

2021
ANNUAL REVIEW

ENERGY INNOVATION FOR A LIVABLE PLANET

TERRA
PRAXIS

1

Our first year of thought leadership has contributed to a permanent change in both the perceptions of, and potential solutions to, the climate problem.

OUR FIRST YEAR IN REVIEW

Participated in **64 events** that connected **12,000+ people** across **175 countries**.

Met with **25 government entities** and **global bodies**.

Held **workshops** with **19** potential industry partners.

Invited to give **5 keynote presentations** and to moderate **8 sessions**.

TERRAPRAXIS
FEATURED IN
HUFFINGTON POST,
THE NEW YORK TIMES,
BLOOMBERG, VOX,
AND REUTERS

Featured in **60+** leading global and national **media outlets**.

Published **12 articles** and **reports**.

Sent **800 tweets** receiving **1,726,300 impressions**.

Uploaded content receiving **2,687 views** on YouTube.

CONTENTS

1 / Our First Year in Review	02
Year in Numbers	
A Message From Our Founders	
2 / Our Approach	04
3 / Our High-Impact Programs	05
Flagship Programs	
Future Program Areas	
4 / Program Highlight 1	08
Repowering Coal Overview	
Accomplishments	
5 / Program Highlight 2	10
Clean Synthetic Fuels Overview	
Accomplishments	
6 / On a Global Stage	12
CEM12	
COP26	
7 / In the News	15
8 / Our Team & Financials	17

A MESSAGE FROM OUR FOUNDERS

Dear friend,

Global carbon emissions continue to rise each year, driven by demand for fossil fuels, despite decades of public and political support for action on climate and large-scale deployment of renewable energy.

At the same time, 13% of the world population lack access to modern electricity to power their lives, which hurts the health and economic mobility of women and children most.

TerraPraxis was born out of the realization that a massive reimagination of our global energy system is needed to protect our planet and grow human prosperity, particularly for the difficult-to-decarbonize sectors of industrial heat, coal, and heavy transport.

The Paris Agreement states that emissions need to be reduced by 45% by 2030 and reach Net Zero by 2050 to limit global warming to 1.5°C. **As of this writing, the world is far off track of the Paris Agreement goal, with 2°C global warming likely by mid-century.**

If we miss the 1.5°C target, this means accepting climate impacts such as 10 million more people displaced by sea level rise, 65 million more people exposed to exceptional heatwaves, a doubling of biodiversity related impacts such as species loss, the elimination of Arctic Ocean sea ice, and the loss of virtually all coral reefs.

If we miss the 2°C target, half the world's population would be exposed to summertime 'deadly heat,' Greenland and the West Antarctic ice sheets would collapse, droughts would increase by 500%, and the Sahara Desert would begin to expand into southern Europe. World food supplies would be imperiled, driving major refugee flows and a growing risk of civilizational collapse.

The world can still achieve Net Zero by 2050 if innovative climate solutions are pursued at speed and scale.

The COVID-19 pandemic is evidence that we can choose how we respond to crises. By treating the COVID-19 pandemic like an emergency, we were able to collapse vaccine development from 10 years to 10 months. Now we must start acting like we are truly in a climate emergency.

We know that climate change is an energy problem. Now we have 28 years to replace fossil fuels and double our overall energy supply.

As you reflect on our first year, we hope you will be as energized as we are by our success in mobilizing a broad coalition of public and private sector leaders and building momentum for innovative climate solutions (for coal plant conversion, flexible co-generation, clean hydrogen, and synthetic fuels production).

We thank you for being part of our growing TerraPraxis family and for entrusting us with this vital work building scalable market-based solutions to address the climate crisis. From everyone at TerraPraxis, we deeply appreciate your belief in our mission.

With gratitude,

Kirsty Gogan & Eric Ingersoll

TerraPraxis Co-Founders

**TERRAPRAXIS IS A
CLIMATE SOLUTION
INCUBATOR FOR KEY
NEGLECTED AREAS
OF THE CLIMATE
CHALLENGE**



▲ Rafael Grossi, IAEA Director General met with Kirsty Gogan and Eric Ingersoll during the IAEA 64th General Conference.

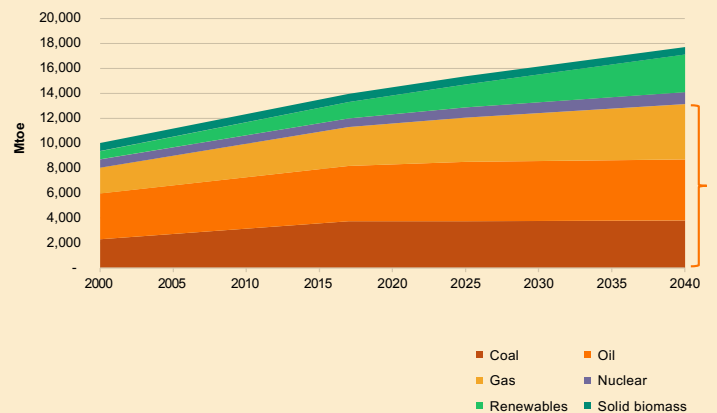
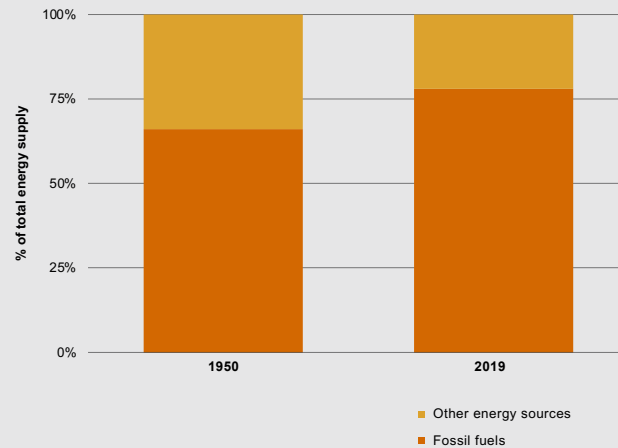
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Climate change is an energy problem. We believe a massive re-imagination of our global energy system is necessary to protect our planet and grow human prosperity.

TERRAPRAXIS
FEATURED IN VOX AS
ONE OF THE SEVEN
MOST HIGH-IMPACT,
COST-EFFECTIVE,
EVIDENCE-BASED
ORGANIZATIONS
FIGHTING CLIMATE
CHANGE

^ World Energy by Source 1950 vs. 2019. (Our World in Data, 2017 and BP Statistical Review of World Energy, 2022).
> IEA's Stated Policies Scenario: World Energy by Source. (International Energy Agency, 2019).

OUR APPROACH: URGENCY & SCALE



THE CHALLENGE

Fossil fuels will continue to make up the vast majority of world energy use by mid-century, putting people and our planet on a trajectory to experience deadly climate impacts, unless we develop alternatives that compete on price and performance.

We believe that when the true challenges of achieving a clean, affordable, and reliable energy transition by 2050 start to bite, the more necessary zero-carbon advanced heat sources (advanced fission, fusion, or super-hot rock geothermal) will be to protect the planet and save humanity. TerraPraxis has been anticipating this demand and has been designing transformative solutions to achieve the urgency, scale, and low costs required.

WHAT WE DO

We accelerate solutions for neglected areas of the climate challenge—particularly the difficult-to-decarbonize sectors of industrial heat, coal, and heavy transport—in order to reduce climate suffering and increase access to clean, affordable, and reliable energy.

To reduce the catastrophic risks to people and the planet of failing to achieve Net Zero by 2050, we:

- 1 Define** the political, social, and technical risks and challenges to reducing global carbon emissions, and **advocate** for these risks and challenges to be accurately reflected in solutions, climate models, and policy.
- 2 Design and incubate** scalable market solutions by turning risks and challenges into design requirements and criteria to accelerate decarbonization and expand access to clean energy without relying on individual behavior change.
- 3 Mobilize broad coalitions** of public and private sector global leaders to build momentum and demand for these new solutions (for coal plant conversion, flexible co-generation, clean hydrogen, and synthetic fuels production) so that these solutions take on a life of their own.

3

Our programs could accelerate the reduction of global carbon emissions by repurposing trillions of dollars of existing infrastructure to supply clean, affordable, and reliable energy to billions of people.

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

> Production platform for hydrogen, power, ammonia, and desalination moored near shore. (LucidCatalyst, 2020).

OUR HIGH-IMPACT PROGRAMS



FLAGSHIP PROGRAMS

REPOWERING COAL

Coal plants are the single largest source of carbon emissions on the planet, but simply shutting them down is not a viable worldwide solution because it would be devastating to local economies and is unrealistic practically, economically, and politically— even more so during the current global energy crisis. A key to de-risk our energy transition is to repurpose as much existing infrastructure as possible, including coal plants and their existing transmission.

TerraPraxis is leading a world-class consortium in developing the standardized physical system designs and project delivery tools for coal plant owners to rapidly repower the world's 2TWe of coal plants with carbon-free advanced heat sources, such as advanced fission, fusion, or super-hot rock geothermal.

CLEAN SYNTHETIC FUELS

The world can still meet the Paris goals of 1.5–2°C if sufficient, low-cost, clean hydrogen is produced to replace oil and gas in shipping, aviation and industry, according to a major new report, co-authored by TerraPraxis: [Missing Link to a Livable Climate: How Hydrogen-Enabled Synthetic Fuels Can Help Deliver the Paris Goals](#).

TerraPraxis' report introduces an innovative climate solution for how new shipyard manufacturing approaches can produce abundant clean hydrogen-based synthetic fuels at prices that can outcompete fossil fuels within 10 years, and at a scale that can displace the 100 million barrels of oil that are currently consumed around the world each day.

FUTURE PROGRAM AREAS

In 2022, we will add the following program areas:

CARBON CAPTURE

TerraPraxis designs climate solutions that can achieve global scale without imposing substantial cost burdens, or requiring significant investments in new infrastructure. Data and analysis by the Intergovernmental Panel on Climate Change (IPCC) show an alarming carbon emissions trajectory. Carbon emissions reduction is no longer sufficient for climate change mitigation: “all credible pathways depend on negative emissions.”

Large-scale atmospheric carbon removal is required, but the current high cost is a barrier to the rapid deployment of direct air capture and other technologies. Current mainstream cost estimates for atmospheric carbon dioxide removal range from \$90 to \$600/tonne.

TerraPraxis is grateful for funding from the Anthropocene Institute for the production of a short report describing a large-scale and low-cost approach to atmospheric carbon removal using the air circulation in existing cooling towers at zero-emission thermal plants. This approach has the added benefit of producing hydrogen as part of the process, which can generate both revenue to offset the carbon removal process, as well as contribute towards larger decarbonization goals as an end use fuel, or as a feedstock for zero-carbon synthetic fuels.

Our analysis shows that a typical nuclear plant would have capture rates of between 300,000 and 500,000 tonnes of CO₂ per year, turning them into carbon-negative generators. We estimate that around half of the existing global nuclear fleet has suitable cooling towers, which could enable global capture of up to 100 million tonnes of CO₂ per year. We estimate that costs of less than \$50/tonne can be achieved — low enough to be within the trading band of carbon credits today. In addition to existing nuclear plants, we highlight the opportunity to retrofit cooling towers at repowered coal plants. This additional ‘repowered’ fleet could achieve capture rates of 1 to 2 gigatonnes of carbon per year. Significantly more capture is possible if the cooling tower based capture approach were to be applied, beyond power plants, to other industrial facilities, such as steel plants.

Existing cooling tower infrastructure is currently in danger of being demolished. Policy makers, government officials, climate advocates, and power plant owners may wish to consider the climate benefits and economic value of reusing existing infrastructure before those demolition plans needlessly destroy what could be a powerful tool in confronting the climate crisis.

DE-RISKING THE ENERGY TRANSITION

The sequencing and time-sensitivity of this massive, simultaneous infrastructure buildout in every country presents an unprecedented logistical challenge. The challenge is not only to build enough clean electricity generation infrastructure, but to build the infrastructure needed to electrify other sectors such as industrial heat and heavy transport. If we restrict our options (e.g., to only renewables) we dramatically increase the risks to people and our planet of failing to decarbonize in time. Each of the zero-carbon energy technologies have advantages and risks/challenges to their large-scale deployment.

The principal major risks to the energy transition tend to increase with deployment and include: land availability, transmission build, public support/opposition, and project risk. We note that many potential wind and solar projects do not make it through the project development phase due to political, social, and technical constraints around the extensive land required, impact on landowners and communities, and massive new transmission build needed. This means to commission a gigawatt of solar several gigawatts must make it to late stage development status. This will necessarily require more developers overall, more development capital, and more human resources dedicated to other parts of the process (e.g., permitting, interconnection studies, engineers, financiers, etc.).

A way to reduce the risk of failing to decarbonize is to have a portfolio of solutions which do not all share the same risks. For example, complementing a renewables strategy by repowering existing power plant sites with advanced heat sources would enable large clean energy capacity additions without requiring greenfield project development or new transmission lines.

“With these technologies now maturing, the next horizon is about their deployment, which is really a bridge to bankability for nuclear... we need a phased approach to the deployment of new nuclear that prioritizes speed to market.”

— Jigar Shah, Director of the Loan Programs Office at U.S. Department of Energy

**TERRAPRAXIS DESIGNS
AND DELIVERS
TRANSFORMATIVE
CLIMATE SOLUTIONS
WITH ENVIRONMENTAL
JUSTICE AT THE HEART**

TerraPraxis is leading a deep engagement with other NGOs, policy makers, political leaders, and energy systems modelers to de-risk the energy transition by shining a light on these risks to ensure they are fully represented in decarbonization pathways.

TRANSFORMING MODELING

Energy models, upon which all energy transition targets are based, compare the types of generation capacity that we need to deploy by mid-century. These models offer guidance on the scale of the energy infrastructure needed. However, nearly all energy models are optimized on generation cost alone. This means that if a renewables strategy alone is just a few dollars per MWh cheaper, the models recommend decarbonization with mostly renewables. Most models do not yet consider other factors, particularly those related to deployment feasibility (reflecting various socio-political, cultural, commercial, and financial factors). This creates a widening gap between energy models and the real world of project development. The problem is that policymakers assume that what the energy models are telling them is feasible. Consequently, policy targets are not tied to real world challenges and time-sensitive infrastructure implementation plans are not risk-informed.

In our 'Transforming Modeling' work, we are developing a "Data Book" to support global modeling organizations to represent deployment feasibility as well as cost in Net Zero pathways. TerraPraxis has deep experience and expertise in project delivery risks and constraints related to land use, transmission, and supply chain requirements that can impact the costs, speed and scale of development. We are now developing new methodologies to represent these risks and constraints in modeling to enable a more realistic picture for investors and policy makers of what is feasible on the path to Net Zero.



**“Nuclear energy
is a critical climate
solution.”**

— Ambassador Bonnie Denise
Jenkins, U.S. Department of State

Images / quotes from the TerraPraxis'
'Energy Day' at the CASC during COP26.

^ Kim Stanley Robinson, renowned
author and keynote speaker. (Photography:
TerraPraxis © Julie Broadfoot).

^ Ambassador Bonnie Denise Jenkins
speaking.

4

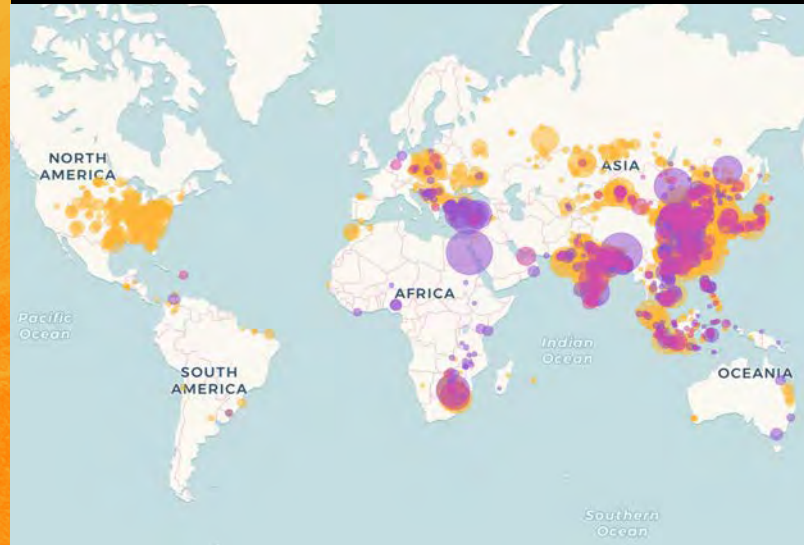
We are building and priming the Repowering Coal marketplace to enable the mass deployment of Repowering Coal projects globally between 2025 to 2050.

**REPOWERING COAL
RECOGNIZED AS
THE LARGEST
CARBON ABATEMENT
OPPORTUNITY
ON THE PLANET
WITH PROFOUND
EFFECTS ON HUMAN
PROSPERITY**

^ Global mapping of coal plants operating (yellow), under construction (pink) and planned (purple). (Carbon Brief, 2022).
> Coal plant showing how it could be repowered with small modular reactors. (TerraPraxis, 2022).

PROGRAM HIGHLIGHT

1/ REPOWERING ALL COAL PLANTS WITH CLEAN ENERGY BY 2050



TerraPraxis' Repowering Coal solution is increasingly being recognized as the most practical way to achieve this global repowering and greatly accelerate the clean energy transition. Support across the political spectrum is growing worldwide with critical public and private sector leaders determined to seize this opportunity.

Repowering existing coal plant infrastructure by replacing coal boilers with new advanced heat sources (such as small modular reactors, fusion reactors, or super-hot rock geothermal) offers a fast, low-risk path to decarbonizing global power generation. This would also enable a just and efficient transition by sustaining the jobs and community tax revenues associated with existing coal plants; providing social, economic, and environmental benefits associated with continued reliable and flexible electricity generation; and continuing to use existing transmission lines—without emissions.

The U.S. Department of Energy plans to invest \$2 billion in building an advanced heat source near a coal plant in Wyoming. While this is a welcome step, the U.S. and other countries need a much faster, lower-risk, lower-cost, and repeatable strategy for repowering all coal plants to sustain jobs, to re-purpose flexible generating infrastructure, and to reuse existing transmission.

TerraPraxis has identified that for the repowering of up to 7,000 coal plant units worldwide to occur between 2025 and 2050 (average rate of 280 per year) coal plant owners and institutional investors require tools to achieve rapid, repeatable, and reliable project assessments and delivery. We have assembled a world-class team (including Bryden Wood, MIT, and the University at Buffalo) and a Customer Advisory Group (including some of the largest utilities in the world) in the development of standardized building system designs and automated delivery applications that will dramatically reduce regulatory licensing scope, project duration, project costs, and construction risks.

We are combining proven innovations in other sectors—principally seismic isolation, building modules, design automation, rapid engineering software, and big data analysis—into a single REPOWER platform to transform the delivery of advanced heat sources. The platform will enable all key participants in the project to interact more efficiently—including coal plant owners, institutional investors, regulators, designers, suppliers, advanced heat source vendors, assemblers, and nuclear service providers.

ACCOMPLISHMENTS

In our first year, TerraPraxis has delivered the following achievements:

Won the Microsoft 2021 Hackathon Executive Challenge – Sustainability Category, with our design of a global coal database and basic Repowering Coal platform. The 'Beyond Coal' Hackathon team, consisting of both TerraPraxis and Microsoft employees, was chosen as the Hackathon Executive Challenge winner by Microsoft President & Vice Chairman, Brad Smith.

Recognized as a world thought leader in Repowering Coal, bringing it to the forefront of global conversations around energy and climate at COP26, CEM12, and CleanTech Forum Europe, where Repowering Coal received endorsements from influential world leaders, including international government officials, policy makers, regulators, utility providers, and other key stakeholders. See below for event highlights.

Influenced government funding for Repowering Coal with Jigar Shah, Director of the Loan Programs Office at the U.S. Department of Energy signaling \$11 Billion in loan financing to repower existing coal infrastructure with advanced heat sources to accelerate the transition away from fossil fuels.

Recruited a world class team, including strong partnerships with Bryden Wood, leveraging their track record on performance and economics of design and construction efforts on large, complex building projects (as measured by cost, risk, and schedule compression); the **University at Buffalo**, utilizing their demonstrated work on seismic isolation; **MIT**, bringing their leadership on nuclear engineering, heat transfer/exchange, and thermal energy storage; and **Microsoft**, bringing their expertise in software development and global market reach.

Developing a Customer Advisory Group, including some of the largest utilities in the world.

Actively developing the first application in our REPOWER platform suite. The customer driven EVALUATE tool is currently under development by Microsoft with direction from TerraPraxis and Bryden Wood. This application will be tested and iterated with the Customer Advisory Group and rolled out as a free product for coal plant owners by the end of 2022, enabling hundreds of gigawatts of coal plants to be evaluated for repowering.

Influenced public support for Repowering Coal through media coverage from eight reputable news articles, including The New York Times, Huffington Post, The National News, Architects' Journal, and New Civil Engineer.

“With the right technology and regulatory innovation, Repowering Coal is likely one of the single biggest climate challenge technology opportunities available to humanity.”

—Conor Kelly, Microsoft Sustainability Technology Lead, Microsoft Cloud for Industry



^ Conor Kelly on LinkedIn.

^ The 'Beyond Coal' Hackathon Team, consisting of TerraPraxis and Microsoft employees. (TerraPraxis, 2022).

5

We are designing a system for delivering clean, low-cost hydrogen to replace oil and gas in shipping, aviation, and heavy industry.

CLEAN SYNTHETIC FUELS **RECOGNIZED AS A SOLUTION FOR HARD-TO-DECARBONIZE SECTORS WITH THE POTENTIAL TO ENABLE THE WORLD TO ACHIEVE THE PARIS AGREEMENT GOALS**

△ Modular manufacturing of clean synthetic fuels production platforms based on state-of-the-art shipyard manufacturing. (LucidCatalyst, 2019).

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

PROGRAM HIGHLIGHT

2 / DE-RISKING THE CLEAN ENERGY TRANSITION WITH CLEAN SYNTHETIC FUELS



The Earth has warmed 1.2°C since industrial times and is on track to surpass the catastrophic 2°C threshold by 2050. The world can still meet the Paris Agreement goals of limiting the global temperature increase to 1.5 – 2°C if sufficient low-cost, clean hydrogen is produced to replace oil and gas in shipping, aviation, and industry. TerraPraxis describes a strategy to achieve this in a major new report: *Missing Link to a Livable Climate: How Hydrogen-Enabled Synthetic Fuels Can Help Deliver the Paris Goals* (published September 2020).

The amount of hydrogen required for the oil and gas energy transition is far more than can be produced with renewables alone. In the report, TerraPraxis describes how new deployment strategies for advanced heat sources via Gigafactories and offshore plants have the potential to produce and deliver hydrogen at the speed, scale, and costs (e.g. less than \$1/Kg) required to replace worldwide oil and gas consumption.

For example, just 10–12 Hydrogen/Synfuel Gigafactories would replace all of the UK's natural gas consumption. Global rollout for hydrogen can also be accomplished with shipyard-manufactured, sea-going, production platforms akin to the large offshore vessels currently used by the oil industry. Hundreds of these production platforms can be manufactured each year using existing spare shipyard capacity, delivering low-cost, high-volume H₂ production facilities to industrial centers.

After publishing the report, TerraPraxis supported the global roll-out, including translation into multiple languages, including Korean, Chinese, and Japanese. Throughout 2021, TerraPraxis communicated with identified audiences around the world to bring these concepts and opportunities into the mainstream. This was a highly successful endeavor leading to numerous published articles and broadcast events promoting these concepts, and widespread adoption and pursuit of these opportunities by governments, large liquid fuels users in the shipping and aviation industries, major oil producers and policy makers and NGOs from across the United States and Canada, Europe, Japan, and Korea. Discussion of hydrogen produced with advanced heat was almost completely absent from the mainstream discourse in 2020. TerraPraxis' effective thought leadership in 2021 achieved a permanent change in how policymakers and industry leaders perceive the oil and gas problem and the solutions available.

ACCOMPLISHMENTS

In our first year, TerraPraxis has delivered the following achievements:

Launched our Clean Synthetic Fuels solution through our published report ‘Missing Link to a Livable Climate’, which shows how existing industrial capabilities in the oil and gas sectors, combined with a new generation of advanced heat sources, can be re-deployed to fully and cost-competitively decarbonize aviation, shipping, cement, and other industries by mid-century. This report shows how advanced heat sources manufactured in high productivity environments, could deliver hydrogen on a large scale for \$1.10/kg, with further cost reductions at scale reaching \$0.90/kg by 2030, making it a cost competitive alternative to oil. These advanced heat sources can be built rapidly and at the required scale using a “Gigafactory” approach to modular construction and manufacturing, or in existing world-class shipyards. To replace 100 million barrels of oil per day equivalent requires an investment of \$17 trillion, spent over 30 years from 2020 to 2050. This is lower than the \$25 trillion investment otherwise required to maintain such fossil fuels flows in future decades, and contrasts with a \$70 trillion investment for a similarly sized renewables-to-fuels strategy.

Recruited advocates for Clean Synthetic Fuels through 25 high-impact events with 7,000+ attendees worldwide, seven podcasts reaching over 100,000 people, and 23 news articles.

Translated Missing Link report into Japanese, Chinese, and Korean to recruit advocates and influence Clean Synthetic Fuel adoption in these countries. Broadened the Missing Link report reach through the creation of a widely disseminated short summary version. In 2022, TerraPraxis is planning to complete the translations into Finnish and Spanish, and to officially launch the report in China, Korea, and other countries.

Engaged as a strategic thought partner to many of the world’s major oil companies who are seeking our team’s advice on how to design a system for delivering clean-synthetic fuels.

“When I read the Missing Link report I thought for the first time, that it found an approach that could work...Thank you for bringing things forward that bring hope.”

— Seth Grae
President & CEO of Lightbridge Corporation



^ Seth Grae speaking at the CEM12 session on ‘Net Zero with Clean Fuels’, hosted by the NICE Future initiative.

^ Missing Link to a Livable Climate report and translations. (LucidCatalyst and TerraPraxis 2020 – 2021).

6

We are recruiting advocates, influencing public policy, and securing government funding for innovative climate solutions.

TERRAPRAXIS MADE REPOWERING COAL AND CLEAN SYNTHETIC FUELS KEY FOCUSES AT CEM12 AND COP26

▲ Eric Ingersoll interviews President & CEO Rumina Velshi of the Canadian Nuclear Safety Commission and Amy Roma, Partner, Hogan Lovells at TerraPraxis' 'Energy Day' at the CASC during COP26. Jigar Shah, Director, Loan Programs Office, United States Department of Energy joined the session remotely (on screen to right). (Photography: TerraPraxis © Julie Broadfoot).

> Rumina Velshi speaking at the CEM12 session on 'Net Zero with Clean Fuels', hosted by the NICE Future initiative.

ON A GLOBAL STAGE



“... I would like to applaud Kirsty Gogan and Eric Ingersoll on their work around flexible nuclear applications, including heating, hydrogen, and repowering coal plants, with small modular reactors. This kind of ingenuity serves as a reminder: regulators must always be ready... we need to know and understand what’s coming.”

— Rumina Velshi
President & CEO of the Canadian Nuclear Safety Commission

From webinars to global conferences, TerraPraxis participated in 64 events that connected 12,000+ people across different sectors, disciplines, and countries in conversation around Repowering Coal and Clean Synthetic Fuels as necessary steps towards combating climate change. We are pleased to share highlights of two of our high impact and profile-raising events below—CEM12 and COP26.

To read highlights from other events where TerraPraxis took the stage in 2021, please [visit our website](#).

12TH CLEAN ENERGY MINISTERIAL

TerraPraxis launched the Repowering Coal concept on a global stage at an event co-hosted with the NICE Future initiative at the 12th Clean Energy Ministerial (CEM12), hosted by Chile (30 May – 4 June, 2021). The discussion expanded on nuclear technology's system flexibility benefits, presenting new applications that target hard-to-decarbonize sectors and enable re-use of existing infrastructure without emissions, including the opportunity to repower coal fleets making them cleaner and more flexible.

TerraPraxis also co-hosted a session on “Net Zero with Clean Fuels” with the NICE Future initiative at CEM12. Even as clean electricity becomes more readily available worldwide, emissions are still projected to continue, and rise, in difficult to decarbonize sectors, such as industry, aviation, and shipping. This event explored opportunities to target these hard-to-abate sectors with advanced heat sources and hydrogen-enabled clean synthetic fuels to accelerate cost-effective transitions to zero emissions energy systems. [Kirsty Gogan presented the findings from the Missing Link report.](#)

Kirsty Gogan moderated a high level session “Net Zero Emission Pathways with Nuclear Innovation,” hosted by the NICE Future initiative with Director Generals from the International Atomic Energy Agency, OECD Nuclear Energy Agency, World Nuclear Association, and International Energy Agency Executive Director. During this session ministers and energy leaders discussed how flexibility and integration can maximize the full potential of clean, reliable, and affordable power systems enabling the transition towards countries' ambitious Net Zero goals.



“We are on the brink of another industrial revolution of clean energy. If you cannot embrace new technology, then you cannot be the leaders of tomorrow.”

— Mohamed Nasheed
Former Maldives President, current Speaker of Parliament & Ambassador for Ambition of the Climate Vulnerable Forum

“We can still solve the climate and energy problem and obtain a bright future for young people. It requires two actions, neither of which is receiving needed attention at this conference. The crucial underlying requirement is a rising price on carbon to make the fossil fuel price honest. And, secondly, there must be technology support for research development and demonstration, and that includes nuclear power.”

— Jim Hansen
Climate Scientist



Images / quotes from the TerraPraxis' 'Energy Day' at the CASC during COP26.
(Photography: TerraPraxis © Julie Broadfoot).

▲ Kirsty Gogan interviews H.E. Mohamed Nasheed, Speaker of Parliament, The Republic of Maldives and Jerome Foster II, Climate Advisor, White House Environmental Justice Advisory Council.

▲ Kirsty Gogan and Rafael Grossi, IAEA Director General.

“Carbon neutral air travel is vital to keeping the global economy moving and connecting people while progressing toward Net Zero.”

—Eric Ingersoll
Co-Founder & Managing Director
of TerraPraxis



Excited to be talking with @TerraPraxis and the @AtlanticCouncil today about how the LPO can leverage our \$11B to help the #nuclear industry build “Airplanes not Airports” to reduce costs and deploy faster to replace retiring coal/NG plants in this decade.

^ Eric Ingersoll statement on COP26 Transport Day and Deployment of Clean Synthetic Fuels.

Images / quotes from the TerraPraxis’ ‘Energy Day’ at the CASC during COP26. (Photography: TerraPraxis © Julie Broadfoot).

> Speaker panel. Stage left to right: H.E. Mohamed Al Hammadi, Managing Director & Chief Executive Officer, Emirates Nuclear Energy Corporation; H. E. Aminath Shauna, Cabinet Minister of Environment & Climate Change, Maldives Government; Dr Sama Bilbao y León, Director General, World Nuclear Association; Eng. Andrew N. Kamau, Principal Secretary, State Department of Petroleum, Kenya. Screen left to right: Jens BØRDARSON, Chief Operating Officer, Icelandair; Dr Dirk Smit, Chief Scientist, Shell.

^ Jigar Shah, Director of the Loan Programs Office at the U.S. Department of Energy on Twitter (signaling \$11 billion in loan financing to repower existing coal infrastructure with advanced nuclear reactors to accelerate the transition away from fossil fuels).

“Biden-Harris administration maintains the United States’ decades-long commitment to advancing nuclear energy which is a critical enabler for a climate solution for many countries.

Nuclear energy is the right solution at the right time. It can not only address climate change, but also help countries meet their economic development and energy security goals. Further, nuclear energy can play a critical role in decarbonizing hard to abate sectors beyond electricity.”

— Ambassador Bonnie Denise Jenkins
U.S. Department of State

COP26

TerraPraxis hosted a full-day conference for 75 people in parallel with the UN Climate Change Conference (COP26).

During the event, TerraPraxis convened eminent speakers representing diverse perspectives in the global decarbonization challenge, including policy makers (US Department of Energy Director of Loan Programs Office; Climate Minister of the Maldives; State Department of Petroleum, Kenya), corporate partners (Co-Founder and Board Director, Bryden Wood; Director of Sustainability, Microsoft Azure; Partner, Hogan Lovells), political leaders (former president of the Maldives; White House Environmental Justice Advisor), INGOs (Director General of the International Atomic Energy Agency; Director General of the World Nuclear Association), regulators (President and CEO of the Canadian Nuclear Safety Commission), and energy providers (Chief Scientist at Shell; Managing Director and Chief Executive Officer, Emirates Nuclear Energy Corporation), energy customers (COO of IcelandAir), and NGOs (Executive Director, Clean Air Task Force; Chair of Steering Committee, Innovation for Cool Earth Forum; President, African Women in Energy and Power).

Speakers announced strategies to accelerate the affordable repowering of 2TW of coal and delivery of 100 million barrels/day of carbon-neutral liquid fuels, with the potential to repurpose trillions of dollars of existing infrastructure to continue supplying reliable energy, without emissions.

7

We are growing public support and political will for innovative climate solutions.

IN THE NEWS

“We believe that TerraPraxis continues to do incredibly important work around shaping a conversation for advanced nuclear to address critical decarbonization challenges...”

— Johannes Ackva & Luisa Sandkühler
Founders Pledge, quoted in Vox

“We need Impossible burgers for energy, a drop-in substitute. We’re not bending the curve on emissions because in the power sector we still need reliability, making the idea that we’re going to phase out coal unforgivably unrealistic right now.”

— Kirsty Gogan
Co-Founder & Managing Director of TerraPraxis,
quoted in Huffington Post

Throughout 2021, TerraPraxis’ insights and resources were sought and featured in over 40 leading global and national media outlets, enabling us to grow public support and political will for Repowering Coal and Clean Synthetic Fuels as necessary steps towards combating climate change.

We are pleased to share highlights of five TerraPraxis features below. To see a full list of TerraPraxis news features in 2021, please [visit our website](#).

VOX

November 30, 2021

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

Johannes Ackva and Luisa Sandkühler of Founders Pledge recommend TerraPraxis among seven of the most high-impact, cost-effective, evidence-based organizations fighting climate change:

“We believe that TerraPraxis continues to do incredibly important work around shaping a conversation for advanced nuclear to address critical decarbonization challenges, such as the decarbonization of hard-to-decarbonize sectors and the conundrum of how to deal with lots of very new coal plants that are unlikely to be prematurely retired.”

THE NEW YORK TIMES

November 1, 2021

G20 Updates: Climate Talks Dominate Summit’s Final Day

Mohamed Nasheed, a former prime minister of the Maldives who now leads a group of countries called the Climate Vulnerable Forum, singled out the G20’s failure to be more ambitious about phasing out coal.

“This is a welcome start,” Mr. Nasheed said in an emailed statement. “But it won’t stop the climate from heating more than 1.5 degrees and devastating large parts of the world, including the Maldives. G20 countries need to look at decommissioning coal plants at home and repowering their coal fleet infrastructure with clean energy.”

> Johannes Ackva and Luisa Sandkühler (Founders Pledge), VOX, ‘Want to Fight Climate Change Effectively? Here’s Where to Donate Your Money’, November 30, 2021.

✓ Kirsty Gogan (TerraPraxis), Huffington Post, ‘Are We at The Dawn of a Nuclear Energy Renaissance?’, November 29, 2021.

✓ Featured media outlets’ logos.

Vox  REUTERS

Bloomberg

THE
HUFFINGTON
POST

The New York Times

HUFFINGTON POST

November 29, 2021

Are We at The Dawn of a Nuclear Energy Renaissance?

Kirsty Gogan, co-founder of TerraPraxis is quoted:

"There have been years of indecisiveness, but the climate is changing around nuclear"... "We need Impossible burgers for energy, a drop-in substitute. We're not bending the curve on emissions because in the power sector we still need reliability, making the idea that we're going to phase out coal unforgivably unrealistic right now."

BLOOMBERG

July 31, 2021

Hydrogen Goes Nuclear as U.K. Reactor Pivots Toward Renewables

The U.K. has set a target for 5 gigawatts of hydrogen production by 2030, envisioning its use in road transportation, home heating, and ship propulsion. EDF currently runs 27 plants in the U.K. and France and is building two more; Sizewell C would be its 30th.

"The nuclear industry does need to broaden its ambition and recognize the value of these opportunities," said Kirsty Gogan, member of a government nuclear advisory board [and co-founder of TerraPraxis]. "We have started to see this happening."

REUTERS

October 5, 2021

Nuclear Seen Keeping Costs Down for 'Green' Hydrogen

Reuters cites a new study by Aurora Energy Research, Decarbonizing Hydrogen in a Net Zero Economy, which was commissioned by Urenco and has been supported by the International Atomic Energy Agency, EDF, LucidCatalyst, and TerraPraxis. Hydrogen is increasingly seen as an essential fuel to power a future, carbon-free economy. Nuclear power operators can mitigate high costs by fitting plants to produce hydrogen, and studies have found that the cheapest option for the growing hydrogen economy is to include nuclear in the energy mix.

"The nuclear industry does need to broaden its ambition and recognize the value of these opportunities."

— Kirsty Gogan
Co-Founder & Managing
Director of TerraPraxis, quoted
in Bloomberg

TERRAPRAXIS SOUGHT
OUT AS A THOUGHT
LEADER ON CLIMATE

8

We are powered by philanthropy and continue to grow our innovative team.

OUR TEAM & FINANCIALS



2021 TerraPraxis Profit and Loss (Combined)

INCOME

Donations and Grants	£1,289,308
Event Sponsorship	£108,422
Total Income	£1,397,729

EXPENSES

Communications and Marketing	£6,109
Staff and Consultants	£927,183
Event Expenses	£207,816
Legal and Professional Fees	£19,117
Administrative	£4,253
Travelling Expenses	£17,322
Total Expenses	£1,181,801

NET	£215,928
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△ TerraPraxis team 2021–22. Left to right: Kirsty Gogan, Eric Ingersoll, John Herter, Justin Aborn, Miriam Aylward, Megan Pulliam, Chirayu Batra, Paul Hohenberger, Malisol Ohirko, Romana Vysatova, Ian Woodhouse and Rachel Bielajew.

> TerraPraxis 2021 Financials (UK£).

WHO WE ARE

Powered 100% by philanthropy, TerraPraxis is a non-profit organization that innovates and incubates scalable solutions for a livable planet and human prosperity.

Our Team

Kirsty Gogan, Co-Founder and Managing Director
Eric Ingersoll, Co-Founder and Managing Director

John Herter, Director of Projects
Justin Aborn, Chief Scientist
Miriam Aylward, Chief Operating Officer
Megan Pulliam, Chief Development Officer
Chirayu Batra, Chief Technology Officer
Paul Hohenberger, Director of Special Initiatives
Malisol Ohirko, Head of Events and Special Projects
Romana Vysatova, Production/Operations Manager
Ian Woodhouse, Program Associate
Rachel Bielajew, Program Associate

2021 FINANCIALS

TerraPraxis continues to build our organizational capacity and grow our global team thanks to financial support from key individuals and foundation donors in our first year of operations. As we look to the future, our philanthropic strategy will continue to focus on growing support for our mission from government, foundations, and individuals, as well as leveraging corporate partner in-kind donations to maximize our impact as a lean nonprofit.

**A massive reimagination
of our global energy system
is needed to address climate
change. Your support
protects our planet and
grows human prosperity
by accelerating solutions
for neglected areas of the
climate challenge.**

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London, UK

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