavy transport.

Kirsty Gogan presenting
at Energy Disruptors.
(Photo: Terra Praxis,
2022).

OUR REACH

30

Participated in **30 climate events**, connecting **35,000+ people** across **175 countries**.

Gave **50 presentations**, (including **19 keynotes and live interviews**).

4

Secured partnerships with **4 industry sustainability leaders**.

Led **4 public-private sector workshops**.

Met with **leaders from 25 government and global entities**.

10

Contributed to **10 reports** by governments, intergovernmental organizations, nonprofits, and industry partners.

Created **123 social media posts** and **17 videos**, (reposted **971 times**).

50

Featured in **50 leading global and national media outlets**.

Issued **8 press releases**, picked up by **1000+ news and media outlets** with translations into **8 languages**.

Data is based on
January – December
2022 activities.



Here are some Terra Praxis' event highlights. [To see a full list of our 2022 events, please visit our website.](#)

ON A GLOBAL STAGE

Terra Praxis hosted and participated in more than 50 keynote and event presentations alongside government officials, investors, energy providers, and industry leaders — putting our innovative solutions on global climate change agendas.

CERAWeek

7 – 11 March 2022 in Houston, US

Terra Praxis validated our REPOWER solution with global energy leaders from around the world representing utilities, investors, environmental groups, and governments at CERAWeek, the world's largest energy conference. We made decarbonizing coal plants a key focus during three keynote speaking opportunities, including a best-attended main-stage

event, as well as three full days exhibiting our solution in the high-profile Microsoft Agora House. Global energy leaders were able to view a beta-version of our EVALUATE application to assess individual plants as they are today, the potential for repowering, and the potential carbon emissions savings.

CLIMATE WEEK 2022

22 – 23 September 2022 in New York City, US

Brad Smith, Microsoft Vice Chair & President, championed Terra Praxis REPOWER at Climate Week 2022. Kirsty Gogan and Eric Ingersoll joined Brad Smith on the main stage for Microsoft's Sustainability Briefing, where he announced how Microsoft's collaboration with Terra Praxis is a key example of how Microsoft-enabled digital technologies could accelerate the low-carbon energy transition.

Ian Woodhouse, Eric Ingersoll & Justin Aborn showcasing REPOWER at CERAWeek. (Terra Praxis, 2022).

Kirsty Gogan presenting REPOWER to Maria Korsnick, Nuclear Energy Institute President & CEO; John Hopkins, NuScale President & CEO; at CERAWeek. (Terra Praxis, 2022).

Moderator Holly Ransom with Kirsty Gogan, Ashish Sethia, Evan Siddall & Dan Balaban at Energy Disruptors: UNITE Summit in Calgary, during Climate Week 2022. (Energy Disruptors, 2022).

“I am excited to be working with Terra Praxis to leverage key innovations that can transform the delivery of emissions-free heat sources to accelerate the energy transition.”

— Andrew Whittaker,
Terra Praxis Board Member, SUNY Distinguished Professor
at the University at Buffalo & leading seismic expert



GLOBAL CLEAN ENERGY ACTION FORUM (13 CLEAN ENERGY MINISTERIAL)

22 – 23 September 2022 in Pittsburgh, US

Terra Praxis participated in high-level sessions at this convening of more than 5,000 government ministers, clean energy advocates, and industry professionals focused on climate and energy. Sessions discussed solutions for the most pressing challenges toward Net Zero and the potential role of emissions-free sources to reach this goal by 2050.



COP27

6 – 18 November 2022 in Sharm El-Sheikh, Egypt

Terra Praxis hosted and participated in more than a dozen events over the two-week period of the United Nations Climate Change Conference (COP27) where we mainstreamed decarbonizing coal plants as a key accelerant to a clean and equitable energy transition.

Terra Praxis launched our EVALUATE application, announced partnerships with Schneider Electric and Terrestrial Energy, and secured new working relationships with organizations around the globe. Terra Praxis met with numerous utilities, investors, heat source vendors, national delegations, and NGOs who are committed to working with us to repower coal plants with clean energy.

Speaker panel. Stage left to right: Shannon Bragg-Sittou, Idaho National Laboratory; Kirsty Gogan, Terra Praxis; Michel Berthelemy, OECD Nuclear Energy Agency; Carlos Leipner-Gomes, Clean Air Task Force; at the Global Clean Energy Action Forum (CEM13). (Terra Praxis, 2022).

Eric Ingersoll, Terra Praxis & Conor Kelly, Sustainability Technology Lead, Microsoft, presenting REPOWER at the Microsoft pavilion at COP27. (Terra Praxis, 2022).



“We need a paradigm shift in the nuclear sector. Not only in the technologies, but in the business model, policy frameworks, and regulatory thinking. We need inspiration from other sectors — the Terra Praxis-led REPOWER Consortium is bringing this...”

— Diane Cameron,
OECD Nuclear Energy Agency (NEA), Head of the Nuclear
Technology Development & Economics Division

TEDxBOSTON

13 – 14 November 2022 in Boston, Massachusetts, US

Terra Praxis Chief Development Officer, Megan Pulliam, was honored to present the Terra Praxis REPOWER initiative for the TEDxBoston inaugural Planetary Stewardship event. Megan shared how repowering 2,400 coal plants with clean energy by 2050 is the single largest carbon reduction opportunity on the planet and critical to accelerating a clean and equitable energy transition. Watch her [TED Talk here](#).

ENLIT EUROPE

29 November – 1 December 2022 in Frankfurt, Germany

Terra Praxis chaired and participated in multiple sessions at Enlit Europe, Europe’s largest energy conference. Sessions examined how Europe’s energy crunch is prompting a re-evaluation of nuclear energy’s role in the decarbonization efforts in some countries, further encouraged by new technologies like SMRs and fusion. Sessions shared emerging best practices for re-using existing power plants to reduce carbon emissions.

Kirsty and Eric have been invited to the Enlit Advisory Board that is designing the key themes of the upcoming 2023 Enlit conference in Paris.

Pamela Largue,
Power Engineering
International, Senior
Reporter, interviewing
Kirsty Gogan (on nuclear
energy’s role in the
decarbonization efforts)
at Enlit Europe. (Terra
Praxis, 2022).

Megan Pulliam
talking about Terra
Praxis REPOWER at
TEDxBoston, Planetary
Stewardship.
(TEDxBoston, 2022).

IN THE NEWS

Terra Praxis insights were sought and featured in editorials by 50 worldwide news and media outlets — shining a light on our climate solutions. In addition, our press releases were picked up by the global media and translated into eight languages.

Here are some highlights of Terra Praxis' news features.
To see a full list of our 2022 news, please [visit our website](#).

01

01.25.22

“... a fast, repeatable system resulting in carbon negative power plants that are cheaper to operate... and ensure continuity for communities...”

Digital Platform Launched for Repowering Coal Plants
— World Nuclear News (WNN)

“This ambitious project will design a process to repower the world’s coal fleets via a fast, repeatable system resulting in carbon negative power plants that are cheaper to operate than before and ensure continuity for communities reliant on these plants for energy and jobs.”

— Eric Ingersoll, Terra Praxis Founding Director & Co-CEO



03

03.01.22

“... accelerate and de-risk global decarbonization.”

Repowering Provides New Purposes for Existing Plants
— POWER Magazine

“‘Coal plants vary widely and developing a new design for each plant would be complex, costly, and slow,’ said Martin Wood, co-founder of Bryden Wood. ‘Rather than thousands of individual projects, we must have a unified approach where the design is simplified and standardized to make this plan a reality as quickly as possible. The plan is to replace the existing boiler with a standardized advanced heat source (AHS) that fits into a standardized facility.’ ...Kirsty Gogan said repowering is a way ‘to accelerate and de-risk global decarbonization,’ while also supporting an ‘affordable clean energy provision on existing sites utilizing existing transmission.’ She said it provides ‘the opportunity to reduce the overall scale of investment required to enable the clean energy transition.’”

— Darrell Proctor, POWER Magazine Senior Associate Editor

03.29.22

“... cleaning up all of our fossil fuel based energy infrastructure...”

The Future of Nuclear Power in Britain, and BA to Use Sustainable Jet Fuel — Sky News: The Daily Climate Show

“We have to look at any of these risks in context and right now the reality is that we see 7 million premature deaths per year around the world from air pollution. So focusing on this and cleaning up all of our fossil fuel based energy infrastructure is really an incredible opportunity not only to address the climate challenges we face but also the public health challenges we face.”

— Kirsty Gogan, Terra Praxis Founding Director & Co-CEO



10

10.17.22

“... one that caught my attention: Terra Praxis which is a strategic collaboration to decarbonize coal.”

Interview with Microsoft Vice Chair & President Brad Smith
— CNN: First Move

“Technology is a crucial aspect of (the clean energy transition) and I know you spent a lot of time talking about how technology can facilitate that transition. I lose track of the number of partnerships you sign, but one that caught my attention: Terra Praxis which is a strategic collaboration to decarbonize coal, and... take a fleet of 2,400 coal plants and get them to run on clean energy. I love this idea of investing in renewables, but also transitioning some of the dirtier forms of electricity production... making them cleaner.”
— Julia Chatterly, CNN Anchor & Correspondent

11

11.03.22

“... a great example of the innovation the world will need to create a sustainable future.”

Terra Praxis Will Launch the First of its Applications to Help Coal Plants Decarbonize at COP27

— AP News (and 1000+ other global news and media outlets)

“The world needs more energy, not less... To reach net zero, we must come together and develop new sustainable power sources, as well as transform what already exists. Terra Praxis’ solution to transform coal-fired power plants into carbon-free energy sources is a great example of the innovation the world will need to create a sustainable future.”
— Brad Smith, Microsoft Vice Chair & President

11.18.22

“Our focus is to develop a standardized, scalable system...”

SMRs Seen Playing Key Role in Repurposing Coal Plants
— Reuters Events

“Our focus is to develop a standardized, scalable system, with a view to configuring the design to be able to meet any kind of site or plant requirements while also accommodating a range of different heat sources that are being commercialized today... Automated design, seismic isolation, pre-fabrication of components, standardization of supporting systems across multiple heat source vendors, and a ‘universal adaptor’ heat transfer and storage system are some of the key components...”
— Chirayu Batra, Terra Praxis Chief Technology Officer

11.29.22

“... innovative ways to meet the globe’s growing energy needs...”

Want to Fight Climate Change Effectively? Here’s Where to Donate Your Money
— VOX

“Terra Praxis is a nascent UK-based nonprofit aiming to find innovative ways to meet the globe’s growing energy needs, with a special focus on advanced nuclear power, which is neglected in the climate funding landscape. The data shows that nuclear power is safer than you might think. It’s a clean energy source that’s already been scaled up fast to decarbonize electricity systems in countries like Sweden and France; going forward, it could help ensure that people in developing countries have enough energy to meet their needs.”
— Sigal Samuel, VOX Senior Reporter



OUR FINANCIALS

6

By developing catalytic strategies, we can generate powerful multiplier effects, maximizing impact of the resources we receive from our donors.

“We know we are winning against climate change if carbon emissions decline, and the more the better. Each of us can encourage clean-tech innovation through political advocacy or by funding or working for effective nonprofits like Clean Air Task Force or Terra Praxis.”

— William MacAskill,
Author of *What We Owe the Future*

2022 FINANCIAL STATEMENT

2022 Terra Praxis Profit and Loss (Unaudited)

January – December 2022

INCOME	
Program Revenue	\$110,000
Donations	\$1,524,318
Grants	\$922,421
Total Income	\$2,556,739
EXPENSES	
Communications & Marketing	\$123,530
Staff & Benefits	\$694,342
Technical Experts & Consultants	\$144,783
Travel & Event Expenses	\$68,777
Legal & Professional Fees	\$36,668
Administrative	\$38,202
Total Expenses	\$1,106,302
NET	\$1,450,437

The UK-based sister organization, Terra Praxis CIC, files separate financial reports in the UK.

HOW WE ARE FUNDED

Each year Terra Praxis is supported by hundreds of donors who enable our high-impact work to dramatically reduce the risks of catastrophic climate change in this century.

Our donors recognize that we have “a compelling vision that pushes the envelope on the issue of combating climate change while remaining firmly grounded in real-world realities of geopolitical and economic viability. Coupled with an experienced team, institutional support from the likes of Microsoft, and buy-in from the right stakeholders” that we possess “what it takes to create tangible and lasting impact.”

— Shawn Low & Elizabeth Mak, Terra Praxis Donors

Philanthropic support is vital to our mission and impact. In our second year, Terra Praxis was funded by over 475 gifts of all sizes, demonstrating significant grassroots support for our work.

Connect with us today at philanthropy@terrapraxis.org to discuss how you can help fuel our clean energy future.

If we are to act like it is a climate emergency — a massive reimagination of our global energy system is needed.

Your support empowers people and protects nature by advancing clean energy solutions for unsolved climate challenges.

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London, UK

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