

# Net Green

FOUNDATION

## Time is ticking

Poised towards a Sustainable Future.





ON AVERAGE,

YOU TAKE

60,000 LITRES OF WATER

FROM THIS PLANET

IN YOUR LIFETIME.

HOW MUCH DO YOU GIVE BACK?

AT NET GREEN FOUNDATION, WE BELIEVE IN RESTORING BALANCE BY PROMOTING WATER CONSERVATION AND SUSTAINABLE PRACTICES. THROUGH INNOVATIVE SOLUTIONS AND COMMUNITY-DRIVEN ACTION, WE'RE WORKING TO GIVE BACK MORE THAN WE TAKE. JOIN US IN PROTECTING OUR PLANET'S MOST PRECIOUS RESOURCE—BECAUSE THE FUTURE DEPENDS ON WHAT WE DO TODAY.



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राव नरबीर सिंह  
Rao Narbir Singh



D.O. No. 16/07.03.2025

उद्योग एवं वाणिज्य, पर्यावरण, वन और  
वन्यजीव, विदेशी सहकारिता, सैनिक तथा  
अर्ध सैनिक कल्याण मंत्री, हरियाणा।

Industries & Commerce, Environment,  
Forests & Wild Life, Foreign Cooperation  
and Sainik & Ardh Sainik Welfare Minister,  
Haryana.

## Message

### Forward Message for Net Green Foundation Magazine

**Dear Readers,**

Haryana is a land rich in heritage and vibrant energy—a state where the spirit of progress harmonizes with a deep connection to the environment. Our fields, rivers, and bustling cities reflect a synergy that reminds us progress must come hand in hand with environmental stewardship. As we forge a path of industrial and economic development, we are equally committed to protecting and enriching our natural heritage. I am pleased to present this forward message for the Net Green Foundation Magazine, underscoring the critical role of community-driven organizations and visionary policies in shaping a sustainable future.

Haryana's cultural and historical richness is complemented by a dynamic economy. From the agricultural fields that nourish our nation to the high-tech industries powering our growth, our state is recognized as a land of opportunity. However, we also face pressing challenges such as air pollution, water scarcity, soil degradation, and climate change—challenges that call for progressive policies and collaborative initiatives.

Inspired by the "Panchamrit" goals articulated by Hon'ble Prime Minister

Narendra Modi at COP26, we have embraced commitments that include expanding renewable energy capacity, reducing carbon emissions, lowering economic carbon intensity, and achieving net-zero emissions by 2070. These goals serve as beacons guiding our policies and actions, ensuring that our growth is sustainable and our environment protected.

In Haryana, the translation of the Panchamrit vision into actionable programs is multifaceted. We are rapidly advancing our clean energy transition through our Solar Mission, which promotes rooftop solar installations in industries and residential areas by offering net metering and financial subsidies. In parallel, we are exploring wind and biomass potentials to ensure that every region's unique renewable resources are harnessed effectively. Industrial decarbonization is another cornerstone of our strategy.

Our progressive EV Policy incentivizes electric mobility with tax exemptions and infrastructure development, while green manufacturing initiatives encourage energy-efficient technologies and waste heat recovery, fostering a circular economy.

Agricultural and rural transformation remains vital for our state. Our Mission



for Sustainable Agriculture focuses on water-efficient practices, organic farming, and crop diversification. By training farmers to adopt sustainable methods, we aim to reduce environmental impact while ensuring food security and boosting livelihoods. Complementary to this is our "Green India" Mission, which drives afforestation programs that not only sequester carbon but also stabilize soil and conserve water.

Urban sustainability is another priority. Our State Action Plan on Climate Change and the Mission on Sustainable Habitat are designed to build resilience in urban centers such as Gurugram and Faridabad. These initiatives integrate energy-efficient buildings, robust waste management, and green public spaces into city master plans, promoting urban environments that are both vibrant and resilient. We also prioritize water resource management by implementing watershed management, check dams, and micro-irrigation systems. Our "Hamare Taalab, Hamare Dharohar" initiative revives traditional water bodies, promoting rainwater harvesting and community engagement to preserve these essential resources.

Air pollution control is a pressing concern. Our Haryana Clean Air Project for Sustainable Development (HCAPSD), implemented in collaboration with the World Bank, employs policy reforms and technology upgrades to combat pollution. Special measures during winter, including stubble management and stricter enforcement of pollution norms, have significantly improved air quality during critical periods.

The success of these initiatives is visible across our state. In Karnal, smallholder farmers have shifted from water-intensive crops to climate-resilient varieties, supported by our sustainable agriculture programmes. In Rohtak, industrial clusters have adopted cleaner energy practices, while in Gurugram, rooftop solar panels and waste segregation programs are transforming urban sustainability. Reforestation and biodiversity conservation efforts in the Aravalli ranges further exemplify our commitment to a greener future.

Yet, challenges remain. Rapid urbanization pressures our land and water resources, and climate variability brings extremes—from floods to droughts—that test our resilience. Industrial expansion, while critical for economic growth, must be managed responsibly to avoid environmental degradation. To address these challenges, we are refining our policies continuously based on new data and stakeholder feedback. We are

deepening public-private partnerships, harnessing technological innovation such as AI and blockchain for efficient resource management, and engaging local communities through education and capacity-building initiatives.

Looking ahead, our strategy focuses on sustained awareness and advocacy.

Continuous media engagement, educational programmes, and recognition through awards will maintain momentum and motivate more stakeholders to adopt eco-friendly practices. We believe that every action, no matter how small, contributes to a larger tapestry of change. By supporting clean technologies, sustainable agriculture, robust waste management, and biodiversity conservation, we can collectively build a future where economic progress coexists with environmental health.

I extend my deepest gratitude to Net Green Foundation for providing this platform—a beacon that inspires us to become true stewards of the environment. Through initiatives spanning Media Amplification, the Academy, Centres of Excellence, Awards & Events, and Grass-root Level Action, Net Green Foundation reflects our state's broader mission for sustainability.

Together, let us shape a future where our children inherit abundant natural resources, clear skies, and a balanced relationship with nature. Our journey toward net-zero emissions and sustainable growth is challenging yet filled with promise, driven by the synergy of government, industry, and civil society. I pledge Haryana's unwavering support in this noble mission, reaffirming that only through collective action can we realize a Net Green future.

Thank you for joining us on this transformative journey.

**Warm Regards,**

Shri Rao Narbir Singh  
Minister of Industry and Commerce,  
Environment, Forest and Wildlife,  
Foreign Cooperation, Sainik & Ardh Sainik Welfare,  
Government of Haryana



### Ms. Sunita Bhatia

Director,  
Net Green Foundation  
[sunita@netgreenfoundation.com](mailto:sunita@netgreenfoundation.com)

## LETTER FROM DIRECTOR

### Dear Reader,

I hope this message finds you well and inspired by the promise of a sustainable future. As Director of Net Green Foundation, I am honored to share our vision and reaffirm our commitment to nurturing a healthier planet. At the heart of our mission lies a timeless truth: "The Earth does not belong to us—we belong to the Earth." This guiding principle reminds us that our actions today shape the world that future generations will inherit.

In a rapidly changing world, we face an unprecedented confluence of environmental, social, and economic challenges. Climate change, resource depletion, and biodiversity loss are not distant threats; they are present realities that demand our collective attention and action. Our organization is dedicated to bridging the gap between visionary ideas and practical solutions, empowering communities, businesses, and policymakers to take decisive steps toward sustainability.

Our approach is holistic and inclusive. We believe in harnessing the power of collective action to drive meaningful change. Whether through community-

led projects, innovative public-private partnerships, or forward-thinking policies, every action, no matter how small, contributes to a larger tapestry of environmental stewardship. At Net Green Foundation, we strive to empower every individual and organization to become a sustainability champion. We provide practical tools, insightful research, and a platform for sharing success stories that inspire and mobilize action across all sectors of society.

In our global quest for a net-zero future, we recognize that innovation is key. Technological advancements from renewable energy solutions and energy-efficient systems to cutting-edge data analytics are transforming the way we manage resources and reduce environmental impacts. Our commitment is to make these innovations accessible, ensuring that sustainable practices become the norm rather than the exception. By simplifying the complex and making sustainability management more intuitive, we aim to unlock new opportunities for economic and social progress while safeguarding the natural world.



Our work is also deeply rooted in education and awareness. We believe that the journey toward a sustainable future begins with knowledge. Through our publications, workshops, and online resources, we strive to disseminate actionable insights that inspire change. It is our hope that by sharing real-world examples of sustainable practices, we can motivate others to take up the mantle of environmental stewardship. In this interconnected world, every organization and every individual has the potential to make a significant impact. We invite you to join us in this endeavor, to learn, share, and collaborate on solutions that promote a more sustainable and equitable world.

Looking ahead, our vision is clear. We must continue to innovate, collaborate, and act with urgency. The challenges we face are complex, but they are not insurmountable. Our collective determination can transform these challenges into opportunities for growth and renewal. At Net Green Foundation, we are committed to leading this transformation by

fostering an environment where sustainable practices are embraced and celebrated at every level from local communities to global industries.

I encourage you to explore our initiatives, engage with our research, and join the conversation. Together, we have the power to reshape our world into a place where economic progress is measured not just by financial success, but by the health of our environment and the well-being of our communities.

Thank you for your ongoing support and commitment to creating a sustainable future. Let us move forward with the conviction that every positive action contributes to a larger change. As we embark on this journey, let us remember that we are not the masters of the Earth, but its stewards responsible for nurturing and protecting it for generations to come.

With gratitude and resolve,

**Sunita Bhatia**  
Director



**Mr. Anwar Sadat**  
Managing Editor  
Net Green Foundation  
[anwar@netgreenfoundation.com](mailto:anwar@netgreenfoundation.com)

## LETTER FROM THE EDITOR

Dear Reader,

It is with immense pride and great anticipation that I welcome you to the inaugural issue of the Net Green Foundation Magazine. This publication represents not just the culmination of months of effort but also the beginning of a transformative journey—a journey that mirrors humanity's path toward realizing the vision of a Net Zero world. The theme for this first edition, "Zero to Infinity: The Human Journey from Limitation to Limitlessness," perfectly encapsulates the spirit of this endeavour.

Since its discovery in ancient India, zero has held profound significance. Mathematically, it is a starting point, a neutral ground from which all numbers spring, both positive and negative. Symbolically, zero represents potential—a blank slate ready to be filled with infinite possibilities. In the context of our mission, zero is not about absence; it is about presence—the presence of clarity, intentionality, and boundless opportunities that emerge when we clear the slate of excess and imbalance. Our aim is a world with zero emissions, zero waste, and zero inequality.

Infinity speaks to the unlimited potential that lies beyond achieving Net Zero. Imagine a world where economies thrive on renewable energy, where innovation is unrestricted by finite resources, and where communities coexist in harmony with nature. This vision is not a utopian ideal, but rather the natural

progression of human ingenuity when guided by purpose and collaboration.

The journey from zero to infinity is one we cannot undertake alone. It is a collective mission that requires the participation of individuals, corporations, governments, and global institutions. Each contribution is vital. At the Net Green Foundation, we see ourselves as facilitators and connectors— bringing together diverse stakeholders to share knowledge, forge partnerships, and catalyze action.

This magazine is more than just a publication; it is a platform for dialogue, inspiration, and action. Through its pages, we aim to:

**Celebrate Pioneers:** Highlight the stories of Net Zero Heroes—visionaries and doers who are leading the way in sustainability, innovation, and social impact.

**Educate and Inform:** Provide in-depth analyses of key issues—from renewable energy adoption to sustainable agriculture and climate finance. **Inspire Action:** Share practical tips, case studies, and success stories to empower readers to take meaningful steps in their own lives and communities.

**Foster Collaboration:** Showcase how partnerships can amplify impact, demonstrating that the power of collaboration is limitless.

The Intergovernmental Panel on Climate Change (IPCC) has made it clear: the time for incremental change



has passed. We must act decisively and ambitiously to limit global warming to 1.5°C. The Net Green Foundation is committed to aligning with this imperative, guided by India's Panchamrit commitments to achieve Net Zero by 2070. These commitments are global imperatives that include increasing renewable energy capacity, reducing carbon intensity, and embracing a circular economy.

In this launch edition, you'll find a rich tapestry of content that reflects our theme:

**Profiles of Net Zero Heroes:** Stories of individuals and organizations driving transformational change in clean energy and environmental restoration.

**Technological Breakthroughs:** Insights into green technology advancements shaping a sustainable future.

**Global Perspectives:** A focus on how different countries are tackling climate change, with special attention to India's leadership role.

**Actionable Insights:** Practical advice for integrating sustainability into everyday life.

**Future Visions:** Thought-provoking essays on the world after achieving Net Zero.

At its core, the journey to Net Zero is a deeply human one. It is about rethinking our relationship with the planet, our communities, and ourselves. It is about resilience, creativity, and the unwavering belief that we can overcome any challenge when we work together. This magazine is dedicated to amplifying the human stories that make this journey possible.

As readers, you are an integral part of this mission.

This magazine is not a one-way communication—it is a conversation. We invite you to share your thoughts, stories, and ideas. What does zero mean to you? How do you envision infinity? What steps are you taking toward sustainability? Your voice matters, and together, we can build a movement that transcends borders and barriers.

This launch issue is just the beginning. In the months to come, Net Green Foundation Magazine will continue to evolve, reflecting the dynamic and ever-expanding field of sustainability. We will explore new themes, tackle emerging challenges, and celebrate the milestones we achieve as a global community.

I would like to extend my heartfelt gratitude to our contributors, partners, and readers for making this magazine a reality. Your support and engagement are what drive us forward. As we embark on this journey together, I am filled with hope and optimism.

Let us move from zero to infinity, from limitation to limitless, and from aspiration to action. The path ahead is challenging, but it is brimming with promise. Together, we can create a future that is sustainable, equitable, and inspiring.

Thank you for being part of this journey. Let's make history—one step, one story, and one action at a time. With infinite possibilities,



**Anwar Sadat**  
Managing Editor



## LETTER FROM THE EDITOR-IN-CHIEF

**Mr. Umesh Kumar Sharma**

Editor-in-Chief  
Net Green Foundation  
[umesh@netgreenfoundation.com](mailto:umesh@netgreenfoundation.com)

Dear Reader,

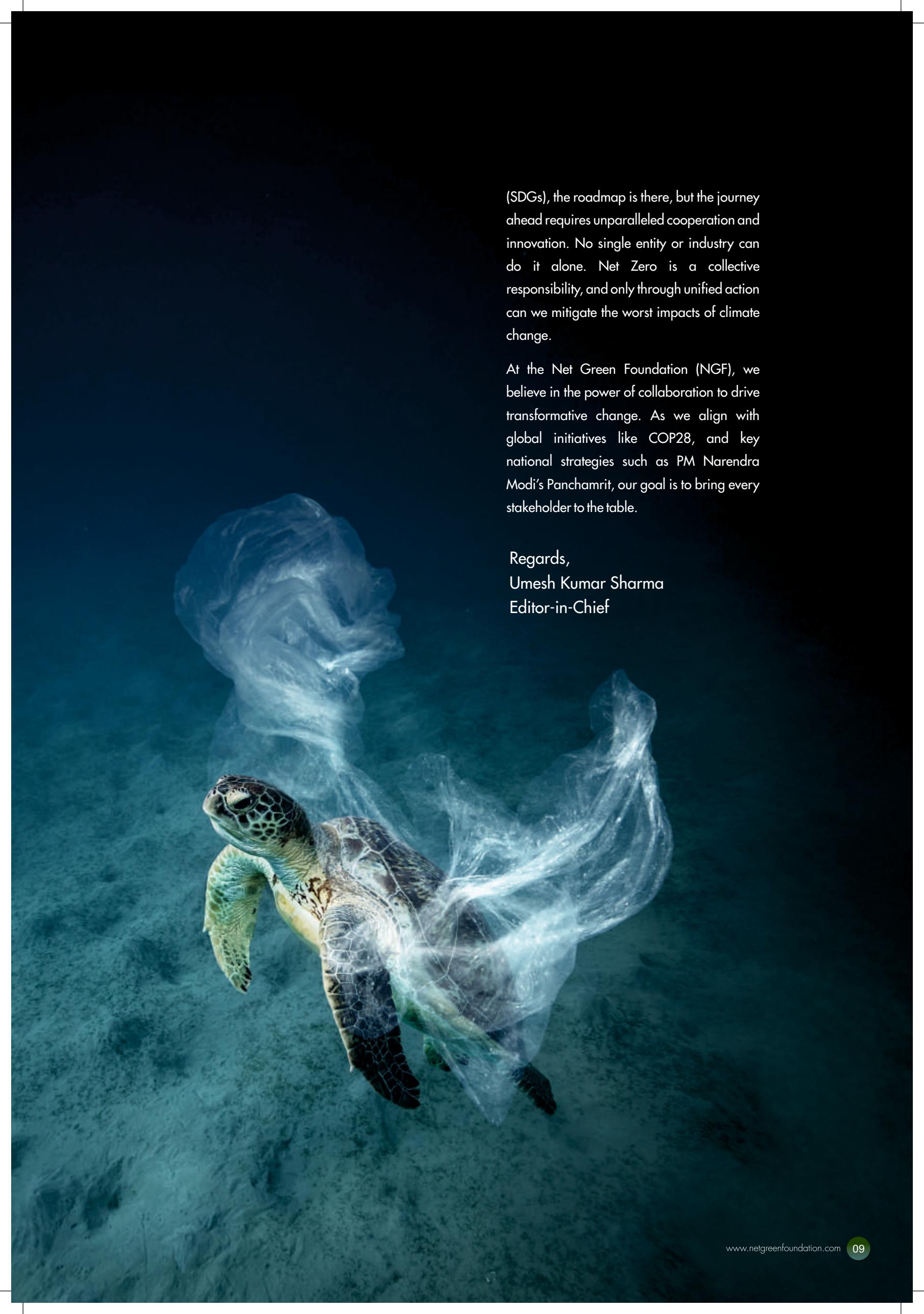
It is with great excitement and a deep sense of responsibility that I welcome you to the launch issue of Net Green Foundation Magazine. Our mission is clear: to provide a unified platform where all stakeholders— governments, industries, innovators, researchers, and citizens—can come together and collaborate on the urgent global challenge of achieving Net Zero. The clock is ticking.

The climate crisis demands that we act swiftly and decisively. From the historic agreements forged in the Paris Accord to the ambitious targets set by the UN Sustainable Development Goals (SDGs), the roadmap is there, but the journey ahead requires unparalleled cooperation and innovation. No single entity or industry can do it alone. Net Zero is a collective responsibility, and only through unified action can we mitigate the worst impacts of climate change.

At the Net Green Foundation (NGF), we believe in the power of collaboration to drive transformative change. As we align with global initiatives like COP28, and key national strategies such as PM Narendra Modi's Panchamrit, our goal is to bring every stakeholder to the table. It is with great excitement and a deep sense of responsibility that I welcome you to the launch issue of Net Green Foundation Magazine. Our mission is clear: to provide a unified platform where all stakeholders— governments, industries, innovators, researchers, and citizens—can come together and collaborate on the urgent global challenge of achieving Net Zero. The clock is ticking.

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Regards,  
Umesh Kumar Sharma  
Editor-in-Chief

# Key Challenges



Public Resistance To Change

Economic Disparities

Inadequate Public Awareness

Misinformation And Climate Denial

Limited Access To Resources



**Vision:**  
Sustainability Through Collective Action

**Mission:**  
Community empowerment through content,  
collaboration and capability creation

**Purpose:**  
Communities and ecosystems thriving in harmony

# The Climate Crisis



Rising Global Temperature

Shrinking Natural Resources

Extreme Weather Events

## Events and Exhibitions

Host dynamic events such as conferences, award ceremonies, and exhibitions to bring together stakeholders, recognize trailblazers, and spotlight cutting-edge innovations driving the Net Zero transition.

### Core Strategies:

**Conferences & Forums:** Organize global gatherings with thought leaders, policymakers, and innovators to share best practices, research, and actionable strategies.

**Award Ceremonies:** Recognize and celebrate organizations, individuals, and initiatives leading the charge in climate action and sustainability.

**Exhibitions & Showcases:** Create immersive platforms for showcasing groundbreaking technologies, solutions, and Net Zero initiatives, facilitating networking and collaboration.

## Centres of Excellence

Establish transformative hubs for Net Zero innovation by partnering with universities, think tanks, and global experts to drive research, train the next generation, and accelerate technology transfer.



### Core Focus Areas:

**Training & Capacity Building:** Develop future leaders with cutting-edge sustainability skills.

**Research & Innovation:** Accelerate the development of sustainable technologies for a Net Zero future.

**Technology Transfer:** Facilitate the adoption and scaling of green technologies across industries.

# Stakeholder Collaboration

Forge strategic partnerships among corporates, schools, NGOs, and policymakers to create a unified approach towards achieving sustainability goals.

## Core Focus Areas:

**Forums & Knowledge Sharing:** Facilitate platforms for dialogue, innovation, and knowledge exchange.

**Shared Goals:** Align all stakeholders around common sustainability objectives for greater impact.

**Monitored Progress:** Track and evaluate the progress of collaborative initiatives, ensuring accountability and results.

# Transformative Media

Deliver impactful media through publication, reports, podcasts, webinars, and digital storytelling to inspire action and empower stakeholders toward a Net Zero future.

## Core Strategies:

**Reports & Publications:** Share groundbreaking research, expert insights, and policy recommendations to influence decision-makers.

**Podcast & Webinar Series:** Host engaging conversations with industry leaders, researchers, and policymakers to provide actionable knowledge and solutions.

**Digital Storytelling:** Use videos, social media, and online platforms to amplify success stories, showcase innovative initiatives, and highlight Net Zero champions.

# Grass-root Level Action

Mobilize and engage local communities through tree plantations, renewable energy workshops, and localized sustainability projects to drive collective action toward a Net Zero future.



## Core Strategies:

**Tree Plantation Initiatives:** Organize large-scale local tree planting drives to restore ecosystems, enhance carbon sequestration, and promote biodiversity.

**Renewable Energy Workshops:** Educate and equip communities with the knowledge and tools to adopt renewable energy solutions, such as solar and wind power.

**Localized Sustainability Projects:** Empower communities to implement practical, sustainable solutions for waste management, water conservation, and food security, ensuring resilience and climate adaptation.

# Pioneering Creativity:

## The Vermillion Legacy



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Fully integrated "Make in India" agency.

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# Our Area of Work



- 1. Centres of Excellence**
- 2. Stakeholder Collaboration**
- 3. Media Amplification**
- 4. Transformative Media**
- 5. Events and Exhibitions**
- 6. Grass-root Level Action**



# Verdical Group

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**TARGET OF CONNECTING  
100 MILLION PEOPLE TO  
CLEAN ENERGY  
BY 2030 REFLECTS  
OUR COMMITMENT  
TO ADDRESSING  
ENERGY POVERTY  
AND COMBATING  
CLIMATE CHANGE  
IN AFRICA.**



**YARIV COHEN**  
Co - Founder and CEO of Ignite Power

**1. Ignite Power's Vision and Ambition**

**Ignite Power is committed to providing sustainable energy solutions to underserved African communities. What inspired your focus on this mission, and what core values drive your organization forward?**

Ignite Power is dedicated to delivering sustainable energy solutions to underserved communities across Africa. Our focus on this mission arises from a deep recognition of the

critical need for basic services, particularly energy, in these regions. Our core values—compassion, innovation, empowerment, and collaboration—drive us to uplift communities, ensuring that no one is left behind in the journey toward progress. Inspired by Africa's spirit of compassion, we are committed to building a future where everyone can access clean energy.





### 2. Setting the 100 Million Goal

**Ignite Power aims to connect 100 million people to clean energy by 2030. What inspired this target, and how are you ensuring you stay on track to meet this goal?**

Our ambitious target of connecting 100 million people to clean energy by 2030 reflects our commitment to addressing energy poverty and combating climate change in Africa. This goal was inspired by the staggering number of individuals without basic energy access and the transformative potential of solar energy. To stay on track, we are investing in innovative technologies, expanding strategic partnerships, and continuously enhancing our operational efficiency to effectively reach more communities.

### 3. Carbon Credits for Accelerated Impact

**With your recent carbon off-take agreement with SEFE, how do carbon credits support the scaling of your clean energy projects across Africa? What role do carbon credits play in making renewable energy projects viable?**

Our recent carbon off-take agreement with SEFE

enables us to leverage carbon credits as a crucial support mechanism for scaling our clean energy projects. These credits provide an additional revenue stream that enhances the financial viability of our renewable energy initiatives. By utilizing carbon credits, we can reinvest in expanding access to clean energy across Africa, while also contributing to global climate objectives.

### 4. Overcoming Energy Poverty in Africa

**Energy poverty remains a critical issue**





across Africa. How is Ignite Power addressing this challenge, and what impact have you seen on the quality of life in rural and underserved communities?

Ignite Power addresses energy poverty by providing affordable solar solutions tailored to the needs of deeply rural communities. Our efforts have led to significant improvements in quality of life, including increased safety, better health outcomes, and greater economic opportunities. By enabling families to access reliable energy, we are helping them break the cycle of poverty and enhance their overall well-being.

### 5. Scaling Operations in Diverse Markets

What are the unique challenges of scaling distributed renewable energy solutions across different African markets, and how has Ignite Power successfully navigated these challenges?

Scaling distributed renewable energy across diverse African markets involves unique challenges, including regulatory variations, differing infrastructure levels, and cultural nuances. Ignite Power has successfully navigated these complexities through thorough market assessments, strategic local partnerships, and by tailoring our solutions to meet each community's specific needs. By supporting local employment, we deepen our understanding of local cultures and needs, enabling us to effectively enter and serve each market.

### 6. Empowering Women and Youth through Solar Energy

How does Ignite Power involve and empower women and youth in its renewable energy projects? Are there specific success stories that highlight the transformative impact on these groups?

We actively involve and empower women and youth in our renewable energy projects by offering training and job opportunities across roles in management, technology, installation, maintenance, and more. For example, female technicians have become role models within their communities, illustrating the powerful impact of solar energy on women's empowerment and youth employment. These efforts foster a more inclusive economy, transforming lives and inspiring new opportunities for growth and progress.

### 7. Clean Cooking Solutions and Climate Impact

Ignite Power is expanding into clean cooking solutions, which have significant health and climate benefits. Can you explain how these solutions work and their broader impact on the environment and communities?

Our clean cooking solutions use efficient technologies that significantly reduce indoor air pollution and dependence on harmful fuels. These solutions improve health by lowering respiratory issues and have broader environmental benefits, such as reducing deforestation and greenhouse gas emissions. This dual impact supports communities in transitioning to more sustainable practices, enhancing both environmental and public health outcomes.

### 8. Role of Partnerships in Scaling Impact

How have partnerships with local governments, NGOs, and international organizations enabled Ignite Power to expand its impact? Are there any standout collaborations that have helped accelerate your mission?

Partnerships with local governments, NGOs, and international organizations have been essential in expanding our impact. A standout collaboration with the World Bank, for example, has enabled us to reach impoverished communities with highly affordable solutions that address their daily needs. These



## POWERING AFRICA'S CLEAN FUTURE

partnerships accelerate our mission by pooling resources, expertise, and local insights, allowing us to effectively serve and uplift underserved populations.

### 9. Navigating Regulatory Landscapes

**Different African countries have varying regulatory frameworks for renewable energy. What have been some of the biggest regulatory hurdles for Ignite Power, and how have you addressed them?**

Navigating diverse regulatory frameworks presents challenges, particularly regarding permitting processes and tariff structures. We address these hurdles by proactively engaging with policymakers, advocating for supportive policies, and adapting our business model to align with local regulations. With a decade of operational experience, these challenges have become less daunting, as our expertise enables us to overcome them more effectively.

### 10. Financing Models for Affordability

**One of Ignite Power's strengths is making solar energy affordable. Could you explain the innovative financing models you've adopted, and how these models enable wider access to clean energy?**

Ignite Power utilizes innovative financing models, such as pay-as-you-go and microfinancing, to make solar energy accessible and affordable. By offering flexible payment plans, we allow families to access clean energy without financial strain, significantly broadening our reach. Our commitment to extreme affordability ensures we can serve deep-rural communities, delivering sustainable solutions to those who need them most.

### 11. Expanding Digital Access through Solar-Powered Internet

**With LinX, your solar-powered internet solution, you aim to close the digital divide. How are you planning to scale this solution across Africa, and what are the primary challenges you anticipate?**





## POWERING AFRICA'S CLEAN FUTURE

With LinX, our solar-powered internet solution, we aim to bridge the digital divide in Africa. Scaling this initiative involves partnering with international broadband providers and addressing existing infrastructure gaps. We anticipate challenges such as regulatory compliance; however, our focus remains on creating sustainable access to information and resources. By integrating our commitment to extreme affordability into the sector, we aim to enable a digital revolution across multiple countries and regions, connecting millions of people to the internet.

### 12. Solar-Powered Irrigation and Agricultural Productivity

**Agriculture is the backbone of many African economies. How does Ignite Power's solar irrigation solution contribute to improving food security and supporting rural farmers?**

Ignite Power's solar irrigation solutions empower rural farmers by providing reliable access to water, which enhances crop yields and increases productivity. This directly contributes to food security and economic resilience in agricultural communities, enabling them to thrive. Given that agriculture is Africa's largest sector, a significant GDP contributor, and a major employer, every improvement makes a difference. Our customers report experiencing three times the harvesting seasons and up to a 75% increase in yields.

### 13. The Zayed Sustainability Prize and Its Impact

**Winning the Zayed Sustainability Prize at COP28 was a significant achievement for Ignite Power. How has this recognition affected your operations, partnerships, and future goals?**

Winning the Zayed Sustainability Prize at COP28 is the highest honour for a company in our industry. The funding from this award is being directed towards providing millions more with our sustainable solutions. Additionally, the recognition has elevated our visibility, attracting new partnerships and funding opportunities. This accolade not only validates our approach but also galvanizes our commitment to making a more significant impact in renewable energy and community empowerment.

### 14. Technological Innovation in Renewable Energy

**Innovation is essential in renewable energy. What emerging technologies or product innovations excite you most, and how will they shape Ignite Power's future offerings?**

At Ignite Power, we prioritize innovation and embrace a technology-driven approach. Our commitment to continuous improvement drives us to develop cutting-edge solutions that not only benefit our customers but also advance the entire sector and address the evolving needs of our communities. By staying at the forefront of technological advancements, we ensure that our initiatives are impactful and sustainable, ultimately driving positive change for the communities we serve.

### 15. Data-Driven Decision-Making in Renewable Energy

**How does Ignite Power leverage data and digital tools to improve decision-making, optimize energy distribution, and ensure the sustainability of its projects?**

Ignite Power leverages data analytics and digital tools to enhance decision-making and optimize energy distribution. By analyzing user patterns and energy needs, we can effectively tailor our solutions to ensure project sustainability and maximize impact. This data-driven approach enables us to make informed decisions that align with the specific requirements of the communities we serve.

### 16. Adapting to Post-Pandemic Realities

**The COVID-19 pandemic disrupted supply chains and posed challenges for companies globally. How did Ignite Power manage these disruptions, and what were the key lessons learned?**

During the COVID-19 pandemic, we encountered significant supply chain disruptions but adapted by diversifying our suppliers and enhancing our local sourcing strategies. Key lessons learned include the critical importance of flexibility and resilience in operations, which will guide our approach moving forward.

### 17. Solar Energy as a Climate Solution

**Renewable energy plays a critical role in mitigating climate change. How does Ignite Power's work directly contribute to reducing carbon emissions and supporting climate adaptation in Africa?**

## POWERING AFRICA'S CLEAN FUTURE

Ignite Power contributes to mitigating climate change by providing clean, renewable energy that reduces reliance on fossil fuels. Each solar installation directly lowers carbon emissions, helping to combat the climate crisis while simultaneously improving the lives of millions. Our initiatives not only address energy poverty but also enhance climate resilience in vulnerable communities across Africa.

### 18. Accessing Climate Finance for Growth

**How important is climate finance in scaling your projects, and what strategies have you employed to access these funds? How has it contributed to your overall growth?**

Climate finance is essential for scaling our projects. With many development entities, large investors, and venture capitalists increasingly focused on addressing climate change, access to funding in this sphere is becoming more viable. This support has been crucial for our growth, enabling us to reach more communities and expand our impact significantly.

### 19. The Role of Solar Energy in SDG7

**Ignite Power's work contributes to achieving the UN Sustainable Development Goal 7 (Affordable and Clean Energy). What specific milestones are you aiming for in the next 2-3 years to advance this goal?**

In the next 2-3 years, we aim to extend our reach to additional communities, enhance our technology offerings, and collaborate with more local organizations to drive progress toward SDG 7. Key milestones include expanding our operations into new countries and developing innovative products tailored to local needs. The more geographies we enter, the larger our target market becomes. With 660 million people still living without electricity, only off-grid solar solutions can effectively address this issue at the necessary scale.

### 20. Ensuring Long-Term Sustainability

**As Ignite Power continues to grow, what measures are in place to ensure that this growth remains environmentally sustainable while balancing financial sustainability?**

To ensure long-term sustainability, Ignite Power emphasizes environmental stewardship, community engagement, and financial viability.

We continuously assess our impact, invest in community capacity-building, and prioritize projects that strike a balance between economic growth and ecological preservation. This holistic approach allows us to foster growth while safeguarding the environment for future generations.

### 21. Productive Uses of Solar Energy

**Beyond lighting and basic energy needs, how does Ignite Power promote the productive use of solar energy in rural communities to create economic opportunities?**

Ignite Power goes beyond meeting basic energy needs by promoting productive uses of solar energy that enable local businesses to operate more efficiently. We provide access to solar-powered solutions for agricultural activities, such as irrigation, which enhances productivity. These initiatives create economic opportunities and foster community resilience, empowering individuals and businesses to thrive.

### 22. Expanding into West and East Africa

**Ignite Power has made strategic acquisitions in West Africa (Oolu) and Kenya (Mwezi Solar). How do these acquisitions align with your overall vision, and how will they help you accelerate access to energy?**

The strategic acquisitions of Oolu in West Africa and Mwezi Solar in Kenya align with our vision to enhance energy access across diverse markets. These expansions allow us to leverage local expertise and rapidly scale our impact in these regions. We are committed to ongoing market consolidation, with plans to acquire and penetrate additional companies and markets to further accelerate access to clean energy.

### 23. Localizing Operations for Success

**How important is local knowledge in the success of renewable energy projects? Can you share how you have tailored your operations to different regions for maximum impact?**

Local knowledge is essential to the success of our renewable energy projects. We tailor our operations by actively engaging local communities in the planning process and adapting our solutions to meet their unique needs. This approach ensures maximum impact





## POWERING AFRICA'S CLEAN FUTURE

and fosters community acceptance, allowing us to create solutions that are both effective and sustainable.

### 24. Climate Change and Resilience in Rural Africa

**How does providing renewable energy solutions contribute to building climate resilience in African rural communities, particularly in regions vulnerable to extreme weather conditions?**

Providing renewable energy solutions

contributes to building climate resilience by enabling communities to adapt to changing weather patterns. Access to clean energy enhances their ability to prepare for and recover from climate-related shocks.

### 25. Addressing the Digital Divide through Energy

**In many African communities, the digital divide is a significant challenge. How does Ignite Power's solar-powered internet offering help bridge this gap, especially in rural areas?**

Ignite Power's solar-powered internet offering plays a crucial role in bridging the digital divide, especially in rural areas. By providing reliable internet access, we empower communities with essential information, educational resources, and economic opportunities. This connectivity enhances their overall quality of life, enabling them to participate more fully in the digital economy and access vital services.

### 26. Access to Clean Energy for Refugees

**Energy access for refugees and displaced people is a growing concern. Does Ignite**

**Power have any initiatives targeted at providing clean energy solutions for these vulnerable populations?**

At Ignite Power, we acknowledge the pressing issue of energy access for refugees and displaced populations. We are actively exploring initiatives to deliver clean energy solutions tailored to the needs of these vulnerable groups. Our goal is to support their basic energy requirements and significantly enhance their living conditions, helping them rebuild their lives with greater resilience and dignity.

### 27. Scaling Off-Grid Solutions Post-2024

**What trends do you foresee in the off-grid renewable energy space in Africa beyond 2024, and how is Ignite Power positioning itself to lead in this evolving market?**

Beyond 2024, we anticipate a significant increase in investment in off-grid renewable energy solutions across Africa, driven by the urgent need for energy access and climate action. Ignite Power is strategically positioning itself to lead in this evolving market by prioritizing innovative technologies and scalable business models tailored to the diverse needs of communities. Our commitment to collaboration and local engagement will further enhance our ability to respond effectively to emerging opportunities and challenges.

### 28. Key Lessons Learned in Scaling Renewable Energy

**Having expanded into multiple countries, what key lessons have you learned about scaling renewable energy solutions in emerging markets? What advice would**



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### **you give to other companies?**

Through our expansion into multiple countries, we have learned that adaptability, local partnerships, and community engagement are crucial for successfully scaling renewable energy solutions. Understanding the unique contexts of each market is essential for effective implementation. My advice to other companies is to prioritize building strong relationships with local stakeholders and to remain flexible in adapting their strategies to meet specific community needs.

### **29. Leadership Lessons from Renewable Energy**

**As the CEO of a rapidly growing company in a critical sector, what leadership lessons have you learned, and how do you inspire your team to remain mission-driven in challenging environments?**

As CEO, I've learned that effective leadership hinges on resilience, empathy, and a clear vision. To inspire my team to remain mission-driven, I cultivate a culture of collaboration and innovation, ensuring that everyone feels a deep connection to our mission of making a meaningful difference. By recognizing individual contributions and encouraging open communication, we can navigate challenges together and stay focused on our goals.



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Dr Renuka Thakore, Founder & CEO, [ceo@gsfn.co.uk](mailto:ceo@gsfn.co.uk)

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**The “delivery of everything now” society we've created depends heavily on third-party logistics operators. How do they capitalize on their expansions?**



**Adam Ridgway**  
Founder & CEO, One Moto

- 1 **Reflections On Cop28 And Future Global Expansion**
  - a. **ONE MOTO was recognized as a key player in sustainable mobility at the PwC Net Zero Future50 – Middle East. How did your participation in COP28, held in Dubai, contribute to advancing ONE MOTO's efforts towards decarbonisation and zero-emission transportation?**

COP28 was a great event that really placed our minds and attention on the planetary issues we

all face. It also showcased the breadth of innovations available to tackle these issues.

For ONE MOTO, our presence and activation were approached as a knowledge transfer exercise. Many do not understand the environmental impact last-mile delivery has, yet they see the economic positives. The “delivery of everything now” society we've created depends heavily on third-party logistics operators. How do they capitalize on their expansions? We discussed intelligent finance offerings,





## DRIVING THE ELECTRIC FUTURE

demonstrating how building a commitment-based brand builds trust and recognition. This commitment to "doing things right" is well received by consumers and aligns with their values.

Receiving acclaim from PwC as a Future50 company was incredible. My father always said, "Effort equals results." Building an impact-driven business designed to bring change is an emotional journey, and this recognition has certainly empowered us and placed us in the headlines with other pioneering companies.

- b. As global COP events continue to shape climate action, what role does ONE MOTO envision playing in future conferences to drive innovation in sustainable mobility and expand internationally?**

Even before COP28, I've been speaking on stages worldwide, presenting narratives of weighted importance that trigger action. This approach has helped us expand into 13 countries so far, start conversations with 24 others, and establish a thought-leadership presence with government bodies. We aim to continue this work, and as conversations evolve, my talks are enriched with engaging content. Rather than focusing on what needs to be done, I showcase what is already being done and the



environmental, financial, and welfare impacts it brings to the riders and drivers in this sector.

### 2. Building a Global EV Ecosystem

- a. ONE MOTO aims to build the largest electric mobility ecosystem in the world. Could you elaborate on your long-term strategy for creating this ecosystem, and how it addresses the specific needs of urban commuters and last-mile delivery industries?**

Indeed we are. Although "ecosystem" has become somewhat of a cliché, we are building one in the truest sense of the word. We enter





unexpected markets where we know how to create a positive impact to make them successful. This approach builds trust and confidence in our brand, our vehicles, and our partners. Our distribution network includes after-sales services, battery solutions, telemetry (utilising big data and AI), intelligent finance options, future-proofing the vehicles and formats we offer, and continuous innovation. This reflects a long-term, bold vision where we are not just here to sell; we are here to provide mobility for everyone.

**b. What are the major challenges in achieving this global vision, especially as you expand into new markets like India, Ethiopia, and Sri Lanka?**

Certain markets are more challenging than others; the processes are similar in each market, but the bureaucracy differs. Geo-political tensions and economic diversity contribute to these challenges. However, as we operate a modular organization, we can overcome them. Working with the right partners and collaborating with the best is essential, yet this can only happen if they believe in what we've built.

**c. How do you ensure that the unique requirements of each regional market are met while maintaining the integrity and core values of your brand?**

Integrity and consistency are of critical importance to us. Our business is built on five core values—Sustainability, Affordability, Convenience, Technology, and Experience—each equally weighted. Our partners must align with this framework, which allows us to present a consistent narrative to any market. For some customers, technology isn't a buying trigger; experience is. For some B2B customers, affordability and convenience matter more than experience. We adapt our message to meet

these varying needs, which allows us to maintain consistency throughout.

**3. Scaling Decarbonisation of Last-Mile Delivery**

**a. ONE MOTO is focused on decarbonizing the last-mile industry. Could you share some specific success stories where your electric vehicles have significantly reduced carbon emissions for major delivery companies?**

I have to let our customers announce their successes and rewards, as they are the brave ones who took the risk. However, I can elaborate on the impact we've had in the UAE. There are 92,000 petrol delivery motorcycles on the roads of Dubai, producing over 260,000 tonnes of CO<sub>2</sub> each year. It would take over 290,000 acres of forest to sequester this amount, which is 10 times the size of Paris. And that's just motorcycles; there are 320,000 commercial vehicles in Dubai, so the environmental impact is massive.

To put this in perspective, there are 37,000,000 motorcycles in India, 20,000,000 in Pakistan, 67,000,000 in Vietnam, and 9,000,000 in Africa. The 92,000 in Dubai seemed like a lot at first, but the global problem is far more alarming.

Discussing the financial benefits, since switching to our fleet, third-party logistics operators (3PLs) have saved 74% in operational costs on our electric motorcycle, Byka, and 59% on our Light Commercial Van, Deliva. Depending on fleet sizes, this can amount to hundreds of thousands of dollars saved annually. For drivers and riders, not spending on fuel has saved around 29% of their annual net salary. The early adopters are winning with an ROI in 5-7 months.

**b. With the booming e-commerce and q-commerce markets, particularly in countries like India, how is ONE MOTO**





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### **positioned to address the growing need for sustainable delivery solutions?**

India is challenging in several ways. Two critical considerations are: 1) it's a very price-sensitive market, and 2) a mindset shift toward sustainability is needed. Sustainability isn't yet a top priority. After spending time in various cities, it's clear that littering and pollution are significant issues, and it will take a generation to address them. To tackle price sensitivity, we ensure our vehicles are affordable by working with leading financiers who believe in long-term returns. With some Indian OEMs misusing subsidies and eroding market trust, only those with ethical practices will succeed in the long run.

### **c. What operational efficiencies and cost savings do electric vehicles offer to last-mile delivery providers, and how does ONE MOTO support businesses in transitioning to EV fleets?**

There are many commonly discussed and promoted efficiencies, such as savings on fuel, servicing, maintenance, downtime, and more. The ONE MOTO team supports our customers by understanding their reasons for transitioning, their operational models, and their servicing routines. Each sector and territory varies, and we show them how the switch will benefit their business and how to communicate this change to stakeholders.

### **4. Partnerships and Market Penetration**

#### **a. ONE MOTO has established strategic partnerships with battery manufacturers, charging infrastructure providers, and universities. How do these collaborations accelerate market penetration and innovation?**

I've said for years that collaborations are vital for business success, and we demonstrate this throughout our business. Aligning minds and missions for each party takes some navigation, but it's time well-invested. This approach allows us to deliver more effectively and achieve shared goals.

#### **b. Can you highlight a recent partnership that has been pivotal to ONE MOTO's expansion in key markets like the GCC or India?**

We have several exciting partnerships to announce over the next few months, both public and private, which have taken nearly a year to

structure. These partnerships are not only exciting for the parties involved but will also benefit the broader audience and government initiatives. One partnership I would like to mention is with Dubai International Chambers, which has been a long-standing advocate of ONE MOTO. Their support and endorsements have allowed us to achieve significant milestones, including presence across five continents.

### **5. Financing and Business Growth**

#### **a. In 2023, ONE MOTO raised \$190 million in asset financing to expedite the EV transition. How has this funding shaped your growth strategy, and what milestones have been achieved as a result?**

Many of our customers, especially 3PLs, don't have access to the capital needed to satisfy expansion demand, which is why we support them. This financing has increased trust and confidence within our customer base. Financiers aren't going to back just any company with that level of liquidity, and this has allowed our customers to access an electric fleet from ONE MOTO more affordably than a petrol fleet. As most fleet operators replace 25% of their fleets each year, these conversations are ongoing, and our customers have become our best marketers.

#### **b. Could you discuss how ONE MOTO's financing options make EV adoption more accessible for businesses, especially those in developing markets?**

A typical lease model for a petrol bike ranges between AED 500-600, including periodic maintenance (according to RTA guidelines). Financing for a ONE MOTO electric motorcycle is AED 470 on a lease-to-own model, which is beneficial for the operator's balance sheet. After the term ends, they have a fleet that operates on an almost pure profit model. Our Deliva (electric



**ONE MOTO**



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van) follows a similar model and is available at AED 3,700 per month. When finance and procurement teams calculate the Total Cost of Operation (TCO), they see the benefits clearly.

In other markets, we replicate the successful models we've developed in the UK and UAE to create similar offerings. If a gig-economy rider can only afford \$4 per day, we make it happen. If Rs 4,000 per month is feasible, we work with financiers to find a solution.

- c. **How do you foresee future funding rounds driving even larger expansions into markets like LatAm and Africa, where the need for sustainable transportation is growing?**



We've been mostly self-funded, aside from a crowdfunding round in 2020. Laying a solid foundation was a critical part of our roadmap to ensure longevity and achieve our vision. We are currently discussing our pre-Series A raise, a strategic decision focused on growth. Unlike many EV companies, we have quantifiable data and are raising only what we need to reach specific milestones. By validating all areas of our business—models, vehicles, team, and strategy—we offer our investors peace of mind and confidence in their investment. We are building a global brand and will work only with investors who can see the broader vision.

### 6. Sustainable Manufacturing and the Supply Chain

- a. **Sustainability is central to ONE MOTO's operations. How do you ensure that your manufacturing practices and supply chain processes reduce the overall carbon footprint?**

In January 2021, I set out a transparent ESG framework that our entire supply and value chain must adhere to. It did create some obstacles, but it also showed our commitment to

bringing change. We have 39 policies audited by Future Plus in the UK that help us set targets and actively work toward them. Currently, we positively impact 15 of the 17 UN SDGs. Not all companies have the manpower, resources, or knowledge to apply an ESG framework, so we help our customers and partners work towards these goals.

### 7. Technology and Innovation in EVs

- a. **ONE MOTO integrates the latest advances in electric propulsion and battery technology. How do you stay at the forefront of EV innovation, and what new technologies are you most excited about in the near future?**

Innovation versus incremental improvement is something we balance carefully. Spending too much time innovating can mean you aren't doing enough. Merely tweaking existing solutions doesn't differentiate you. What's needed versus what's nice to have? Of course, I can't dive into the details, but I can tell you it takes one dedicated team to ask the right questions and find the solutions.

- b. **What role does artificial intelligence or IoT play in enhancing the performance, safety, and user experience of ONE MOTO's vehicles?**

This is an interesting question, as we all know how technology and AI improve efficiencies. However, in last-mile delivery, not all stakeholders share this sentiment. While delivery aggregators see themselves as tech companies, their suppliers (3PLs) often remain analogue. Where it becomes interesting is in using telemetry to optimize productivity and fleet management. It improves delivery times, fleet utilization, driver safety, and the overall wellbeing of delivery teams. However, we're still exploring how to achieve mass adoption of telemetry without making stakeholders feel like they are bearing the cost.

### 8. EV Adoption and Policy Advocacy

- a. **ONE MOTO has been actively involved in engaging with policymakers and industry associations. What are some of the key policy changes you advocate for to accelerate EV adoption, particularly in the GCC?**

We advocate for policies that accelerate the transition to EVs by incentivizing businesses and

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consumers. There's an economic and environmental case for these incentives, and they benefit society at large.

### 9. Sustainable Finance and Digital Assets

- a. How is ONE MOTO leveraging sustainable finance or decentralized finance (DeFi) systems to support the expansion of electric mobility solutions in emerging markets?

This is one of the partnerships I've been working on, and it's a game-changer. However, I'll have to come back to you once it's officially announced!

- b. What are the biggest challenges and opportunities for using digital assets to fund sustainable transportation projects?

The challenge is tangible versus intangible assets. Financiers aren't all in the neo-financing mindset yet. But by applying well-known long-term asset financing principles to solar projects, we have a model that can also apply to EVs. Vehicles are typically depreciating assets, but we've proven that ONE MOTO isn't just any vehicle company. The challenge is in showcasing this opportunity, but once it's understood, the adoption flows naturally.

### 10. The Future of Electric Mobility and ONE MOTO's Vision

- a. Looking ahead, what emerging technologies or trends do you believe will most significantly reshape the electric mobility landscape over the next decade?

Our vision is clear: we aim to be a leading global mobility brand. Innovation is essential, but it's equally important to set strong foundations. Battery technology is rapidly evolving, which will drive adoption as it impacts the vehicle purchase price.

The larger issues, however, include the levies imposed on Chinese manufacturers. These manufacturers produce high-quality, affordable vehicles, but they haven't earned consumer, financier, or insurer trust. The European automotive industry will limit their long-term penetration. In terms of other forms of mobility—air, land, and sea—we must consider what's needed versus what's nice to have. For example, I don't believe delivery drones are necessary, but they could certainly aid in agricultural efficiencies.

Hydrogen will be considered for heavy machinery, but I also believe we'll soon see a new form of "fuel" introduced to the market.

- b. How does ONE MOTO stay ahead of technological trends while maintaining a commitment to sustainability and affordability?

Network, relationships, and focus are our keys. Our team stays on the pulse of trends, and we have senior members focused on the future. I think big—really big—but I'll reveal more on this at a later stage. Sustainability is integrated into our consciousness, so for example, we don't pay to exhibit at events as the carbon offset cost can be three times the price of exhibiting.

- c. What legacy do you hope ONE MOTO will leave in the global shift towards sustainable transportation, and what advice do you have for startups looking to make a meaningful impact in this space?

ONE MOTO aims to provide mobility for all—from low-income communities to major cities. Our vehicles are designed for last-mile mobility, and we hope to become the benchmark for how EV startups should have been structured. My advice is simple: know your customers, build with your customers and avoid selling to yourself emotionally. Stay lean, and remember you don't always need more money; sometimes, you just need a different strategy.

Stay hyper-focused and consider building a business with an exit in mind. Who would be your target buyer? IPO, trade sale, acquisition, or milestone wins? Each has merit. Align yourself with mentors who have wisdom in your field, and this experience will help you reach your goals. Lastly, if you feel you may have an ego, remove it immediately. You aren't that great, and the road you're on now will not be your final destination. Embrace that reality, and know that the team you're building will stand by you through whatever comes.





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# Net Zero Humanity's Vital Transition for a Sustainable Future



The planet stands at a crossroads. On one side is the unsustainable path of pollution, biodiversity loss, and climate disaster. On the other is a transformative opportunity: the journey to a net-zero future. A future where greenhouse gas emissions are balanced by the Earth's capacity to absorb them, where the health of our ecosystems and the stability of our climate are prioritized. Achieving net zero is not just an environmental necessity—it is an economic imperative and a moral obligation for safeguarding the planet and its future generations.

The transition to net zero requires urgent, coordinated global action to tackle the root causes of

environmental degradation, including air pollution, overconsumption of resources, climate change, and biodiversity loss. To meet the climate challenge, we must confront the interconnected crises head-on, adopting bold strategies that reduce carbon footprints and promote sustainable practices across all sectors of society.



## The Air Pollution Crisis: A Barrier to Net Zero

Air pollution is one of the greatest challenges standing between humanity and a sustainable, healthy future. It's a silent killer that robs millions of lives and accelerates the climate crisis. The World Health Organization (WHO) reports that 99% of the world's population breathes air that exceeds safe limits. 8.1 million people die prematurely each year due to air pollution, a toll far greater than that of tobacco, road traffic accidents, and other high-profile health crises combined.



## PIONEERING THE PATH TO NET ZERO

The largest contributors to air pollution are the burning of fossil fuels and biomass, responsible for 85% of global air pollution. These pollutants also profoundly impact global warming, contributing 50% of climate change through short-lived climate pollutants (SLCPs) such as black carbon and methane. Air pollution does more than just harm human health; it significantly impacts global economies. The World Bank estimates that the economic cost of air pollution is a staggering \$8.1 trillion annually, equivalent to 6.1% of global GDP. This cost stems from lost labour productivity, healthcare expenses, and the loss of human life. Addressing air pollution is vital to achieving a net-zero future, not only for health reasons but to avoid perpetuating these enormous economic losses.

### The Link Between Climate Change and Biodiversity Loss

The degradation of our ecosystems is inextricably linked to climate change. To limit warming and avoid catastrophic consequences, we must act on both fronts simultaneously: reducing emissions and protecting biodiversity.

Coral reefs, which sustain a quarter of all marine species, are among the ecosystems most at risk. If global temperatures rise beyond 2°C—as current trends suggest—coral reefs face extinction, and with them, the complex marine food webs they support. Already, 30% of marine biodiversity is at risk due to a combination of climate change, overfishing, and pollution. On land, the situation is equally alarming. Human activity has altered 75% of terrestrial ecosystems and 66% of marine environments. As a result, 1 million species are at risk of extinction, many due to habitat destruction and climate-induced changes in their environments. The ongoing resource drain, wherein humanity consumes resources at a rate equivalent to 1.7 Earths annually, is a major driver of deforestation, desertification, and species loss. Reversing this biodiversity crisis requires immediate, coordinated action to protect vital ecosystems, reduce resource consumption, and transition toward a more sustainable, net-zero economy. The urgency of this task cannot be overstated. Without action, the loss of biodiversity will continue to undermine the very ecosystems that support human life, from food production to clean water and air.

### The Economic Case for Net Zero: A Path to Resilience and Growth

Transitioning to a net-zero economy is not just a moral and environmental imperative—it is an economic opportunity. Inaction, on the other hand, comes at an enormous cost.

The OECD projects that 1.2 billion workdays are lost each year due to illnesses related to air pollution, and this number is expected to climb to 3.8 billion by 2060. These lost workdays cost economies globally, reducing labour productivity, tax revenues, and economic growth. In addition, the impacts of climate change, including extreme weather events such as hurricanes, floods, and droughts, continue to disrupt businesses, infrastructure, and supply chains.

Yet, investing in solutions that reduce air pollution, mitigate climate change, and promote sustainability offers remarkable economic returns. For instance, every \$1 invested in clean air initiatives results in \$30 in economic benefits, according to the U.S. Environmental Protection Agency (EPA). Similarly, investing in renewable energy, green technologies, and sustainable agriculture creates jobs, boosts productivity, and generates long-term economic benefits.

The opportunity to simultaneously tackle climate change, reduce pollution, and foster economic growth through a net-zero transition is unparalleled. The global economy can not only recover from the damage caused by pollution and climate change but also build greater resilience and prosperity by embracing sustainable practices.

### The Warming World: Racing Toward 1.5°C

The world is warming at an unprecedented rate. According to the Intergovernmental Panel on Climate



Change (IPCC), global temperatures have already risen by 1.2°C above pre-industrial levels. At 1.5°C, the impacts of climate change will become far more severe, with irreversible damage to ecosystems, agriculture, and infrastructure.

The window for limiting global warming to 1.5°C is rapidly closing. The time to act is now. Every fraction of a degree matters. The Paris Agreement sets a clear goal: to limit global warming to well below 2°C and strive for 1.5°C. To achieve this, we must reduce global emissions by at least 45% by 2030 and reach net-zero emissions by 2050.





## PIONEERING THE PATH TO NET ZERO

### Short-Lived Climate Pollutants: Low-Hanging Fruit for Rapid Action

While carbon dioxide (CO<sub>2</sub>) receives the most attention in the fight against climate change, there are other pollutants that contribute significantly to global warming. Short-lived climate pollutants (SLCPs), including black carbon, methane, and hydrofluorocarbons (HFCs), are responsible for nearly 50% of current global warming. These pollutants have a much shorter atmospheric lifetime than CO<sub>2</sub> but pack a much stronger warming punch.

By targeting SLCPs, we can achieve rapid, measurable reductions in global warming. According to the Proceedings of the National Academy of Sciences (PNAS), eliminating SLCPs could reduce global temperatures by 0.5°C by 2050. Key measures include phasing out diesel engines, reducing methane leaks from oil and gas infrastructure, and eliminating agricultural burning.

Focusing on SLCPs provides a unique opportunity to achieve short-term climate benefits while simultaneously improving air quality and public health.

### Achieving Net Zero: Solutions and Strategies

To achieve a net-zero future, global efforts must focus on the following key strategies:

1. Transition to Clean Energy: Rapidly shift from fossil fuels to renewable energy sources like wind, solar, and hydropower. This includes decarbonizing the power sector, which accounts for 25% of global emissions.
2. Energy Efficiency: Increase energy efficiency in all sectors—buildings, transportation, and industry—by adopting new technologies and improving infrastructure. This can reduce global energy demand and emissions substantially.
3. Sustainable Agriculture and Land Use: Promote sustainable farming practices, restore degraded ecosystems, and protect critical habitats. Agriculture is responsible for 24% of global greenhouse gas emissions; transforming this sector is essential for achieving net zero.
4. Carbon Capture and Storage: Invest in technologies that capture and store CO<sub>2</sub> emissions from industries and power plants. These technologies will play a critical role in offsetting emissions that are difficult to eliminate.
5. Circular Economy: Shift from a linear "take-make-dispose" model to a circular economy, focusing on resource efficiency, reuse, and recycling. This can help reduce waste and the consumption of raw materials, contributing to overall sustainability.
6. Policy and Global Cooperation: Strengthen international climate agreements and ensure robust climate policies at the national level. Achieving net zero requires coordinated global efforts, with countries committing to more ambitious climate goals under frameworks like the Paris Agreement.

international climate agreements and ensure robust climate policies at the national level. Achieving net zero requires coordinated global efforts, with countries committing to more ambitious climate goals under frameworks like the Paris Agreement.

### The Road to Net Zero: Economic Benefits and Sectoral Transformation

As the global economy moves toward net zero, the transition offers unparalleled opportunities for sustainable economic growth, innovation, and resilience. However, the failure to act swiftly and decisively will come at an enormous cost, both environmentally and economically. The climate crisis is not just a series of isolated events—it is a systemic challenge that permeates all sectors of society. Here's a closer look at how various sectors need to transform to achieve net-zero emissions and what's at stake if we delay action.

### The Cost of Inaction: A Dire Economic Forecast

The economic consequences of inaction are staggering. If the world continues on its current trajectory, we can expect dramatic losses in agricultural productivity, health outcomes, infrastructure resilience, and economic stability. These costs will disproportionately affect the poorest and most vulnerable communities, deepening inequalities. The OECD warns that climate-related disasters could force 200 million people to migrate by 2050, placing further strain on global resources and leading to more severe geopolitical tensions.

According to the World Bank, the cost of air pollution alone is estimated at \$8.1 trillion annually or 6.1% of global GDP. Beyond the health costs, lost productivity, and rising infrastructure damage, delaying the transition to a cleaner, more sustainable economy will hinder global growth and well-being for decades to come. Therefore, the economic case for investing in net-zero solutions becomes even more compelling—every dollar spent on climate action generates \$30 in economic benefits, as noted by the U.S. EPA. This return on investment is the type of opportunity that should guide our global response to the climate crisis.

### The Energy Transition: Powering a Net-Zero Future

Energy is the cornerstone of the net-zero transition. The energy sector is responsible for around 73% of global greenhouse gas emissions, with fossil fuel combustion remaining the primary driver of both global warming and air pollution. The good news is that renewable energy technologies—solar, wind, hydropower, and geothermal—are more cost-

## PIONEERING THE PATH TO NET ZERO



effective than ever before. As renewable energy costs continue to decline, transitioning to clean power sources is increasingly becoming a financial advantage.

The International Renewable Energy Agency (IRENA) reports that the transition to renewable energy could create 85 million new jobs globally by 2030, with \$10 trillion in cumulative economic gains. Beyond job creation, the clean energy transition will reduce reliance on volatile fossil fuel markets, enhance energy security, and drive innovation in new energy storage and distribution technologies.

Achieving net-zero emissions by 2050 in the energy sector will require governments to enact stronger policies and incentives, such as carbon pricing, subsidies for clean energy, and investment in green infrastructure. Energy efficiency improvements—both in electricity generation and consumption—will be crucial to reducing overall demand. The International Energy Agency (IEA) estimates that energy efficiency could contribute to 40% of the required emissions reductions by 2050, making it a critical tool for achieving net zero.

### Decarbonizing Industry: A Tall Order but a Transformative Opportunity

The industrial sector is responsible for 21% of global emissions. The decarbonization of industries such as steel, cement, chemicals, and transportation is a daunting challenge. However, it is not impossible. Innovations such as green steel, which uses hydrogen instead of coke for the smelting process, and carbon capture and storage (CCS) technologies are emerging as key solutions to reduce emissions from heavy industries.

The transition to sustainable practices within industries will require substantial investment in new technologies, infrastructure, and clean alternatives. For example, the cement industry, which alone accounts for about 8% of global emissions, is exploring the use of alternative fuels, low-carbon

cement mixes, and carbon capture technologies to reduce its carbon footprint.

Similarly, the shipping and aviation industries, which together account for 15% of global transport emissions, are investing in alternative fuels, such as biofuels and electric propulsion, to replace their reliance on fossil fuels. Governments must incentivize these innovations, making low-carbon technologies more competitive against traditional, polluting methods. For an industry to reach net zero, policy incentives, research and development, and the adoption of circular economy principles—which promote the reuse and recycling of materials—will be pivotal.

### Agriculture and Land Use: Restoring Balance

Agriculture and land use change contribute around 24% of global greenhouse gas emissions, with the majority of emissions coming from deforestation, livestock production, and the use of synthetic fertilizers. Achieving net zero will require a significant transformation of food systems, transitioning to sustainable farming practices that reduce emissions, restore soil health, and preserve ecosystems.

Sustainable agriculture includes practices such as regenerative farming, which enhances soil carbon sequestration, and precision agriculture, which reduces the use of harmful chemicals and optimizes resource use. These methods can help reduce the need for fertilizers and pesticides, lower methane emissions from livestock, and restore soil health, thus helping absorb more carbon dioxide.

Additionally, tackling deforestation—which accounts for around 10% of global emissions—is essential. Reforestation and afforestation efforts, combined with stronger protections for existing forests, are necessary to offset emissions. The UN Food and Agriculture Organization (FAO) reports that sustainable land management practices, combined with forest conservation, could reduce global emissions by up to 4 gigatons of CO<sub>2</sub> per year by 2050.

The push for a net-zero agriculture sector will require large-scale adoption of climate-smart practices, government incentives, and changes to consumer diets, such as reducing meat consumption, which contributes significantly to agricultural emissions.

### The Circular Economy: Reducing Waste, Creating Value

Achieving net zero is not just about reducing emissions but also about changing the way we produce, consume, and dispose of goods. The concept of a circular economy, which focuses on reusing, recycling, and reducing waste, will play a critical role in achieving net-zero emissions.

## PIONEERING THE PATH TO NET ZERO

Currently, global consumption patterns exceed what the planet can sustainably provide. Humanity consumes resources equivalent to 1.7 Earths annually. This unsustainable consumption, driven by a “take-make-dispose” model, leads to the depletion of natural resources and the accumulation of waste, much of which ends up in landfills or pollutes ecosystems.

In a circular economy, products are designed for durability, repairability, and recyclability, reducing the need for raw materials and minimizing waste. Transitioning to a circular economy could cut global carbon emissions by 39% by 2030, according to the Circular Economy Action Plan by the European Commission.

Key strategies include reducing single-use plastics, implementing extended producer responsibility (EPR) programs, and encouraging businesses to adopt cradle-to-cradle design principles.

### Transport: Electrification and Sustainable Mobility

The transport sector accounts for 16% of global emissions, with road transport alone contributing nearly 11%. The transition to a net-zero transport system involves the electrification of vehicles, the adoption of sustainable fuels, and the promotion of public transit systems.

The widespread adoption of electric vehicles (EVs) will be crucial in decarbonizing the transport sector. The International Transport Forum (ITF) projects that, by 2030, electric vehicles could account for up to 60% of global car sales, with governments pushing for tighter emissions standards and more robust EV infrastructure. Investment in public transport, cycling infrastructure, and sustainable urban mobility will also reduce the reliance on personal cars, cutting both emissions and traffic congestion.

### Net Zero and the Role of Policy and Global Cooperation

Achieving net zero by 2050 requires global cooperation, cross-sector collaboration, and strong policy frameworks. The Paris Agreement laid the groundwork for collective action, with countries committing to limit global warming to 1.5°C above pre-industrial levels. However, achieving these ambitious goals will require enhanced national policies, financial investments, and international cooperation. Carbon pricing mechanisms, such as carbon taxes and cap-and-trade systems, can provide strong economic incentives to reduce emissions. International financing mechanisms will also be essential to support the transition of developing countries, which are often the most vulnerable to the impacts of climate change.

### A Global Moment of Reckoning

The journey to net zero is not a choice—it is a necessity. The consequences of inaction will be catastrophic, from worsening health outcomes to escalating environmental destruction and profound economic costs. However, the path to a net-zero world is filled with opportunity: by transitioning to a cleaner, more sustainable economy, we can safeguard the future of the planet and its inhabitants.

The clock is ticking. The transition to net zero must happen now. The solutions are available, the economic benefits are clear, and the consequences of waiting are too great. It is time for global leaders, businesses, and individuals to act decisively and begin the vital journey toward a sustainable, net-zero future.



**NETWORK NOW  
BOASTS OVER 7,000  
COORDINATORS FROM  
175 COUNTRIES,  
ALL WORKING TOGETHER TO  
EMPOWER INDIVIDUALS AND  
COMMUNITIES TO ADDRESS  
CRITICAL ISSUES LIKE  
CLIMATE CHANGE  
AND SUSTAINABILITY.**



**Dr Renuka Thakore**  
Founder & CEO  
Global Sustainable Futures Network CIC

#### 1. Your Journey & Vision

**Can you share with us the story behind the founding of Global Sustainable Futures: Progress through Partnership Network?**

The founding of the Global Sustainable Futures: Progress through Partnership (GSF) Network was driven by the vision of creating an inclusive, free, and transparent platform where early career researchers and professionals could collaborate globally on sustainability challenges. What began with a small group of researchers from Brazil seeking to connect on sustainable development soon grew into a global initiative. With researchers from Africa and beyond joining, the network now boasts over 7,000 coordinators from 175 countries, all working together to empower

individuals and communities to address critical issues like climate change and sustainability.

My leadership in this voluntary initiative is motivated by a deep passion for humanity and sustainable development. Over the years, receiving global recognitions such as the "Development Leadership: Governor Enrique Tomás Cresto Award 2022" and the "Global SDG's Women Ambassador Award 2022" has validated the work we do and provided further motivation to advance our mission. These awards, including the upcoming 'Humanitarian Award Global (HAG)' in October 2024, serve as a reminder of the global impact of our efforts and the importance of continuing to push forward.

COP 16 CBD in Cali, Colombia, and COP16 on desertification in Riyadh, Saudi Arabia, have amplified our efforts in these critical global forums, making it essential to further strengthen our initiatives. To date, GSFN has secured four grants,

produced five publications, and published a book focused on sustainable and innovative practices and policies, emphasizing the essential role of citizens, science, and environmental stewardship. Each milestone marks progress toward realizing a more sustainable and equitable future for all, as we continue to drive collective action on a global scale.

### 2. Climate Adaptation, Resilience & Just Transition

**Could you share a success story from your work that demonstrates the potential of collaborative action?**

One of the most significant success stories from my work that demonstrates the potential of collaborative action is our adaptation program in Kenya, launched in partnership with the Mara Basin Conservation NGO. This initiative, which spans all 47 counties, focuses on empowering local communities to develop and implement climate adaptation strategies tailored to their unique challenges. By working closely with local stakeholders, this program has provided a pathway for sustainable solutions that address the immediate climate risks faced by vulnerable populations. The collaboration has resulted in improved community resilience, showcasing how localized partnerships can drive real change and create long-term impact.

The success of this program is rooted in the power of collaboration. By engaging local NGOs, community leaders, and stakeholders, we ensured that the adaptation strategies were culturally relevant and grounded in local knowledge. This bottom-up approach allowed us to develop targeted interventions that directly addressed the needs of the communities involved. For example, early-warning systems for floods and droughts were tailored to the specific environmental challenges of each county, while training programs helped farmers adapt to changing weather patterns and implement sustainable agricultural practices. This localized, collaborative action has led to measurable improvements in climate resilience and resource management, benefitting thousands of individuals across Kenya.

Another success story comes from our Philippines partnership, where we collaborated with a university to deliver educational workshops on sustainable practices. This project not only engaged students in meaningful dialogue about climate action but also resulted in the publication of a book based on the workshop's outcomes. This book continues to serve as a resource for educators and policymakers, extending the impact of our work beyond the immediate participants and fostering a culture of sustainability in the region.

In Egypt, our EmpowerHER project exemplifies the power of collaborative action in advancing gender equity within the STEM fields. Through workshops, mentoring programs, and skill-building initiatives, we've empowered women to pursue careers in science and technology, helping bridge the gender gap in these traditionally male-dominated fields. The success of this initiative highlights how targeted collaborations can create opportunities for marginalized groups and contribute to more inclusive growth.

Across these projects, the underlying theme is that true success in climate adaptation and resilience comes from partnerships that recognize the strengths and needs of local communities. Whether it's in Kenya, the Philippines, or Egypt, collaborative action has proven to be a powerful tool for driving sustainable development and ensuring that vulnerable regions can thrive in the face of climate challenges.

### 3. Transdisciplinary Approaches & Systems Thinking

**Systems thinking is increasingly being recognized as vital in addressing complex sustainability issues. How do you incorporate**



**this approach in the partnerships and initiatives you lead? Can you provide an example where systems thinking has led to a breakthrough in achieving sustainable development goals?**

Transdisciplinary collaboration is another key area of your work. Why is it critical to bring together diverse disciplines, sectors, and regions to tackle global sustainability challenges? Could you share a particular instance where this approach produced significant results?

I am a strong advocate of systems thinking, which is essential for addressing complex sustainability challenges. My understanding of this approach





developed during my PhD, where I created a stakeholder engagement model for energy efficiency and sustainability. This model explored how individuals, organizations, and networks interact, and how values linked to outcomes influence multidisciplinary sustainability efforts, aligning with various Sustainable Development Goals (SDGs).

In my work, systems thinking guides how I approach partnerships and initiatives. Every individual in our network interacts with non-human actors such as technologies, regulations, and institutions, shaping how we address sustainability. This holistic lens allows us to adapt our strategies while maintaining a cohesive framework for collaboration. By examining how different parts of the system influence one another, we can address sustainability challenges more effectively and consider the broader impact of each decision.

One breakthrough where systems thinking played a pivotal role was the development of a collaborative framework for energy efficiency within organizations. This approach enabled more efficient energy use while aligning multiple sustainability objectives. The model helped organizations not only meet their sustainability targets but also better understand the interdependence between various actors, leading to more impactful climate action.

A notable example of systems thinking in action is our EmpowerHER Egypt project, where we brought together experts from STEM, social sciences, IT, finance, and regulation. This transdisciplinary collaboration ensured that solutions addressed the needs of all stakeholders while balancing economic, social, and environmental sustainability. Without such an integrated approach, the project would have struggled to meet the diverse challenges it aimed to address.

Through systems thinking, we ensure that our sustainability efforts are holistic, minimizing unintended consequences and promoting comprehensive, long-term solutions.

#### 4. The Role of Technology, Skills, & Education

**Education plays a fundamental role in empowering communities and fostering climate resilience. How do you envision educational programs, especially in the Global South, contributing to the global sustainability agenda?**

Education plays a pivotal role in empowering communities and fostering climate resilience, particularly in the Global South. To contribute effectively to the global sustainability agenda, educational programs must be designed to meet local needs while preparing individuals to tackle global climate challenges.

Rather than relying on traditional, formal educational systems that can be expensive and inaccessible, we need flexible, inclusive models that provide practical knowledge and skills. For example, teaching sustainable farming, water conservation, and renewable energy solutions equips individuals to address local environmental and economic challenges.

Technology can also expand access to education, but it must be sustainable, adaptable, and designed for longevity. Instead of introducing short-lived innovations, we should focus on tools and resources that evolve with future needs while minimizing environmental impact.

Moreover, educational programs should emphasize practical skills that foster innovation and problem-solving, enabling communities to build climate resilience from within. By integrating these elements—sustainable technology, practical training, and accessible education—communities in the Global South can contribute meaningfully to global sustainability efforts. Ultimately, education is key to empowering individuals to create lasting solutions and adapt to the complexities of climate change, ensuring a more sustainable future for all.

#### 5. Co-Creation & Shared Values

**Can you provide an example of a project where co-creation between diverse stakeholders led to a particularly impactful outcome? What lessons were learned from that experience?**

At Global Sustainable Futures Network (GSFN), we emphasize co-creation and collaboration between diverse stakeholders to achieve impactful sustainability outcomes. One of our most successful examples of this approach was the development of a cultural leadership framework that recognizes the unique contributions of individuals from different sectors, fostering a shared culture of sustainability.

Our model encourages individuals to contribute based on their strengths and passions, without demanding additional efforts beyond what they are already doing. We ask members to identify their focus on specific Sustainable Development Goals (SDGs), select their domain (education, research, enterprise, or community), and share descriptive words that best capture their activities. This simple yet effective method helps us understand each person's expertise and encourages collaborative engagement. A notable success story emerged from our GSFN Annual Conference, where we awarded individuals based on their self-nomination of completed activities, whether through formal work or voluntary efforts. Over the past three years, we have given out over 500 awards, recognizing

contributions across various fields and sectors. This award system, which includes Bronze, Silver, Gold, and Platinum Awards, has created a strong sense of community and mutual recognition within the network, reinforcing collaboration.

Through this co-creation model, stakeholders from academia, industry, and local communities have worked together on projects such as sustainable education in the Philippines and empowering women in STEM fields in Egypt. The key lesson learned is that by recognizing and valuing each participant's contributions, we build a collaborative, empowering environment that accelerates progress toward sustainability goals.

This approach demonstrates that co-creation, driven by mutual respect and recognition, is vital in mobilizing diverse stakeholders for impactful, sustainable development outcomes.

### 6. Looking Ahead: The Future of Sustainability

#### Following COP29, what priorities and strategies should guide global efforts to build a sustainable and inclusive future?

The outcomes of COP29 highlight critical priorities and strategies to advance global sustainability efforts. One key focus is fostering collaboration across sectors and disciplines to align stakeholders on actionable pathways. Developing scalable solutions through partnerships and inclusive dialogue ensures that progress remains both ambitious and achievable. "COP29 reaffirmed that progress toward sustainability requires diverse approaches," noted Dr. Renuka Thakore, Founder and CEO of GSFN. "From localized efforts to global commitments, every step contributes to the larger goal."

Another significant takeaway is the importance of equitable frameworks that respect diverse perspectives. Time-tested practices, particularly those rooted in community knowledge, were recognized for their value in addressing resilience and resource management challenges. Creating platforms for knowledge sharing and co-creation can bridge gaps between policymakers and underrepresented groups, fostering more holistic and effective strategies.

Ensuring inclusivity in economic transitions is equally crucial. Policies should aim to balance environmental goals with socioeconomic equity, reinforcing the interdependence of sustainable development and justice. Finally, capacity building through education and skills development remains a cornerstone of long-term progress. Equipping individuals and communities with tools for innovation and adaptation empowers them to actively participate in shaping a

sustainable future. GSFN's ongoing initiatives in this area are paving the way for more widespread adoption of green practices, ensuring systemic change that endures beyond short-term goals.

The priorities identified at COP29 provide a roadmap for transformative action, with collaboration, inclusivity, and empowerment as its guiding principles.

What were the critical themes explored at COP16 UNCCD in Riyadh, and how did they address the challenges of land degradation and sustainable development?

COP16 UNCCD in Riyadh brought significant attention to the urgent challenges of land degradation and desertification, exploring themes that emphasized innovative approaches and global collaboration. The conference highlighted the importance of addressing these issues not only to restore environmental health but also to safeguard livelihoods, enhance food security, and build resilience against climate change.

One prominent focus was on utilizing innovative technologies, such as transforming sandy soils into fertile land capable of supporting vegetation growth. These solutions demonstrated the potential for scalable, rapid responses to combat desertification. The event also underscored the necessity of sustainable land-use practices and effective management strategies to slow land degradation and promote long-term environmental sustainability.

Another critical theme was the integration of indigenous knowledge and local practices into land restoration strategies. By combining traditional wisdom with modern technological advancements, COP16 highlighted how inclusive solutions can be more effective in addressing complex environmental challenges.

The Global Sustainable Futures Network (GSFN) actively engaged in these discussions, contributing to dialogues that emphasized collaboration between grassroots communities, policymakers, and innovators. The conference reinforced the importance of interdisciplinary efforts and knowledge-sharing to develop and implement solutions that are both equitable and impactful.

The insights and connections from COP16 will continue to shape strategies for combating desertification and advancing sustainable development, paving the way for stronger global partnerships and innovative action.

### 7. Personal Reflections

As a global leader in sustainability, what keeps you motivated in your efforts, despite the challenges?





As a global leader in sustainability, what motivates me most is my mission to provide opportunities for all, ensuring that no one is left behind. This mission is deeply personal, driving everything I do. Each day, I receive inquiries from individuals seeking guidance and solutions to their unique challenges. These requests, whether they come from different disciplines, sectors, or regions, fuel my creativity and inspire me to develop innovative solutions that can truly impact their lives.

I advocate for a demand-led approach, where the needs of those I serve remain at the centre of my efforts. Surrounded by a diverse network of multidisciplinary, multisectoral, and multinational individuals, I am constantly inspired by the variety of challenges and perspectives they present. It is

humbling to know that people trust me to help them find solutions, and this trust, coupled with my approachability, motivates me further. I recognize the privilege of playing a role in their success and contributing to positive, sustainable change.

For emerging leaders in the sustainability space, my advice is to stay connected to the people you serve. Be open, listen intently, and let their needs guide your actions. Resilience in the face of challenges is essential; always remain adaptable, creative, and solution-oriented. Trust and collaboration are key—engaging with those around you will provide the strength and motivation to keep pushing forward. Together, we can drive meaningful progress toward a more sustainable and equitable future.

# BEYOND TRACEABILITY

Enhancing the Global Supply Chain  
Sustainability from Seed to Table



Supply Chain  
Mapping and  
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Transactional  
Traceability



Land Use  
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Legality  
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Supply  
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Jindal Steel is committed to achieving net-zero emissions by 2047. Through investments in solar, wind, and green hydrogen, backed by an MOU with Jindal Renewable Power, we are driving low-carbon innovations. Our focus on CCUS and reducing coal based energy use by 50% is setting new standards for a low carbon emission steel.



#### **Jindal Renewables:** Decarbonizing Hard-to-Abate Sectors with Clean Energy Solutions

##### Leading the Charge in Decarbonisation

Jindal Renewables is committed to becoming a pioneering force in India's renewable energy sector. With nearly 3 GW of diverse renewable assets currently under development and secured power off-take agreements, the company is on track to expand its portfolio to approximately 12 GW by 2030. Jindal Renewables aspires to be one of India's largest providers of decarbonisation solutions.

Jindal Renewables' impact extends beyond its own operations, initiating positive changes that benefit communities, the economy, and the planet:

- **Cleaner Planet:** Through substantial carbon emission reductions, Jindal Renewables supports a healthier planet and contributes to mitigating the impacts of climate change.
- **Enhanced Sustainability:** Emphasizing responsible resource management, the company is committed to safeguarding the

environment for future generations.

- **Improved Public Health:** By reducing air pollution, Jindal Renewables aims to promote healthier communities with improved air quality.
- **Economic Competitiveness:** As part of the global shift toward clean energy, Jindal Renewables is driving a sustainable, prosperous economy for the long term.

#### **Renewable Energy Solutions**

- **Solar Power:** With a strong commitment to solar energy, Jindal Renewables leverages abundant solar resources to foster a cleaner future.
- **Wind Energy:** Innovating within wind power generation, the company captures wind energy for a stable, clean power source.
- **Pumped Storage Projects (PSP):** Jindal Renewables pioneers energy storage solutions through PSPs to maintain a steady, reliable power supply, regardless of variations in weather.

## LEADING INDIA'S GREEN ENERGY REVOLUTION

5

- Future Capacity: Jindal Renewables has set a goal to reach 15 GW of renewable energy capacity by 2030, underscoring its commitment to India's sustainable energy transformation.

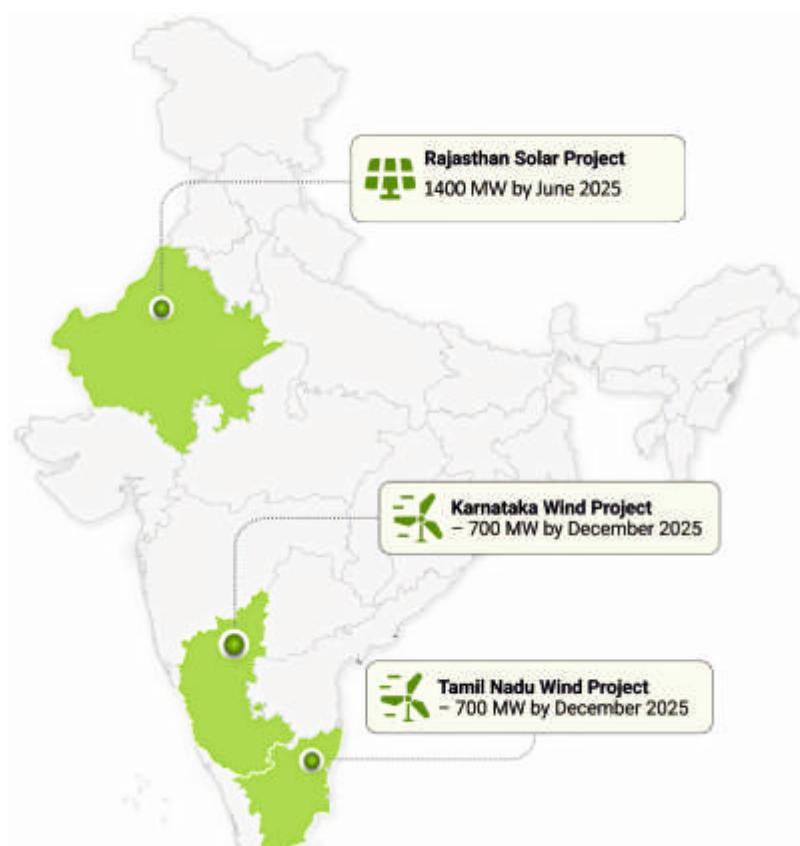
### Phase I Execution Map for 2800 MW

Jindal Renewables is utilizing the Inter-State Transmission Network (ISTS) to connect all generation projects. The Angul plant in Odisha is already linked to the ISTS, and efforts are underway to connect the Raigarh plant in Chhattisgarh.

A Vision for Sustainable Growth and Healthier Communities

Jindal Renewables is determined to reshape India's energy landscape with a target of 15 GW of renewable energy by 2030. This vision addresses not only India's energy needs but also fosters a sustainable, cleaner future with key initiatives:

1. Reducing Fossil Fuel Dependence: Supporting a secure, sustainable energy future.
2. Combating Climate Change: Reducing greenhouse gas emissions to positively impact global warming.
3. Healthier Environment: Enhancing air quality for a better quality of life.
4. Boosting Economic Growth: Spurring innovation and job creation within the renewable energy sector.



**CARBONEX PROVIDES FARMERS WITH THE  
TOOLS AND KNOWLEDGE NEEDED TO  
PRACTICE CARBON FARMING, WHICH  
SEQUESTERS CARBON IN THE SOIL.**



**1. Career and Background**

- a. What inspired you to combine your background in chemistry and innovation management with sustainability?**

Growing up in Nigeria, I was fascinated by the potential of science to solve real-world problems. One of my early projects as a child involved creating a mini power backup system from batteries for my parents, which inspired me to pursue green solutions that address climate challenges. As I progressed through my academic and professional journey, particularly in chemistry, I realized that combining my scientific knowledge with innovation management could help create scalable, impactful solutions for sustainability. This realization fueled my work in green technology and led to the founding of CarbonEx, where we bridge the gap between environmental conservation and economic opportunities.

- b. How did your experiences at Dangote Cement and Climax Lubricants influence your leadership style and problem-**

**solving approach at CarbonEx?**

My time at these companies instilled in me the importance of operational efficiency, strategic thinking, and resilience in business. Working in high-stakes industrial environments allowed me to develop a keen sense of managing large-scale projects, which has been invaluable in building CarbonEx. These experiences have shaped my ability to lead diverse teams, manage resources effectively, and drive innovation in a field as critical as sustainability.

- c. Could you tell us about the founding of Isunder Technology and how it paved the way for CarbonEx?**

The foundation of Isunder Technology was driven by my deep interest in clean energy, particularly electric vehicle technology. At the time, I was focused on tackling the limitations that hindered electric vehicle adoption to promote widespread use of electric mobility, which directly contributes to the decarbonization of the transport sector. I worked on an efficient electric motor design, the

## EMPOWERING FARMERS FOR CARBON-NEUTRAL FUTURES

Switched Mode Power (SMP) electric motor, aimed at addressing the issue of range anxiety in electric vehicles. This project not only garnered global recognition for me but also laid the groundwork for CarbonEx by reinforcing my commitment to innovation-driven sustainability. The lessons learned at Isunder regarding clean tech solutions translated into CarbonEx's mission of leveraging technology to combat climate change.

### 2: Transition into Sustainability

#### a. What were the key motivators behind your shift towards green technology and carbon sequestration?

My motivation stems from a lifelong passion for science and a deep-rooted concern for the environment. Growing up in Nigeria, I witnessed firsthand the effects of environmental degradation, agricultural decline, and energy insecurity. My early experiments in creating green solutions, such as a battery-powered backup system, laid the foundation for my pursuit of more sustainable technologies. The urgency of addressing climate change, combined with the potential to improve lives by empowering communities through carbon farming and other carbon savings initiatives, compelled me to shift towards green technology and carbon sequestration. I recognized the need for innovative solutions to combat environmental challenges while creating economic opportunities, which inspired the formation of CarbonEx.

#### b. How has your academic and professional background helped shape the innovative direction of CarbonEx?

My background in chemistry provided me with the scientific foundation to understand environmental processes and the impacts of carbon emissions, while my experience in innovation management has been crucial in translating that knowledge into scalable, practical solutions. Working on clean technology projects, such as the SMP electric motor for electric vehicles, gave me a strong understanding of energy efficiency and carbon reduction. This combination of academic insight and hands-on project development has been instrumental in shaping CarbonEx's innovative approach, leveraging digital tools like satellite remote sensing and machine learning for environmental carbon reduction.

#### c. Can you discuss some key leadership

#### lessons learned while leading multiple teams and projects?

One key lesson I've learned is the importance of adaptability—each project and team is unique, and as a leader, you must be flexible in your approach. Another lesson is the value of clear communication and collaboration. Ensuring that all team members understand the vision and have the resources to succeed is crucial. I've also learned that leadership requires patience and resilience, especially when tackling complex challenges like climate change. Trusting the team, empowering them to innovate, and being open to learning from failures are all essential parts of the leadership journey that has shaped my work at CarbonEx.

### 3: CarbonEx and Technology Innovations

#### a. How does CarbonEx empower farmers to participate in carbon markets, and what are the tangible benefits for them?

CarbonEx provides farmers with the tools and knowledge needed to practice carbon farming, which sequesters carbon in the soil. Through our platform, we measure the amount of carbon savings or reductions achieved through these practices and sell the resulting carbon credits on global carbon markets, creating a new revenue stream for farmers. The tangible benefits include increased farm productivity, improved soil health, and financial rewards from sustainable practices, contributing to both economic development and climate change mitigation.

#### b. How does your carbon farming initiative help improve soil health and increase agricultural productivity?

Our carbon farming initiative focuses on regenerative practices such as agroforestry, crop rotation, and cover cropping, which help restore soil fertility. These practices enhance the soil's ability to retain water and nutrients, leading to healthier crops and higher yields. This directly impacts food security while also reducing the carbon footprint of agriculture.

#### c. How do you ensure the scalability of CarbonEx's technologies to support more farmers across Nigeria and Africa?

Scalability is central to our platform's design. We use satellite remote sensing and machine learning to monitor large areas of farmland, allowing us to extend our solutions across regions. Additionally, our partnerships with organizations like the Global Sustainable Futures Network (GSFN) and the Nigerian



## EMPOWERING FARMERS FOR CARBON-NEUTRAL FUTURES



Communication Satellite Company Limited have helped us reach more farmers and amplify our impact. While we are currently based in Nigeria, we plan to scale our initiatives to other countries across Africa.

### 4: Digital Monitoring and Trading of Carbon Credits

#### a. Could you explain how CarbonEx's patented DMVRT methodology works and how it ensures transparency in carbon credit tracking?

The DMVRT (Digital Measuring, Verification, Reporting, and Trading) methodology integrates satellite remote sensing, machine learning, and ground data collection to track carbon sequestration activities across various vegetations. This system provides real-time data on carbon levels across large-scale agricultural or forestry projects. By using machine learning to process satellite imagery, we can accurately measure the amount of carbon stored in vegetative lands, ensuring that each carbon credit generated is verified and traceable. The DMVRT system creates a transparent link between carbon sequestration sources and their end points with buyers in the global carbon market, ensuring trust and accountability.

#### b. How do you integrate satellite remote sensing and machine learning into carbon monitoring and reporting?

We use satellite imagery to continuously monitor spatial carbon distribution across vegetation. Machine learning algorithms analyze these images to estimate carbon sequestration levels, enabling us to track carbon storage without requiring constant on-site visits, which enhances scalability. This technology also allows us to produce detailed reports that validate the amount of carbon stored, a critical component for issuing and trading carbon credits accurately.

#### c. What are some of the challenges you face in implementing these advanced technologies on vegetative lands, and how do you overcome them?

One key challenge is data variability due to weather conditions, which can obscure satellite imagery. We address this by using high-resolution satellite data capable of penetrating cloud cover and by supplementing it with ground-level data to fill any gaps. Another challenge is ensuring that local farmers and landowners feel comfortable with the technology. To overcome this, we provide education and training to help them understand

the benefits of our monitoring system and how it can enhance their farming practices and livelihoods.

### 5: Clean Energy Initiatives

#### a. How do smart cookstoves align with your overall mission of reducing household emissions?

Smart cookstoves are a natural extension of our mission to reduce carbon emissions while improving livelihoods. Traditional cooking methods, which rely on wood or charcoal, contribute significantly to deforestation and household air pollution. By introducing smart cookstoves that use cleaner fuels and burn more efficiently, we help reduce these emissions. This aligns with our broader goal of addressing climate change through sustainable solutions that also improve health outcomes in rural communities.

#### b. How do these initiatives contribute to both climate change mitigation and health improvement in rural communities?

In addition to reducing carbon emissions, smart cookstoves significantly lower indoor air pollution, which is a major cause of respiratory diseases in rural areas. By decreasing the need for firewood, these stoves also help alleviate deforestation pressures, contributing to environmental conservation. This dual impact on climate change mitigation and health improvement makes smart cookstoves an essential part of our clean energy strategy, especially in communities that rely heavily on traditional biomass for cooking.

#### c. What are the next steps for CarbonEx in the clean energy space?

The next steps for CarbonEx involve expanding our clean energy solutions to include tracking carbon for solar energy systems aimed at rural electrification, as well as clean transport initiatives. We plan to offer comprehensive energy packages to communities that can benefit from cleaner, more sustainable energy sources. Our goal is to promote the adoption of these technologies within these communities, further reducing carbon emissions from these sectors.

### 6: Partnerships and Scaling Impact

#### a. How have partnerships with organizations like the Global Sustainable Futures Network (GSFN) and NIGCOMSAT contributed to CarbonEx's growth?

Partnerships with organizations like GSFN and

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NIGCOMSAT have been crucial for scaling our impact. GSFN has provided invaluable expertise and resources in sustainable farming practices and the establishment of carbon baselines for onboarded farmers, helping us connect them with international carbon markets. Meanwhile, NIGCOMSAT has enhanced our capabilities by providing satellite technology that allows for precise monitoring of carbon sequestration activities. These collaborations have accelerated our ability to deliver reliable and scalable solutions to rural communities and businesses alike.

**b. Can you share insights into how these collaborations help you scale your initiatives and provide more support to rural communities?**

These collaborations grant us access to technology and expertise that would otherwise be out of reach. Through GSFN, we have extended global best practices for carbon farming to local farmers, while NIGCOMSAT's satellite services have enabled us to enhance our monitoring systems. Together, these partnerships allow us to support rural communities by improving their access to global carbon markets, offering new revenue streams while promoting sustainability.

**c. What are some of the critical roles your technical partners play in enhancing the accuracy and reliability of your carbon monitoring systems?**

Our technical partners, such as NIGCOMSAT, play a crucial role in providing the satellite data necessary for monitoring carbon sequestration. They ensure that our monitoring system is both accurate and reliable by supplying high-quality data, which is essential for effective carbon

analysis. Additionally, GSFN contributes by developing methodologies and best practices for carbon farming, ensuring that our systems are not only technically sound but also aligned with international standards.

### 7. Expanding Global Reach

**a. As CarbonEx grows, how are you planning to expand your initiatives beyond Nigeria and Africa?**

As CarbonEx scales, we aim to expand our carbon monitoring and trading platform to regions facing similar climate challenges, such as Southeast Asia and South America. Our technology is adaptable and can be customized to fit various environmental and regulatory contexts, allowing us to enter new markets. We are also open to exploring partnerships in India and plan to engage with stakeholders in other regions to replicate our success.

**b. Are there any international markets, such as India, where you see potential for growth and collaboration in carbon farming or clean energy solutions?**

Yes, India presents significant potential for growth in carbon accounting and trading, especially within clean energy initiatives such as solar power and electric mobility. We are particularly interested in India's commitment to decarbonizing key sectors like energy and transport, and we believe our technology can play a pivotal role in helping businesses and communities achieve their sustainability goals.

**c. How do you adapt your technologies to different regions while maintaining their effectiveness?**

We adapt our technologies by customizing our



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carbon monitoring platform to fit the specific environmental conditions and regulatory frameworks of each region. We also work closely with local stakeholders to ensure that our systems comply with regional standards. This flexibility ensures that our solutions remain effective while being scalable across different markets.

### 8. Leadership and Event Participation

#### a. What leadership strategies have you found most effective in fostering innovation and sustainability at CarbonEx?

At CarbonEx, fostering a culture of learning and adaptability has been essential for promoting innovation and sustainability. We encourage our team to explore new ideas, experiment with emerging technologies, and remain open to collaboration with external experts. Transparency is another key strategy; everyone on the team understands our goals and the impact we aim to achieve. By nurturing curiosity and empowering team members to take ownership of their contributions, we create an environment where innovation can thrive while we collect baseline data and develop our carbon monitoring projects.

#### b. How do you manage the balance between technical innovation and practical application in rural communities?

Striking a balance between innovation and practical application is essential, especially when working with rural farmers and communities. While our technology—such as satellite monitoring and data analysis—provides sophisticated insights, we present it in a simple and accessible manner for the farmers on the ground. As we collect data to establish

baselines for carbon sequestration, it's crucial to involve farmers in the process and consider their practices. We focus on practical training, open communication, and gradual implementation to bridge the gap between high-tech innovation and hands-on farming.

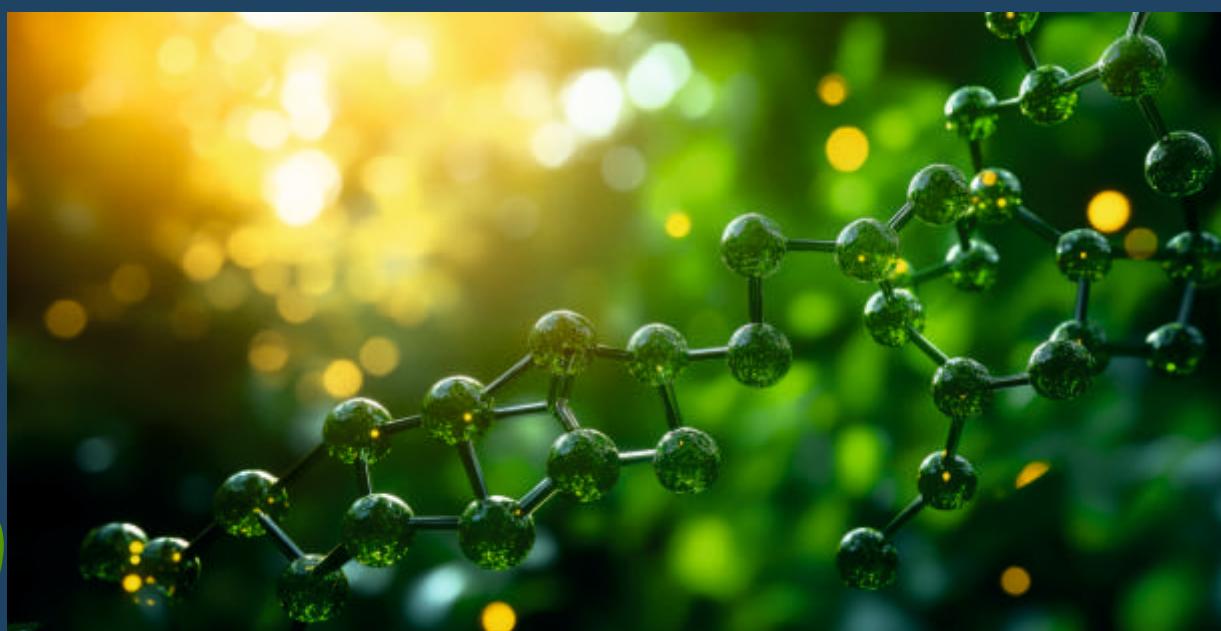
#### c. Can you share an example of a project where creative problem-solving led to a breakthrough in carbon sequestration?

One breakthrough moment occurred when we encountered challenges in encouraging farmers to adopt new carbon farming practices. Many were apprehensive about the short-term impact on their yields. To address this concern, we collaborated with agronomy experts to develop a hybrid approach that allowed farmers to gradually integrate sustainable practices, such as cover cropping, without disrupting their regular operations. This creative solution not only facilitated baseline data collection but also fostered farmer buy-in for our long-term carbon sequestration goals, paving the way for more widespread adoption of sustainable practices.

### 9. Impact and Future Vision

#### a. How does CarbonEx contribute directly to achieving the United Nations Sustainable Development Goals, particularly SDG 13 (Climate Action) and SDG 2 (Zero Hunger)?

CarbonEx is actively aligned with the United Nations Sustainable Development Goals, especially SDG 13 (Climate Action) and SDG 2 (Zero Hunger). While we are in the early stages of establishing baselines for our carbon farming projects, our initiatives focus on promoting sustainable agricultural practices that enhance productivity and sequester carbon in the soil. By



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reducing emissions and creating pathways for carbon credits, we contribute to climate mitigation. Additionally, our efforts to improve agricultural resilience directly support food security in rural communities. As we scale our operations, we envision making significant strides toward achieving these critical SDGs.

**b. What are some of the measurable outcomes you've seen in terms of reducing carbon emissions and improving agricultural resilience?**

While we are currently in the process of collecting baseline data for our carbon farming initiatives, early indicators show promising outcomes. Adoption rates among farmers utilizing our solutions have been encouraging, reflecting a clear pathway toward enhanced soil health and more sustainable land use. As we advance our monitoring of carbon sequestration, we expect to see measurable reductions in emissions, alongside improved crop yields resulting from better soil management practices. These outcomes will not only lay the groundwork for issuing carbon credits but also provide tangible benefits for both farmers and the environment.

**c. How do you foresee CarbonEx's role in contributing to these global goals evolving over the next decade?**

Over the next decade, CarbonEx envisions becoming a leader in carbon monitoring, accounting, and trading through a comprehensive platform that effectively tracks emissions reductions across various sectors. As we expand our reach beyond Nigeria and Africa, we anticipate playing a pivotal role in supporting global decarbonization efforts. By merging innovative technology with sustainable practices, we aim to facilitate a substantial reduction in global emissions while empowering rural communities to adopt clean technologies and economically benefit from participation in carbon markets.

### 10. Future Innovations and Trends

**a. What upcoming innovations or technologies do you believe will play a significant role in carbon sequestration and clean energy?**

Looking ahead, we believe that innovations in data analytics, artificial intelligence (AI), and the Internet of Things (IoT) will be pivotal in enhancing the monitoring of carbon sequestration across vegetation and clean energy projects. AI will enable us to optimize

land use and identify regions with high sequestration potential, while IoT will enhance the accuracy of real-time ground-truthing of carbon data from these initiatives. These emerging technologies are set to drive decarbonization efforts across various sectors, both in rural and urban settings, and will create new opportunities for diverse stakeholders in the climate space.

**b. How do you stay ahead of industry trends and continuously integrate cutting-edge technologies into CarbonEx's platform?**

To stay ahead of industry trends, we prioritize continuous research, collaboration, and adaptability. We actively monitor global climate forums, technological advancements, and regulatory changes to ensure that CarbonEx remains a leader in the carbon market. Our partnerships with technology providers allow us to integrate the latest innovations in satellite imaging, machine learning, and the Internet of Things (IoT) into our carbon monitoring processes. Additionally, we invest in learning from our peers in the climate-tech space, which keeps us competitive and agile as we grow.

**c. What role do you see for artificial intelligence and data analytics in the future of sustainable development?**

Artificial intelligence (AI) and data analytics will be transformative in the realm of sustainable development. AI can optimize carbon distribution by analyzing vast datasets to predict carbon sequestration potential and monitor changes in real time. Meanwhile, data analytics will be essential for making sustainability efforts measurable and accountable, empowering businesses and governments to make informed decisions. As we enhance our carbon monitoring platform, we view AI and data analytics as vital components for ensuring precision and scalability in carbon monitoring, reporting, and trading.

### 11. Personal Motivation and Legacy

**a. What drives your passion for sustainability and innovation, and how do you stay motivated?**

My passion for sustainability began in childhood, inspired by the vision of creating solutions that could enhance both my community and the environment. One of my early projects—a battery-powered backup system for my family—provided a glimpse into how technology can address local challenges. As I've matured, this passion has evolved to tackle

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global climate issues, fueling my desire to leave a lasting legacy of impactful change. Witnessing the tangible results of our work at CarbonEx—whether it's helping farmers increase their income or improving environmental outcomes—continues to motivate me every day.

**b. Looking back at your career, what accomplishment at CarbonEx are you most proud of?**

I take immense pride in developing a platform that enables African communities to participate in global carbon markets through their local carbon-saving projects. This initiative not only provides financial support to these vulnerable populations but also plays a crucial role in combating climate change. The positive impact we've created inspires me and reinforces the importance of our mission.

**c. What legacy do you hope to leave through your work with CarbonEx and your contributions to the global fight against climate change?**

I aspire to leave a legacy where sustainability and economic opportunity are intertwined, particularly for underserved communities. My vision is for CarbonEx to emerge as a global leader in delivering impactful solutions for climate change, fostering a more sustainable and equitable future. I want future generations to inherit a world in which businesses like CarbonEx have made substantial strides in reducing emissions while simultaneously enhancing livelihoods.

### 12. Indian Market and Opportunities

**a. Given India's focus on decarbonization, how do you envision CarbonEx's solutions contributing to the Indian market?**

CarbonEx's solutions are well-suited to the Indian market landscape. India's ambitious decarbonization goals present an exciting

opportunity for us to expand our carbon monitoring platform across various sectors. Initially, we focused on agriculture, but our technology can also effectively track and trade carbon savings from clean cooking, transportation, and energy solutions. By leveraging our platform, India can accurately

monitor carbon reductions from smart cookstoves, electric vehicle initiatives, and renewable energy projects, creating a robust framework for carbon credit trading. CarbonEx's ability to provide reliable, sector-specific carbon data ensures that industries can engage meaningfully in global carbon markets while propelling the country closer to its net-zero targets.

**b. Are you currently in talks with any Indian organizations or government bodies for partnerships?**

We are actively exploring opportunities in India and are eager to engage with relevant stakeholders in both the public and private sectors. Our goal is to forge partnerships that align with India's climate objectives, ensuring that CarbonEx's technology and methodologies can be effectively implemented to support the country's sustainability initiatives.

**c. What unique challenges and opportunities do you foresee when bringing your technologies to India, and how do you plan to address them?**

One of the main challenges in India will be navigating the complexities of carbon tracking initiatives for diverse carbon-saving and reduction practices, as well as ensuring local buy-in for our solutions. However, India's strong commitment to decarbonization presents a significant opportunity for CarbonEx. Each industry has distinct decarbonization needs, and our platform is designed to be flexible, allowing us to tailor our solutions to various sectors, including clean transport, renewable energy, and clean cooking. Our advanced use of satellite remote sensing and machine learning will enable us to monitor emissions reductions across multiple projects with high accuracy. By effectively tracking carbon savings, we can facilitate smooth carbon credit trading across sectors, empowering businesses to monetize their sustainability efforts while advancing India's climate goals.





ON AVERAGE,

YOU CONSUME

3.5 MILLION kWh OF ENERGY

FROM THIS PLANET

IN YOUR LIFETIME.

HOW MUCH DO YOU GIVE BACK?

AT NET GREEN FOUNDATION, WE'RE COMMITTED TO BALANCING THIS EQUATION BY PROMOTING RENEWABLE ENERGY SOLUTIONS AND REDUCING OUR CARBON FOOTPRINT. TOGETHER, WE CAN GIVE BACK TO THE PLANET BY EMBRACING CLEAN, SUSTAINABLE ENERGY. IT'S TIME TO POWER A GREENER FUTURE—STARTING TODAY.



**UTVYAKTA SOLUTIONS CONTRIBUTES  
TO A BROADER SUSTAINABLE INDUSTRIAL  
ECOSYSTEM BY PROVIDING INNOVATIVE  
TECHNOLOGIES THAT ENHANCE ENERGY  
EFFICIENCY AND REDUCE EMISSIONS  
ACROSS VARIOUS SECTORS.**



**Frederik Vyncke**  
Co-Founder & Sales Director

- 1. Reflecting on COP28 Participation**
  - a. Utvyakta Solutions participated in COP28 as a startup last year. Could you share key takeaways from that experience and how it has shaped your approach to scaling sustainable solutions?**

We had a good time building bridges between our company and potential customers and collaborators and also had the opportunity to understand how we, as a company, can improve our ESG focus.

- b. What were the most impactful conversations or partnerships that emerged from COP28, and how are they influencing your current strategies?**

We gained a good understanding that our focus is the right one, and we have put steps in place to further our specialization and add more resources for this.

- 2. Enabling Intelligence for Air Compressors**
  - a. Utvyakta Solutions specializes in enabling intelligence for industrial air compressors. How do smart compressors differ from traditional ones in terms of energy efficiency and operational performance?**

Smart compressors differ from traditional ones by utilizing advanced sensors and IoT technology to monitor real-time performance and optimize energy consumption dynamically. This enables them to adjust operating parameters based on actual demand, leading to significant energy savings and reduced operational costs. Additionally, smart compressors often incorporate predictive maintenance features, which enhance reliability and performance by identifying potential issues before they escalate, minimizing downtime, and extending equipment lifespan.

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**b. Could you explain how your IIoT solution integrates real-time analytics to monitor and optimize the performance of air compressors?**

Our IIoT solution integrates real-time analytics by continuously collecting data from various sensors installed on air compressors, providing insights into key performance indicators such as pressure, temperature, and energy consumption. This data is analyzed using advanced algorithms to identify patterns and trends, enabling proactive adjustments to optimize performance and reduce energy usage. Additionally, the system generates actionable alerts and reports, allowing operators to make informed decisions for maintenance and operational improvements, ultimately enhancing efficiency and reliability.

**c. How does predictive maintenance, enabled by your AI-backed systems, contribute to reducing both energy consumption and maintenance costs for your clients?**

Predictive maintenance, powered by our AI-backed systems, analyzes historical and real-time data to forecast potential equipment failures, allowing clients to address issues before they lead to costly breakdowns. By preventing unexpected downtime, clients can maintain optimal operational efficiency, which, in turn, reduces energy consumption associated with inefficient or malfunctioning equipment. Additionally, this proactive approach to maintenance lowers overall maintenance costs by minimizing emergency repairs and extending the lifespan of equipment through timely servicing.

**3. Supporting UN SDG Goals**

**a. Your solution aligns with the UN SDG goal of promoting industries, innovation, and infrastructure. How do you see Utvyakta Solutions contributing to a broader sustainable industrial ecosystem?**

Utvyakta Solutions contributes to a broader

sustainable industrial ecosystem by providing innovative technologies that enhance energy efficiency and reduce emissions across various sectors. By enabling industries to adopt smart, data-driven solutions, we help them optimize resource use and minimize waste, aligning with sustainable development goals. Furthermore, we foster collaboration with stakeholders and partners, promoting best practices and knowledge sharing that drive collective progress toward a more sustainable and resilient industrial landscape.

**b. By reducing carbon emissions by 15%, how do you anticipate your technology helping industries meet their sustainability targets, especially in carbon-intensive regions?**

By reducing carbon emissions by 15%, our technology enables industries to make significant progress toward their sustainability targets, particularly in carbon-intensive regions where emissions reduction is crucial for regulatory compliance and community impact. This reduction not only supports companies in enhancing their environmental performance but also helps them improve their overall operational efficiency and reputation as responsible corporate citizens.

**c. What role does real-time data play in helping industries take proactive steps toward more sustainable energy consumption?**

Real-time data plays a crucial role in enabling industries to monitor their energy consumption patterns, identify inefficiencies, and make informed decisions for immediate corrective actions. By leveraging this data, companies can optimize resource use, reduce waste, and implement strategies that lead to more sustainable energy practices and lower overall carbon footprints.

**4. Impact on the Industrial Sector**

**a. With over 80% market share of key compressor OEMs in India, how has Utvyakta Solutions impacted the overall energy efficiency of the industrial sector?**

Utvyakta Solutions has significantly impacted the energy efficiency of the industrial sector in India by providing advanced compressor technologies that optimize performance and reduce energy consumption across various applications. Our collaboration with over 80% of key compressor OEMs enables us to drive widespread adoption of energy-efficient solutions, contributing to lower operational costs



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and a reduced carbon footprint for our clients.

- b. **Can you share an example where your real-time monitoring solution significantly improved both energy savings and operational efficiency for a client?**

One notable example is when our real-time monitoring solution was implemented at a manufacturing facility, resulting in a 20% reduction in energy consumption while simultaneously increasing overall operational efficiency by 15%. By providing insights into equipment performance and enabling timely adjustments, we helped the client optimize their processes, ultimately leading to significant cost savings and improved productivity.

- c. **How do you tailor your solutions to meet the specific needs of industries that rely heavily on air compressors, such as manufacturing and automotive sectors?**

We tailor our solutions for industries like manufacturing and automotive by conducting in-depth assessments of their specific processes and identifying unique challenges and energy consumption patterns. Based on these insights, we customize our compressor technologies and monitoring systems to optimize performance, enhance efficiency, and ensure seamless integration with their existing operations.

### 5. Driving Energy Efficiency with Data

- a. **Your focus on real-time analytics and AI-driven backend systems is transforming how industries manage energy. How does**

#### **this technology empower businesses to cut costs while improving sustainability?**

Our focus on real-time analytics and AI-driven backend systems empowers businesses to cut costs by identifying inefficiencies and optimizing energy use based on actual demand, leading to significant savings on operational expenses. Additionally, this technology enhances sustainability by enabling companies to monitor their environmental impact in real time and make data-informed decisions that reduce waste and lower carbon emissions.

- b. **How do you foresee advancements in AI and machine learning contributing to even greater efficiencies in the industrial space in the future?**

Advancements in AI and machine learning are expected to contribute to greater efficiencies in the industrial space by enabling more sophisticated predictive analytics, which will enhance decision-making and optimize resource allocation in real-time. As these technologies evolve, they will also facilitate greater automation, allowing for seamless integration of processes and minimizing human error, ultimately driving productivity and sustainability across various sectors.

- c. **Can you describe how your solution helps calculate energy savings and what measurable impact this has had on your clients' environmental footprint?**

Our solution calculates energy savings by continuously monitoring energy consumption and performance metrics, allowing for precise

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analysis of efficiency improvements and operational adjustments. This data-driven approach has enabled our clients to achieve measurable impacts, such as reducing their energy consumption by up to 25%, significantly lowering their overall environmental footprint and greenhouse gas emissions.

### 6. Global Expansion and Market Reach

- a. **Utvyakta Solutions has recently expanded into Sweden. How do you plan to adapt your technology and business model for different regional markets?**

As we expand into Europe, we plan to adapt our technology and business model by conducting thorough market research to understand the specific needs, regulations, and energy goals of the region. We will customize our solutions to align with local sustainability initiatives and integrate seamlessly with existing infrastructure while ensuring compliance with Swedish environmental standards. Additionally, we will build strategic partnerships with local stakeholders to enhance our market presence and support a smoother entry into the new market.

- b. **Could you share insights on the challenges and opportunities of deploying your solution in new geographies, particularly in terms of regulatory and infrastructure readiness?**

Deploying our solution in new geographies presents challenges such as navigating diverse

regulatory frameworks and ensuring compliance with local environmental standards, which can vary significantly from one region to another. Additionally, infrastructure readiness can be a concern, as existing systems may require upgrades to integrate our advanced technologies effectively. However, these challenges also present opportunities to tailor our solutions to meet local needs, foster innovation, and build collaborative relationships with local partners, ultimately driving greater adoption of energy-efficient practices.

- c. **How does your collaboration with international partners, like Cloudividia, help accelerate the adoption of Industry 4.0 solutions worldwide?**

Our collaboration with international partners like Cloudividia enhances the adoption of Industry 4.0 solutions by leveraging their expertise in cloud computing and data analytics, enabling us to offer more comprehensive and integrated solutions. By combining our strengths, we can deliver scalable technologies that address specific regional needs and drive innovation across various industries. This partnership also facilitates knowledge sharing and access to new markets, accelerating the implementation of smart technologies and promoting sustainable practices globally.

### 7. Strategic Partnerships and Collaborations

- a. **What types of collaborations do you envision being most impactful in driving**



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### **sustainable industrial transformation, especially in the coming years?**

I envision collaborations between technology providers, industry stakeholders, and governmental bodies as being most impactful in driving sustainable industrial transformation. These partnerships can foster innovation by combining expertise in technology, regulatory compliance, and industry-specific knowledge to develop tailored solutions that meet sustainability goals. Additionally, collaborations with academic institutions and research organizations can enhance the development of cutting-edge technologies and methodologies to address complex sustainability challenges. Finally, engaging with non-governmental organizations (NGOs) will be essential for promoting awareness and best practices, ensuring that the transformation toward sustainability is holistic and inclusive across all sectors.

### **8. Predictive Maintenance and AI-Enabled Solutions**

#### **a. Predictive maintenance is one of the key advantages of your solution. How does it reduce unplanned downtime and improve the life cycle of industrial air compressors?**

Predictive maintenance reduces unplanned downtime by using real-time data and AI algorithms to forecast potential equipment failures, allowing operators to address issues before they escalate into major problems. This proactive approach not only enhances the reliability of industrial air compressors but also extends their life cycle by ensuring timely maintenance and optimal operating conditions.

#### **b. What role does AI play in identifying early signs of wear and tear or inefficiencies, and how does this enhance decision-making for industrial operators?**

AI plays a crucial role in identifying early signs of wear and tear or inefficiencies by analyzing vast amounts of sensor data to detect anomalies and patterns that may indicate potential issues. This predictive capability enhances decision-making for industrial operators by enabling them to take proactive measures, such as scheduling maintenance before failures occur, ultimately reducing downtime and operational costs.

#### **c. How do you think AI and machine learning will further transform predictive maintenance and energy management in the industrial sector?**

AI and machine learning will further transform

predictive maintenance and energy management in the industrial sector by enabling more accurate forecasting of equipment failures and energy demands based on historical data and real-time analytics. This technology will enhance decision-making processes, allowing businesses to implement targeted maintenance schedules and optimize energy usage more effectively. Additionally, as AI algorithms continue to evolve, they will facilitate the development of self-optimizing systems that automatically adjust operational parameters to maximize efficiency and minimize costs, driving significant advancements in sustainability.

### **9. Real-Time Monitoring and Energy Optimization**

#### **a. How does your integrated dashboard provide real-time insights into compressor health, and what value does this add for industrial operators?**

Our integrated dashboard provides real-time insights into compressor health by continuously monitoring key performance indicators such as pressure, temperature, and energy consumption, allowing operators to track performance metrics at a glance. This functionality enables industrial operators to quickly identify potential issues and make informed decisions, minimizing downtime and optimizing maintenance schedules. By enhancing operational visibility, the dashboard adds significant value by improving efficiency, reducing operational costs, and extending the lifespan of the equipment.

#### **b. Could you describe the key benefits of real-time monitoring in terms of both energy savings and carbon footprint reduction?**

Real-time monitoring provides key benefits by enabling immediate visibility into energy consumption patterns, allowing for timely adjustments that lead to significant energy savings. By identifying inefficiencies and optimizing equipment performance, businesses can reduce unnecessary energy use, which directly contributes to lowering their carbon footprint. Additionally, continuous data analysis allows organizations to set and achieve sustainability targets more effectively, aligning their operations with broader environmental goals.

#### **c. How have you seen your solution drive immediate operational improvements for clients in industries heavily dependent on compressors?**



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Our solution has driven immediate operational improvements for clients in compressor-dependent industries by enhancing performance visibility through real-time monitoring and analytics. Clients have reported significant reductions in energy consumption and operational costs, often achieving efficiency gains of 15–20% shortly after implementation. Additionally, the proactive maintenance alerts generated by our system have minimized unexpected downtime, allowing clients to maintain consistent production levels and improve overall operational reliability.

### 10. The Future of Industry 4.0 and Smart Manufacturing

- a. As a leader in enabling Industry 4.0 for compressors, how do you envision the evolution of smart manufacturing over the next decade?

As a leader in enabling Industry 4.0 for compressors, I envision smart manufacturing becoming increasingly autonomous, driven by advanced AI and IoT technologies. Data analytics and predictive maintenance will play a central role, allowing for real-time optimization, reduced downtime, and enhanced energy efficiency. Over the next decade, smart factories will integrate seamlessly with supply chains, creating more agile, scalable, and sustainable production systems.

- b. What role does your technology play in making factories more sustainable while driving productivity through digital transformation?

Our technology enhances sustainability by optimizing energy usage and reducing waste through real-time monitoring and predictive maintenance. By enabling digital transformation, we drive productivity with automated systems that increase operational efficiency and minimize downtime.

- c. How are you preparing Utvyakta Solutions for the next wave of industrial automation and connectivity?

At Utvyakta Solutions, we are preparing for the next wave of industrial automation by investing in advanced AI, IIoT, and machine learning technologies to enhance connectivity and streamline operations. Additionally, we focus on building strategic partnerships and upskilling our workforce to adapt to emerging trends and ensure seamless integration of new technologies.

### 11. Overcoming Barriers to Adoption

- a. What are the main barriers you've encountered when introducing your IIoT and AI-driven solutions to more traditional industries, and how do you address these challenges?

The main barriers we've encountered when introducing IIoT and AI-driven solutions to traditional industries are resistance to change, legacy systems integration, and concerns over data security. We address these challenges by offering tailored solutions that allow for gradual adoption, ensuring compatibility with existing systems and demonstrating clear ROI. Additionally, we prioritize robust cybersecurity measures and provide comprehensive training to build trust and confidence in our technologies.

- b. How do you ensure that businesses in regions with limited technological infrastructure can still benefit from your energy-efficient solutions?

We ensure that businesses in regions with limited technological infrastructure can benefit from our energy-efficient solutions by offering scalable and adaptable technologies that require minimal initial investment. Our solutions can operate with lower bandwidth, leveraging edge computing to minimize reliance on continuous internet connectivity. Additionally, we provide on-site support, training, and localized maintenance services to help businesses overcome infrastructure challenges and achieve sustainable growth.

- c. In your experience, what policies or incentives could governments implement to help drive wider adoption of energy-efficient technologies like yours?

Governments could implement tax incentives, grants, and subsidies to lower the cost of adopting energy-efficient technologies, making them more accessible to businesses of all sizes. Additionally, creating clear regulatory frameworks that promote sustainability standards and offering support for infrastructure development would accelerate wider adoption.

### 12. The Role of ESG in Your Business Strategy

- a. How central is ESG to Utvyakta Solutions' business model, and how do you ensure that your energy solutions meet the high sustainability standards of your clients?

ESG is central to Utvyakta Solutions' business model, as we prioritize sustainability, ethical

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practices, and long-term environmental impact in our operations and product offerings. We ensure our energy solutions meet high sustainability standards by continuously innovating for energy efficiency, using eco-friendly materials, and adhering to strict industry regulations and client-specific sustainability goals.

**b. Could you share any measurable outcomes where your solution has directly contributed to a company's ESG performance?**

One measurable outcome is a 25% reduction in energy consumption achieved by a manufacturing client using our AI-driven optimization tools, significantly lowering their carbon footprint. Additionally, our predictive maintenance solutions helped another client reduce equipment downtime by 30%, contributing to improved operational efficiency and waste reduction, aligning with their ESG goals.

**c. What future trends do you see in the ESG space, particularly as they relate to industrial energy consumption and carbon reduction?**

In the ESG space, future trends will likely focus on stricter carbon reduction targets and the adoption of cleaner, renewable energy sources to power industrial operations. We also foresee a growing demand for real-time carbon tracking and transparent reporting tools, enabling industries to optimize energy consumption and meet increasingly stringent sustainability regulations.

### 13. Circular Economy and Sustainable Resource Management

**a. How does your technology support the concept of a circular economy, particularly in terms of optimizing resource use and minimizing waste in industrial processes?**

Our technology supports the circular economy by using advanced analytics and AI to optimize resource use, ensuring materials and energy are utilized efficiently throughout production cycles. Additionally, our predictive maintenance and monitoring systems help minimize waste by reducing equipment inefficiencies, extending product lifecycles, and enabling the reuse of resources.

**b. Could you share an example where your solution has helped reduce material waste and improve overall resource efficiency in**

**a specific industry?**

In the automotive industry, our solution helped a manufacturer reduce power consumption by 20% through real-time monitoring and optimization of their production processes. By identifying inefficiencies and providing actionable insights, we enabled them to streamline operations, leading to improved resource efficiency and significant cost savings.

**c. How do you envision the circular economy shaping the future of business innovation and sustainability, especially in industrial sectors?**

I envision the circular economy driving business innovation by encouraging industries to develop sustainable practices that prioritize resource reuse and waste reduction, ultimately leading to more resilient supply chains. This shift will foster new business models centred around sustainability, prompting companies to innovate in product design, manufacturing processes, and end-of-life solutions to minimize their environmental impact.

### 14. Scaling Sustainability Through Innovation

**a. How do you balance the drive for technological innovation with the need to scale your solutions in a way that maximizes their sustainability impact?**

We balance technological innovation and scalability by designing flexible solutions that can be adapted to different industrial contexts while maintaining a strong focus on sustainability from the outset. By collaborating with clients to understand their specific needs and integrating sustainable practices into our development process, we ensure that our innovations effectively maximize their positive environmental impact.

**b. What advice would you give to other cleantech startups aiming to innovate in the energy efficiency sector?**

I advise cleantech startups to prioritize understanding the unique challenges and needs of their target industries, ensuring that their solutions are practical and easily adoptable. Additionally, building strong partnerships with stakeholders, including government bodies and industry leaders, can enhance credibility and facilitate access to resources and networks essential for growth and innovation.

### 15. The Road Ahead for Global Climate Action

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- a. **How do you plan to position Utvyakta Solutions as a long-term partner in global climate governance, particularly in relation to the United Nations' Net Zero targets?**

To position Utvyakta Solutions as a long-term partner in global climate governance, we will actively engage in collaborative initiatives that align our technologies with the United Nations Net Zero targets. By providing innovative, data-driven solutions that facilitate emissions reductions and enhance energy efficiency, we can support industries in meeting their sustainability goals. Additionally, we will participate in industry forums and partnerships that promote knowledge sharing and best practices, reinforcing our commitment to driving meaningful change in the global climate landscape.

- c. **Finally, what legacy do you hope to leave through your work in transforming industrial energy use and contributing to a more sustainable future?**

Through my work in transforming industrial energy use, I hope to leave a legacy of innovation that empowers businesses to adopt sustainable practices and significantly reduce their environmental impact. I envision a future where energy-efficient technologies become the standard, enabling industries to thrive economically while being responsible stewards of the planet. Ultimately, I aspire to inspire the next generation of leaders and innovators to continue advancing sustainability in all sectors, fostering a culture of environmental responsibility.



**INTEGRATING IOT, AI, AND BLOCKCHAIN  
STREAMLINES RESOURCE MANAGEMENT,  
IMPROVES ACCESS TO ESSENTIAL  
SERVICES, AND ESTABLISHES  
TRANSPARENT ECOSYSTEMS THAT  
DRIVE SUSTAINABLE GROWTH.**



### **Utpal Nath**

Chairperson and Chief  
Impact Officer, Kolong Foundation

- 1. Kolong Foundation focuses on uplifting communities through economic empowerment, skill enhancement, and sustainability. How do you ensure that your initiatives have a measurable and lasting impact on local communities?**

The Kolong Foundation, founded less than a year ago, is dedicated to creating lasting community impact. Our flagship initiative, Project eXiT in Nagaon, Assam, is a scalable model for sustainable rural development, engaging local leaders, farmers, entrepreneurs, and agencies from the start. This community-driven approach ensures that each project aligns with local cultural, social, and economic contexts, fostering a sense of ownership and long-term sustainability.

We measure success with clear metrics: improved agricultural yields, reduced water use, and increased farmer income, as well as higher

completion rates for digital literacy and skills programmes. For our economic initiatives, we track access to community retail hubs and digital platforms. This focus on measurable outcomes ensures transparency, allowing us to refine strategies and increase impact.

Project eXiT is designed for expansion, with plans underway for rollouts in Chennai, Kerala, Telangana, Rajasthan, and internationally in Mexico. Through data-backed measurement, scalable methods, and community collaboration, Kolong Foundation aims to deliver enduring benefits across diverse regions.

- 2. Could you share specific examples of how Kolong Foundation has successfully integrated sustainable practices into sectors like agriculture, healthcare, and education?**

## TRANSFORMING SUSTAINABLE GROWTH WITH IOT, AI, BLOCKCHAIN

Project eXiT by Kolong Foundation is transforming sustainable practices in agriculture, healthcare, and education across Assam. In agriculture, we're integrating IoT and AI to optimise farming. IoT sensors monitor soil and weather, while AI provides real-time advice on water and pest management, boosting yields by 30% and reducing water use. We also advocate organic farming, protecting both the environment and local health.

In healthcare, we're addressing access barriers by setting up wellness hubs for in-person and remote consultations, cutting down travel and wait times. AI-driven diagnostics help in early detection of chronic diseases, and our renewable energy-powered wellness units reach isolated areas.

Education is key to our mission. Through our Eklavya platform and collaboration with Assam Skill University, we offer digital learning tools and courses on sustainable business, agriculture, renewable energy, and entrepreneurship, empowering students and their families while strengthening communities.

3. **What challenges do you face in implementing decentralized, sustainable business models across diverse sectors such as entertainment, food, and technology?**

Implementing decentralized, sustainable business models in rural areas, like Assam, brings both opportunity and challenge. A significant hurdle we face is limited infrastructure—particularly electricity, internet, and transport—which are essential for our initiatives. To address this, the Kolong Foundation is establishing solar-powered microgrids to ensure that our projects have the infrastructure needed to succeed.

Another obstacle is the lack of digital literacy, which has made communities hesitant to adopt new technologies like IoT, AI, and blockchain. To bridge this gap, we are investing in capacity-building through our flagship initiative in Nagaon, conducting workshops that equip local farmers, artisans, women, and entrepreneurs with skills to leverage these technologies. This hands-on approach is not only practical but builds trust in these new systems.



## TRANSFORMING SUSTAINABLE GROWTH WITH IOT, AI, BLOCKCHAIN



Access to finance is also a barrier for small-scale entrepreneurs, especially in the food and handicraft sectors, who often lack traditional financing options. To support them, we've introduced a blockchain-based microfinance initiative, "Corpus for Green Entrepreneurs," providing transparent, low-cost financing within our entrepreneurship programs.

Key to our model's success is the use of forward and backward linkages. Backward linkages involve sourcing raw materials locally, strengthening supply chains and supporting farmers. Through training, we're promoting sustainable agriculture, increasing yields and reducing environmental impact. Forward linkages connect local producers with distributors and retailers, empowering them to market their goods effectively. Our blockchain technology offers a transparent supply chain, enabling consumers to trace the origin of products, which boosts demand for sustainable, locally-sourced goods.

Central to our strategy is the PURA (Providing Urban Amenities to Rural Areas) framework, conceived by Dr. A.P.J. Abdul Kalam, which aims to close the rural-urban divide by ensuring access to essentials like clean water, electricity, and education. Through solar microgrids, we're enhancing local energy access, vital for businesses to flourish, and fostering a self-sustaining ecosystem that nurtures local entrepreneurship.

Our Decentralized Economy (DE) approach

promotes local production and consumption, bolstering community resilience against global market shifts. This focus on localized systems reduces dependence on distant suppliers, a need highlighted by the COVID-19 pandemic's impact on global supply chains.

Our work with Project eXiT in Nagaon is now scaling to regions across India and internationally. This expansion demonstrates the adaptability of our model and our commitment to sustainable, community-driven development. By integrating linkages, the PURA framework, and DE principles, we're building a holistic, sustainable path toward long-term success and local empowerment.

4. You've emphasized the use of disruptive technologies like IoT, AI, and blockchain in fostering community development. How do you see these technologies playing a pivotal role in achieving sustainability goals, particularly in emerging economies like India?

Disruptive technologies like the Internet of Things (IoT), Artificial Intelligence (AI), and blockchain are revolutionising sustainability efforts in emerging economies, particularly in India. These technologies provide scalable and cost-effective solutions for critical issues such as resource management, access to essential services, and transparency.

IoT significantly optimises resource use,

## TRANSFORMING SUSTAINABLE GROWTH WITH IOT, AI, BLOCKCHAIN

especially in agriculture. By embedding sensors in irrigation systems and weather stations, IoT devices deliver real-time data that helps farmers improve water efficiency, reduce reliance on fertilisers, and monitor crop health. In India, where agriculture is a key economic driver, IoT-driven smart farming has led to yield increases of up to 30% while conserving water and enhancing resilience against climate change.

AI enhances sustainability through predictive analytics and automation. AI systems can analyse weather patterns and soil conditions to determine optimal planting times, thereby minimising waste and maximising agricultural yields. In healthcare, AI automates diagnostics, providing timely assessments for rural communities and improving access to quality services.

Blockchain addresses transparency and trust issues in financial and supply chain transactions. By creating a secure, immutable ledger for transactions in microfinance, agriculture, and retail, blockchain fosters trust among stakeholders. This is crucial for small-scale farmers and entrepreneurs in rural areas, who often face delayed payments and fraud.

Integrating IoT, AI, and blockchain streamlines resource management, improves access to essential services, and establishes transparent ecosystems that drive sustainable growth. For India, where the rural economy is vital, leveraging these technologies is essential for achieving economic and environmental sustainability goals.

**5. In your experience, how can businesses leverage these technologies to improve transparency and efficiency while addressing environmental and social challenges?**

At Kolong Foundation, we recognise the power of technology to address critical environmental and social challenges. By harnessing IoT, AI, and blockchain, businesses are advancing sustainability through data-driven insights, transparency, and efficiency. For example, IoT and AI enable real-time monitoring in agriculture, optimising water and fertiliser use for more sustainable farming. In manufacturing, AI-driven logistics reduce fuel consumption and emissions. Blockchain transforms supply chains by enhancing transparency, allowing consumers to track products from farm to table, thus reinforcing trust in sustainable practices.

Additionally, blockchain facilitates

microfinance, empowering rural entrepreneurs and underserved communities who lack traditional banking access. AI and IoT bring essential services like telemedicine to remote areas, promoting inclusivity. These technologies also help businesses minimise their environmental footprint by monitoring energy consumption, managing demand, and supporting renewable energy adoption. At Kolong, we believe in technology's role in creating a sustainable, inclusive future.

**6. How does Kolong Foundation ensure that these innovations are accessible and beneficial to underserved or rural communities?**

At Kolong Foundation, we're committed to



making transformative technologies accessible and impactful for communities. Our approach prioritises digital literacy, affordability, localisation, collaboration, and scalability. Through Project eXiT, we establish centres where residents learn to use AI-driven agricultural tools, blockchain-based microfinance, and IoT solutions for managing water and energy. By enhancing digital literacy, we empower individuals to improve their livelihoods.

Affordability is key to adoption, so we collaborate with governments, businesses, and NGOs to subsidise technology costs, making tools like IoT devices and telemedicine more accessible. We also tailor our initiatives to meet regional needs, focusing on IoT for rice farming in Assam and cash crops in Kerala and Telangana. Our expansion into Mexico will address local sustainability challenges. Collaboration with local leaders ensures community support, while our scalable model, starting with Project eXiT, allows us to expand impact across India and beyond.

**7. With food security being a major global challenge, what strategies does Kolong Foundation implement to promote**



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### **sustainable agricultural practices and enhance food systems resilience?**

At Kolong Foundation, we are tackling the global challenge of food security through a holistic approach that merges sustainable agricultural practices with efforts to enhance food system resilience. We integrate traditional knowledge with modern technologies to develop practical, scalable solutions.

Our key focus is on promoting climate-smart agriculture, which boosts productivity while reducing greenhouse gas emissions and increasing resilience to climate change. In our flagship initiative, Project eXiT in Assam, we collaborate with local farmers to implement sustainable practices such as crop rotation, agroforestry, and the use of drought-resistant seeds. We advocate for integrated pest management strategies to decrease reliance on chemical pesticides, fostering a healthier environment and ensuring long-term soil fertility.

We leverage IoT and AI technologies to improve agricultural efficiency. IoT sensors monitor crucial factors like soil moisture and temperature, enabling farmers to make informed, data-driven decisions about irrigation and fertiliser use. This optimises resource application and significantly enhances agricultural resilience. AI algorithms help predict crop yields and identify optimal planting and harvesting times, effectively mitigating risks from unpredictable climate patterns.

Sustainable water management is another vital aspect of our strategy. We implement rainwater harvesting systems and drip irrigation techniques to promote efficient water use. In water-scarce areas like Assam and Kerala, we encourage community-based water management models that reduce the water footprint of farming and secure resources for future generations.

Additionally, we promote organic and regenerative agricultural practices, assisting farmers in transitioning from chemical-intensive methods to organic approaches. This enhances soil health and produces healthier food. By strengthening local food supply chains and connecting farmers directly with new markets, we reduce transportation costs, minimise food waste, and ensure food accessibility for local communities, especially in rural areas.

- 8. How do you see the role of local entrepreneurship and technological innovations in transforming the**

### **agricultural sector in India, especially in relation to climate change adaptation?**

We believe that local entrepreneurship and technological innovation are vital for transforming India's agricultural sector, especially in the face of climate change. At Kolong Foundation, our mission is to empower local entrepreneurs to spearhead rural transformation by promoting food and agri-entrepreneurship. We assist farmers and small business owners in moving beyond subsistence farming to create value-added products, including organic fertilizers, artisanal foods, and biofuels. These initiatives not only generate new revenue streams but also enhance community resilience against climate shocks.

We are integrating technological innovation into climate-adapted agriculture. For example, IoT sensors on farms provide real-time weather monitoring, enabling farmers to make informed decisions regarding irrigation and pest control amidst unpredictable weather. AI models analyse historical data to forecast climate patterns, allowing farmers to anticipate droughts and floods, and choose resilient crop varieties. Additionally, blockchain technology ensures supply chain transparency, enabling consumers to trace agricultural products from farm to table, which is crucial for organic and climate-adapted goods.

We also support agri-tech start-ups developing innovative climate adaptation solutions. Through collaborations with local innovation hubs, we offer access to funding, mentorship, and advanced technology, fostering transformative ideas like smart irrigation systems and biodegradable packaging.

- 9. Can you share your vision for how Kolong Foundation aims to collaborate with farmers, agribusinesses, and government agencies to create sustainable agricultural ecosystems?**

At Kolong Foundation, we envision sustainable agricultural ecosystems fostered by collaborative partnerships among entrepreneurs, farmers, agribusinesses, NGOs, and government agencies. We believe that uniting all stakeholders around shared goals of environmental stewardship, economic empowerment, and food security is essential for achieving sustainable agriculture.

Recognising farmers as the backbone of the agricultural ecosystem, we prioritise their engagement and education through training



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programmes on sustainable practices such as organic farming and water conservation. These initiatives are delivered via Farmer Field Schools and digital platforms, providing continuous support and knowledge access. We promote cooperative formation to pool resources, share expertise, and access larger markets collectively. Our partnerships with entrepreneurs and agribusinesses are crucial for scaling sustainable practices. We work together to create a sustainable and profitable value chain, leveraging market insights and fair pricing. We are also implementing blockchain systems to ensure transparency and fair pricing for smallholder farmers, bridging the gap to the broader agribusiness ecosystem.

Engaging with NGOs and government agencies

is vital for fostering an enabling environment for sustainable agriculture. We advocate for policies that provide access to microfinance and disaster relief, aiming to enhance rural infrastructure through public-private partnerships, thereby promoting long-term sustainability and resilient rural communities.

**10. Education and skill development are core areas of focus for Kolong Foundation. How do your programs empower individuals to take an active role in sustainability and social entrepreneurship?**

At Kolong Foundation, we believe education and skill development are vital for promoting sustainability and social entrepreneurship,



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particularly in rural and underserved communities. Our programmes equip individuals with the skills and knowledge needed for sustainable development, focusing on practical lessons in organic farming, renewable energy, and waste management. For example, our flagship initiative, Project eXiT in Assam, teaches local farmers sustainable techniques like crop rotation and composting, enhancing yields while promoting eco-friendly practices.

We also provide training in business management and financial literacy, encouraging participants to create enterprises that address social and environmental challenges. By supporting microenterprise development, we help entrepreneurs in the food sector develop eco-friendly products. Our programmes emphasise local leadership, empowering individuals to advocate for sustainability initiatives within their communities. Integrating emerging technologies, we prepare participants to enhance operational efficiency and drive broader social impact, ensuring they are equipped to contribute meaningfully to sustainability efforts.

## 11. What role do you see education playing in fostering a new generation of leaders who are equipped to tackle sustainability challenges, especially in rural and underdeveloped areas?

Education is pivotal in shaping future leaders who can tackle pressing sustainability challenges, especially in rural and underdeveloped areas. It equips individuals with the knowledge, skills, and confidence to address issues like climate change and social inequality. By focusing on sustainability, we provide tools to understand the interconnections between environmental, social, and economic systems. Teaching students about climate resilience, renewable energy, and sustainable agriculture empowers them to devise tailored solutions for their communities. Furthermore, integrating sustainability into the curriculum nurtures a sense of responsibility for the planet, encouraging students to become champions of positive change. Expanding educational systems beyond basic literacy to include technical skills and sustainable practices fosters resilience among vulnerable populations. Education enables these communities to implement climate-smart solutions, ensuring they thrive amid environmental challenges.

Ultimately, empowered by education, these innovative leaders will drive inclusive growth and climate resilience in their regions.

## 12. Could you provide examples of any innovative educational models or partnerships Kolong Foundation has initiated to promote sustainability awareness and skill enhancement?

We have developed innovative educational models and partnerships to promote sustainability awareness and enhance skills in rural and underserved communities. Our initiatives are scalable and adaptable, ensuring meaningful impacts across diverse regions. A key example is the eXiT Learning Model, part of our flagship Project eXiT in Assam. This model combines theoretical knowledge with practical experience, integrating sustainability principles into a curriculum focused on agriculture, entrepreneurship, and technology. Local participants, including schools and businesses, learn about sustainable farming practices such as organic farming and water conservation while gaining skills in digital literacy and business management.

We collaborate with local universities and technical institutes like Assam Skill University and Cardano Foundation to provide access to workshops on renewable energy and AI-powered farming. By bringing experts into rural communities, we expose participants to the latest technological trends, empowering them to innovate relevant solutions.

Our impactful Farmer Field Schools (FFS) model focuses on peer-to-peer learning and demonstration plots, where farmers can witness sustainable practices firsthand. Participants learn to use IoT devices for soil health monitoring and implement drip irrigation systems. Recognising geographic isolation as a barrier to education, we are launching digital platforms for remote learning, offering online courses accessible on low bandwidth connections. We closely collaborate with NGOs and government programs to align our initiatives with national sustainability and skill development goals, ensuring that individuals in rural communities are equipped to drive sustainable development actively.

## 13. As a strategist passionate about innovation and decentralization, how do you balance the commercial objectives of your projects with Kolong Foundation's commitment to environmental sustainability?

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Balancing commercial objectives with a commitment to environmental sustainability is integral to our strategy. We prioritise long-term impact over short-term gains, embedding sustainability into our core business model from the outset. In sectors like agriculture, healthcare, and entertainment, we evaluate every operational decision against its environmental impact. A prime example is Project eXiT, where our activities—from food services to local crafts—are grounded in eco-friendly practices, such as sustainable sourcing and waste reduction. We leverage decentralized technologies to create economic models that promote local production systems and blockchain transparency, fostering local entrepreneurship while upholding our environmental goals. Adopting a circular economy approach further enhances our strategy, minimising waste and promoting recycling. For instance, in Project eXiT, organic waste is composted to support local agriculture, creating a beneficial feedback loop. Ultimately, our focus on renewable energy and resource efficiency drives long-term profitability while minimising our environmental footprint.

### 14. What are some of the most successful initiatives you have led at Kolong Foundation that have integrated environmental sustainability with entrepreneurship or economic empowerment?

We have successfully integrated environmental sustainability with entrepreneurship and economic empowerment, fostering eco-conscious communities. Our flagship initiative, Project eXiT in Nagaon, Assam, exemplifies this approach. It has established a community-driven ecosystem where local food entrepreneurs, artisans, farmers, and small-scale businesses operate sustainably. We provide microfinance, business training, and access to renewable energy sources like solar-powered stalls, enabling them to grow while minimizing their carbon footprints. Our practices include waste management, composting food waste, and reducing plastic usage.

In collaboration with local farmers, we promote sustainable agricultural practices using organic methods and IoT-powered precision agriculture. By integrating blockchain technology for supply chain transparency, we ensure fair prices for farmers while encouraging eco-friendly farming that conserves water and reduces pesticide use. This initiative enhances food security and

empowers farmers by connecting them directly with consumers, eliminating middlemen.

Our Solar Entrepreneurship Program trains local entrepreneurs to install and maintain solar panels, creating businesses that provide renewable energy to rural areas. This program addresses energy access issues, creates jobs, and promotes economic self-reliance. We also tackle water scarcity through the Water Conservation and Empowerment Program, teaching rainwater harvesting and drip irrigation. By promoting efficient water use, we help communities enhance agricultural productivity while generating economic opportunities for water management services.

Through these initiatives, we demonstrate that environmental sustainability and economic empowerment can coexist, contributing to community growth while safeguarding the environment for future generations.

### 15. How do you envision Kolong Foundation's role in shaping sustainable business practices across sectors like technology, healthcare, and entertainment over the next decade?

I envision the Kolong Foundation playing a pivotal role in shaping sustainable business practices across sectors over the next decade. In the technology sector, as the world becomes increasingly digital, I will leverage disruptive technologies like AI, IoT, and blockchain to create scalable and sustainable business models. For instance, we plan to expand IoT-based precision farming techniques to enhance resource efficiency while minimising environmental impacts. Blockchain will ensure transparency in supply chains, empowering consumers to make informed, sustainable choices.

In wellness and healthcare, my commitment lies in developing solutions that grant rural populations access to quality care while minimising environmental costs. By combining IoT for remote monitoring with AI-powered diagnostics, I aim to make healthcare more accessible and sustainable, particularly in underserved regions.

The entertainment industry offers significant opportunities to drive sustainable cultural change. Through our flagship initiative, Project eXiT, I will create spaces where sustainable business models intersect with entertainment, food, art, and culture, developing eco-friendly hubs that operate on renewable energy. These platforms will promote sustainability awareness





through various interactive experiences.

Ultimately, my goal is to act as a catalyst for collaboration between industries, governments, and civil society. By fostering partnerships that bridge technology, healthcare, and entertainment, I seek to create a cohesive strategy for sustainable development, ensuring businesses contribute to a more sustainable future through circular economy principles. Our future lies in expanding decentralized, tech-enabled models, building an innovative, inclusive, and impactful sustainable ecosystem.

### 16. How do you engage with international stakeholders, including governments, NGOs, and corporations, to align Kolong Foundation's efforts with global sustainability goals, such as those set at COP29?

One of our esteemed advisors, Ms. Anwesha Nath, is a member of the United Nations Framework Convention on Climate Change youth and child constituency. She has actively participated in various international UNFCCC events, including COP28 and the Regional and Local Conferences of Youth. Recently, she was invited by the Azerbaijan Government to represent youth at COP29. Her notable achievements include developing a carbon emissions tracking app, which received recognition at the RCOY MENA and was awarded the Creative and Sustainable Solutions award at LCOY UAE. Anwesha's ongoing efforts are pivotal in driving youth engagement in climate action, particularly through organising Local Conferences of Youth across the Middle East.

We believe engaging with international stakeholders is essential for aligning our efforts with global sustainability goals outlined by significant frameworks like COP29. Our approach is founded on key principles, including building multi-sectoral partnerships. We collaborate with governments, corporations, NGOs, and international organisations to co-develop innovative solutions for pressing issues such as climate change, poverty, and social equity.

Additionally, we leverage global platforms for advocacy, using forums like COP29 to showcase successful projects, such as our eXiT initiative in India, which illustrates how local entrepreneurship and green technologies effectively tackle global challenges. Our initiatives are intentionally structured to contribute to several UN Sustainable Development Goals (SDGs), including climate action, quality education, gender equality, and decent work. This alignment ensures our work resonates with international stakeholders and meets established benchmarks for sustainable development.

We also prioritise policy advocacy by shaping sustainable development policies at local and national levels, advocating for renewable energy adoption and sustainable agriculture practices. Our commitment to showcasing our impact through data and case studies fosters trust and encourages collaboration, clearly demonstrating the real-world benefits of our initiatives and enhancing opportunities for meaningful partnerships.



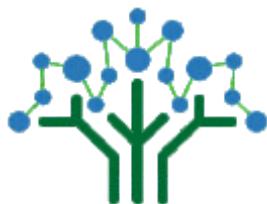
## TRANSFORMING SUSTAINABLE GROWTH WITH IOT, AI, BLOCKCHAIN

### 17. What advice would you offer to other business leaders looking to transition from commercial pursuits to social impact-driven initiatives?

For business leaders transitioning to social impact-driven initiatives, aligning purpose with profit is crucial. Today's businesses can achieve financial success while creating social value. Starting small with manageable projects, like our Project eXiT in Nagaon, Assam, allows for sustainable scaling and demonstrates

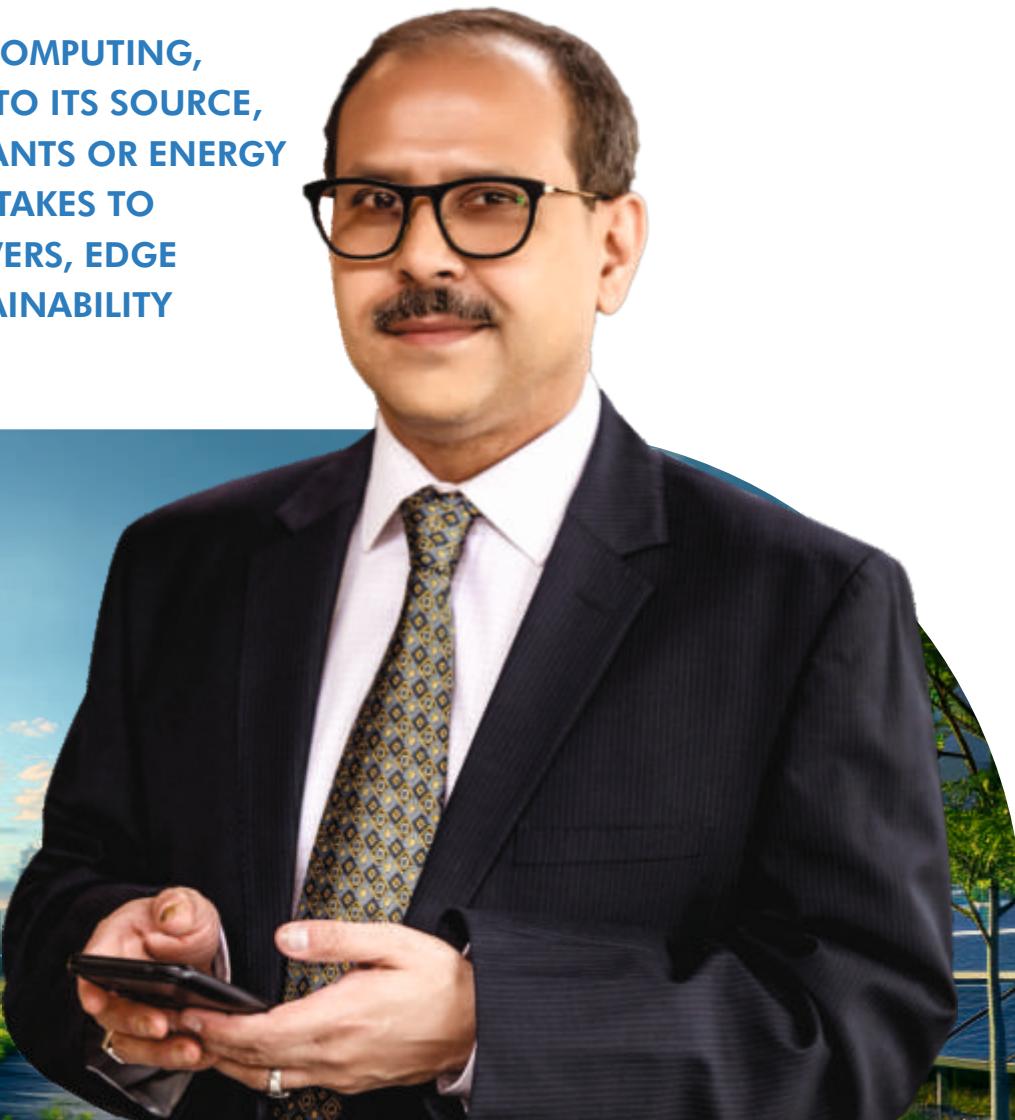
integration of sustainability. Leveraging technologies such as IoT, AI, and blockchain enhances transparency and impact. Engaging local communities is essential; initiatives are most effective when co-designed with those affected, fostering trust and ownership. Measuring success through robust frameworks focusing on social and financial outcomes ensures accountability. Embracing long-term thinking is vital; social impact is a journey, not a quick win.





**Green Computing  
Foundation**

**INNOVATIVE SOLUTION IS EDGE COMPUTING, WHICH PROCESSES DATA CLOSER TO ITS SOURCE, SUCH AS IN MANUFACTURING PLANTS OR ENERGY GRIDS. BY REDUCING THE TIME IT TAKES TO TRANSMIT DATA TO CENTRAL SERVERS, EDGE COMPUTING CAN SPEED UP SUSTAINABILITY REPORTING.**



### **Dr Niladri Choudhuri**

President,  
Green Computing Foundation

- 1. What are the challenges of data collection, integration, and validation in sustainability reporting that you see, and how do you handle them?**

Sustainability reporting is increasingly becoming a critical component for businesses, but it faces several challenges, particularly in data collection. Most sustainability data comes from decentralised sources across various departments like energy consumption, waste management, water usage, supply chains, and carbon emissions tracking. For example, collecting data on Scope 3 emissions, which

includes emissions from both upstream and downstream supply chains, is particularly complex. Many companies rely on suppliers or customers to provide this data, and ensuring its accuracy is a major challenge.

Moreover, much of the data collected is unstructured—taking the form of manual entries in spreadsheets, PDFs, emails, and even verbal reports. This lack of standardisation makes it difficult to validate and integrate the data into meaningful sustainability reports.

To tackle these issues, companies are



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increasingly adopting data integration platforms such as ERP systems or sustainability management platforms that allow the consolidation of data from disparate sources. These systems automate data capture and ensure that all information is integrated into a unified system. Blockchain technology is also being used to validate and secure the authenticity of data, making it easier to track and verify its source. Additionally, IoT sensors are being deployed in operations to collect real-time data in a structured format, reducing manual work and improving data quality.

Furthermore, many companies are now investing in AI and machine learning algorithms to extract useful information from unstructured data. For instance, natural language processing (NLP) models can process emails, PDFs, and other text documents to identify relevant sustainability metrics, normalising the data for better accuracy. This minimises human error and ensures data consistency across various reporting frameworks, such as the Global Reporting Initiative (GRI) or the Corporate Sustainability Reporting Directive (CSRD).

### 2. How do you address issues of data accuracy and quality?

Ensuring data accuracy and quality is one of the most significant hurdles in sustainability reporting. The problem often stems from inconsistent data standards across different industries and geographies. For example, the definitions of sustainability metrics can vary significantly between companies or countries, making it challenging to produce comparable data. Moreover, when data is manually entered, the potential for human error increases, especially when dealing with large datasets. Additionally, many organisations face historical data gaps, meaning they lack comprehensive information on past sustainability performance.

To overcome these challenges, companies should implement a robust data governance framework. This involves standardising the definitions of sustainability metrics across the organisation and ensuring consistent data capture methods. These frameworks help to ensure that only relevant, clean data is captured, reducing the risk of errors. Data governance should also involve ongoing audits and checks to identify any discrepancies or issues in the data.

Additionally, using Blockchain technology is becoming increasingly popular for ensuring data integrity. Blockchain allows for the secure,

tamper-proof storage of sustainability data, which can be critical for industries where transparency and accountability are essential. For example, companies in industries like agriculture or manufacturing can use blockchain to track the environmental impact of their supply chain from start to finish.

In terms of validating data, companies can employ advanced analytics tools and data validation algorithms. These tools are designed to identify outliers, anomalies, and inconsistencies in datasets. For instance, if a company reports a significant decrease in energy consumption without a corresponding change in operations, the validation tools would flag this for further investigation.

### 3. How do you manage the timeliness of sustainability data?

One of the main issues with sustainability reporting is the delay in data collection and reporting. Sustainability data often lags behind operational processes, with many companies only updating their sustainability reports on a quarterly or annual basis. This lag makes it difficult to implement real-time improvements and can result in missed opportunities for reducing environmental impact.

To address this, companies are increasingly turning to real-time dashboards that track sustainability metrics as they are generated. These dashboards allow decision-makers to view



up-to-date data on key sustainability indicators, such as energy usage, carbon emissions, or waste production. Real-time data allows for more proactive decision-making, enabling companies to respond quickly to issues as they arise. For example, if a company's energy consumption spikes unexpectedly, real-time data can help identify the cause and address the

# SUSTAINABILITY REPORTING: DRIVING ACTIONABLE INSIGHTS

problem immediately. Another innovative solution is edge computing, which processes data closer to its source, such as in manufacturing plants or energy grids. By reducing the time it takes to transmit data to central servers, edge computing can speed up sustainability reporting. For instance, energy usage data from a factory can be processed locally, allowing managers to receive immediate updates on their sustainability performance.

Additionally, companies are implementing automation tools to collect and report data in real-time. By automating the data collection process, companies can minimise the delays associated with manual data entry and reporting. This helps to align sustainability goals with actual operations, enabling companies to track their progress more effectively.

## 4. How do you ensure data security and privacy in sustainability reporting?

Data security and privacy are growing concerns in sustainability reporting, particularly when companies are required to share sensitive data with external stakeholders, such as third-party auditors, regulators, or customers. This introduces several risks, including potential data breaches, cyberattacks, and the unauthorised use of proprietary information.

To mitigate these risks, companies are employing encryption technologies to secure data both at rest and in transit. Encryption ensures that even if data is intercepted, it cannot be read without the correct decryption key. Additionally, Identity and Access Management (IAM) systems are used to control who has access to specific data. These systems provide a higher level of security by ensuring that only authorised personnel can access sensitive information.

Furthermore, the implementation of secure collaboration platforms allows companies to share sustainability data with external partners without compromising security. These platforms often feature role-based access controls, which limit who can view or edit specific data. The growing use of DevSecOps practices ensures that security is integrated throughout the lifecycle of sustainability data management, from collection to reporting.

Finally, companies must remain compliant with global data privacy regulations, such as the General Data Protection Regulation (GDPR) in Europe, which mandates strict controls on data handling and sharing.

## 5. How do you handle complex and changing

### regulatory requirements for sustainability reporting?

The regulatory environment surrounding sustainability reporting is constantly evolving, and staying compliant with these changes is a significant challenge for many organisations. Different regions have their own reporting requirements, such as the EU's Corporate Sustainability Reporting Directive (CSRD) or the Global Reporting Initiative (GRI) standards. This variability can make it difficult for multinational companies to ensure their reports are fully compliant across all jurisdictions.

To manage this, companies are turning to regulatory compliance tools that automatically align sustainability reports with the latest regulatory standards. These tools can adapt to changing regulations, ensuring that reports are always up-to-date and in compliance with local laws. Furthermore, companies are increasingly adopting automated reporting systems that generate standardised reports, making it easier to comply with multiple frameworks simultaneously.

For instance, many companies find that 60-70% of the data required for reporting is common across different standards. By focusing on improving the quality and accuracy of this data, companies can streamline the reporting process, ensuring that they can quickly adapt to new regulations without having to start from scratch.

## 6. How do you maintain data transparency and traceability?

Transparency and traceability are critical to building trust with stakeholders in sustainability reporting. However, ensuring transparency across the entire lifecycle of products and services is no small task, particularly when supply chains involve multiple vendors, regions, and regulations. The challenge is compounded by the risk of greenwashing, where companies may unintentionally—or sometimes intentionally—overstate their sustainability achievements.

To maintain transparency, companies are turning to supply chain management software that tracks sustainability metrics at every stage of the supply chain. This ensures that companies can monitor the environmental and social impact of their suppliers, from raw material extraction to final product delivery. By providing real-time insights into supply chain sustainability, these tools make it easier to produce transparent and accurate reports.

Additionally, Blockchain technology is being used to enhance traceability in supply chains. Blockchain provides a secure, decentralised



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record of every transaction in the supply chain, ensuring that sustainability data is tamper-proof. This technology is particularly useful for industries like agriculture, manufacturing, and retail, where consumers are increasingly demanding transparency in the sourcing of products.

### 7. How do you manage the volume and complexity of sustainability data?

As companies collect more sustainability data, managing its volume and complexity becomes a growing challenge. Large organisations generate data from a variety of sources, including finance, operations, HR, and supply chains. This data is often stored in different formats, making integration and analysis difficult.

To manage this, companies are moving towards cloud-based data storage solutions, which provide the scalability needed to handle large datasets. Cloud platforms allow companies to store vast amounts of data without the need for costly on-premises infrastructure. Additionally, cloud systems are often equipped with data analytics tools that can process and analyse large datasets, providing valuable insights into sustainability performance.



By using these tools, companies can not only manage their data more effectively but also extract meaningful insights that can drive their sustainability strategies. For example, advanced analytics can predict future sustainability outcomes, such as energy consumption or carbon emissions, allowing companies to plan for long-term improvements.





**GNFZ offers independent, third-party net zero certification with a universal framework that enables buildings (both new and existing), portfolios, and businesses to measure and reduce their Scope 1, 2, and 3 emissions in alignment with the Paris Agreement.**



## MAHESH RAMANUJAM

PRESIDENT & CEO

Mahesh Ramanujam, Co-Founder, President, and CEO of the Global Network for Zero (GNFZ), is a visionary leader who has been at the forefront of the global sustainability movement, particularly in the realm of green building and net zero certification. With over two decades of leadership across both nonprofit and for-profit sectors, Mahesh has consistently driven transformative change, helping businesses, communities, cities, and buildings meet their ESG and decarbonization commitments. His previous roles as President and CEO of the U.S. Green Building Council (USGBC), Green Business Certification Inc. (GBCI) and the global technology platform Arc solidified his reputation as an architect of globally recognized green standards, including the enhancement of the LEED rating system, which

now incorporates rigorous decarbonization and health standards. He also served as the Chair of the Board of GRESB. Under his guidance, GNFZ offers independent, third-party net zero certification with a universal framework that enables buildings (both new and existing), portfolios, and businesses to measure and reduce their Scope 1, 2, and 3 emissions in alignment with the Paris Agreement. In this interview, Mahesh shares his insights on overcoming barriers to achieving a zero emissions future, the urgency of climate action, and his mission to make net zero goals accessible and achievable for all. His commitment to a data-driven, flexible approach has made him a respected thought leader in the global fight against climate change.

## UNLOCKING GLOBAL NET ZERO SOLUTIONS

### 1. The Vision Behind Global Network for Zero

#### a. Can you share the founding vision behind Global Network for Zero and how it addresses the critical need for net-zero emissions in today's climate?

The Global Network for Zero (GNFZ) was founded to make net zero emissions accessible, affordable, and achievable for all, offering a one-solution-fits-all framework that supports businesses, governments, and organizations of any size. By providing certification and clear guidance, GNFZ addresses the critical need for urgent climate action, helping entities reduce carbon emissions while ensuring accountability and measurable progress toward a sustainable future. As the world's leading net zero certification body, GNFZ is dedicated to overcoming traditional barriers to decarbonization. Our mission is to empower individuals and organizations to embark on their sustainability journeys from any starting point and work toward achieving net zero. We emphasize the importance of incrementalism, which we believe is crucial in making net zero attainable for everyone.

Our comprehensive platform enables organizations to calculate their building, portfolio or business' Scope 1, 2, and 3 emissions, identify effective strategies to reach their targets sooner, certify their net zero achievements, and receive ongoing support throughout the process. We are actively working with clients across the U.S., India, Latin America, Europe, the Middle East, and Asia to transition them to net zero.

#### b. What inspired you to transition from your leadership roles in the U.S. Green Building Council (USGBC) and Green Business Certification Inc. (GBCI) to founding GNFZ?

My experiences with USGBC, GBCI, Arc and GRESB played a pivotal role in shaping GNFZ's approach to effective market transformation. We noticed the issues that the market was facing in implementation and created our product to break down these barriers. However, we didn't want to release just another program or replicate what others were doing: We aimed to create something that could scale and bring about lasting change.

When founding GNFZ, we first conducted market research to identify the unique value proposition we could bring to the existing buildings market. We had extensive

conversations with trusted veteran industry leaders and carefully listened to the issues they were grappling with. What we heard was that progress wasn't hindered by a lack of technology or programs, but rather a lack of ROI data to make the business case for transitioning existing buildings to net zero, along with a realistic roadmap they could leverage to accelerate their progress over time.

This led us to build a network of like-minded professionals working together to accelerate a zero emissions world. We knew we needed to create a platform with data built into it from the beginning, serving as the driving force to start building that ROI story. As a result, we have curated our platform and certification to address the specific issues these professionals face in implementing sustainable practices. And since the successful launch of the existing building certification, we have also launched certifications to address the new construction market, portfolios and business operations as well due to requests from the market.

### 2. Barriers to Decarbonisation

#### a. What are some of the most significant barriers you've seen businesses face in their journey toward net-zero, and how does GNFZ help them overcome these hurdles?

The biggest hurdles continue to be planning and implementation. We haven't seen many credible net zero transition plans yet, especially ones that take an honest accounting of Scope 3 emissions (this is one of the biggest value propositions of GNFZ and our global network of experts). As more projects go through our platform, we'll use that data to demonstrate what a successful plan entails. On the implementation side, we're seeing commitments to net zero, but progress is slow. This is evident with buildings – only about 0.23% of buildings worldwide are net zero. It's a stark reminder of how far we have to go.

There are other issues too. Upfront investment costs are a barrier for many businesses, especially in attaining experienced subject matter experts. Many companies lack in-house expertise to plan and execute net zero strategies. Making the business case is also tough since we still don't have great ROI data. Carbon accounting is another problem area. Dealing with supply chain emissions (Scope 3) is another hurdle as value chain emissions are harder to control. Many companies also deal with internal stakeholder resistance which can

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slow progress. And there are inconsistencies in methodologies, which can lead to confusion.

If you're getting started, I always recommend using the Greenhouse Gas (GHG) protocol to conduct an emissions inventory so you can begin to put together a quality strategic plan.

GNFZ helps businesses overcome decarbonization barriers by providing a clear, structured framework that is adaptable for organizations of any size. We offer practical tools and certification processes that make the path to net zero both accessible and achievable. GNFZ also supports companies by fostering collaboration, offering expert guidance, and ensuring accountability through measurable milestones.

**b. Given your extensive experience in both nonprofit and for-profit sectors, what are the key differences in how these sectors approach ESG and net-zero targets?**

Both of these sectors play important roles in tackling ESG and net zero targets. Ideally, these two sectors should complement each other working off their respective strengths. Nonprofits promoting ESG and net zero strategies benefit from institutional good-will because of the perception that they are approaching and advancing these critical issues without regard to financial gain. They are able to frame their work as part of their mission. The for-profit sector, I believe, is able to adapt much more quickly to the rapidly changing needs of the market as there is far less bureaucracy and internal barriers to change. I also believe that purpose-driven for-profit companies operating in this space, like GNFZ, care about solving the climate crisis as much as those in the not-for-profit space.

**3. Independent Certification and the GHG Protocol**

**a. GNFZ offers independent certification based on the GHG Protocol. How does this framework provide flexibility for businesses and communities to meet their Scope 1, 2, and 3 emissions goals?**

GNFZ's independent certification, based on the GHG Protocol, provides businesses and communities with a flexible framework to address Scope 1, 2, and 3 emissions by offering tailored guidance suited to their specific operations. This approach allows organizations to adapt strategies that fit their unique carbon footprint, making it easier to track and reduce

direct, indirect, and value-chain emissions. By focusing on transparency and providing clear action steps, GNFZ helps entities meet their emissions goals efficiently, regardless of size or industry.

**b. What are the core components of the GNFZ certification process, and how does it ensure credibility and transparency for businesses aiming for net-zero?**

Our core components of the certification process include 3 phases:

1. Initiate: Conduct an assessment and develop a plan to reach net zero emissions.
2. Implement: Implement strategies, achieve milestone certificates along the way and ultimately reach net zero status.
3. Sustain: Submit annual documentation to maintain your net zero status.

We rely on third-party reviewers to ensure accuracy of project submissions, to check a project's documentation against GNFZ's guidelines upon submission, and certify the project's net zero status. Reviewers are compensated based on a project-by-project fee.

**4. Incremental Progress Toward Net Zero**

**a. Unlike the "all or nothing" approach, GNFZ advocates for incremental progress. Can you explain how this approach benefits businesses and accelerates the journey to net-zero?**

One of the major advantages of GNFZ is our incremental approach to achieving net zero emissions. This means that, regardless of the scale or size of a business, we guide each project along a phased journey that initially focuses on low-hanging fruit — those changes that yield maximum gains with minimal investment. By targeting these quick wins first, organizations can start seeing results almost immediately, which builds momentum and fosters a culture of sustainability.

From there, we work with businesses to develop a comprehensive roadmap that addresses all areas of emissions, ensuring cost-effectiveness and delivering a solid return on investment. This strategic, step-by-step process allows companies to implement changes at a pace that suits their unique circumstances while making meaningful progress toward their net-zero goals. By breaking down the journey, we empower businesses to innovate and adapt, ultimately accelerating their transition to a sustainable future.

## UNLOCKING GLOBAL NET ZERO SOLUTIONS

- b. **How do your benchmarks throughout the certification process help businesses demonstrate measurable progress to their stakeholders?**

Our milestone certificates help recognise and celebrate the milestone achievements of a project or organisation throughout its decarbonisation journey which helps them community to their stakeholder community of their progress in the net zero direction.

### 5. Technology's Role in Achieving Net Zero

- a. **As someone with a technology background from your time at IBM and Lenovo, how does technology play a critical role in GNFZ's mission to decarbonize the economy?**

It goes without saying that technology plays a critical role in every industry. Sustainability is no different. We are bringing in the best practices from latest technological advancements to bring cutting edge solutions for our clients' businesses to accelerate their net zero journey. Our platform which is a simple data driven tool calculates all scope emission data and helps establish the net zero road map and keeps the project team updated of the net zero progress throughout the journey.

Additionally, we have also partnered with technology solution providers that use AI and blockchain to help assess and analyse gaps in a project or use their tools for better air quality for example. Together we are able to join hands and offer the best possible solutions to our clients and help in our country's net zero goals.

- b. **Can you talk about GNFZ's cloud-based platform and how it facilitates collaboration and accelerates the elimination of emissions?**

Our platform is an open access tool that lets project team members from the client side or the consultant side join the project online on the platform and thus fosters transparency and collaboration among all the stakeholders involved throughout the net zero journey thereby helping in acceleration.

### 6. Universal Framework and Flexibility

- a. **One of the strengths of GNFZ is its universal framework that allows businesses to choose their standards. How does this flexibility cater to different industries and regions with varying sustainability goals?**

Our certification process is tailored to consider

industry or region-specific factors such as local climate, energy needs, and infrastructure, ensuring that net-zero strategies are both realistic and impactful. While the overall approach remains consistent, we customize benchmarks for emissions, renewable energy, and efficiency based on specific projects and regional conditions. This adaptability empowers businesses across diverse environments — from arid regions to coastal areas — to implement effective, regionally adapted decarbonization strategies.

At GNFZ, we've designed our platform with flexibility at its core, ensuring our pathways remain adaptable to changing climate policies and emerging technologies. We maintain a constant feedback loop with our users and industry experts, allowing us to rapidly evolve our offerings as needed.

To further enhance our offerings, we've established an advisory group of top global sustainability leaders. Their insights and deep expertise help us maintain a forward-focused approach, allowing us to anticipate changes in the sustainability landscape. This combination of a flexible platform, rapid development cycles, and expert guidance ensures that we provide our users with up-to-date, adaptable pathways that reflect the latest in sustainable practices and technologies.

- b. **How does GNFZ ensure that this flexibility doesn't compromise the integrity and rigor of the certification process?**

GNFZ maintains alignment with globally recognized standards and frameworks, such as the GHG Protocol. Doing so provides a robust foundation for assessing and verifying emissions reductions, ensuring that all certified businesses adhere to the highest international benchmarks.

While GNFZ customizes benchmarks to accommodate regional conditions—such as variations in climate, energy resources, and infrastructure—the core requirements of the certification process remain steadfast. These include stringent criteria for transparency, accountability, and measurable progress, which are essential for maintaining trust among stakeholders.

Independent verification plays a crucial role in this process, as it involves third-party assessments to confirm that businesses are accurately reporting their emissions and progress toward their net-zero goals. This independent oversight not only bolsters credibility but also provides an additional layer

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of assurance that companies are genuinely committed to their sustainability objectives.

Regular reporting is another vital component of GNFZ's approach, allowing businesses to share their progress with stakeholders consistently. This ongoing communication fosters accountability and encourages organizations to stay on track with their decarbonization efforts.

By upholding these rigorous standards and practices, GNFZ ensures that, despite the necessary flexibility to address diverse regional needs, the integrity of the certification process remains intact. This commitment to excellence not only supports individual businesses in their sustainability journeys but also contributes to the collective effort of achieving meaningful climate action on a global scale.

### 7. The Urgency of Climate Action

- a. **Global 2050 net-zero targets have been criticized for not being ambitious enough. How does GNFZ drive urgency and action to accelerate progress toward zero emissions before 2050?**

To drive both urgency and action, we encourage businesses to adopt more aggressive interim targets. We provide a robust certification framework that supports organizations in developing actionable, short-term plans that lead to measurable emissions reductions. By leveraging tailored benchmarks and resources, businesses can immediately identify and implement strategies to reduce their carbon footprint.

Additionally, GNFZ fosters collaboration among stakeholders, creating a community that shares best practices, innovative solutions, and lessons learned. This collaborative environment accelerates the exchange of ideas and drives collective action toward faster decarbonization.

Furthermore, we engage with stakeholders to advocate for stronger regulatory frameworks and incentives that facilitate rapid transitions to sustainable practices. By aligning our efforts with broader climate initiatives, we work to amplify the urgency for action and inspire businesses to take meaningful steps now. Ultimately, our goal is to create a sense of accountability and momentum that propels all sectors toward achieving net-zero emissions well before the Paris Agreement targets.

- b. **What role do you see GNFZ playing in shaping global policies and business practices to ensure faster and more**

### effective climate action?

I see GNFZ playing a pivotal role in shaping global policies and business practices by acting as a bridge between businesses, governments, and communities. Our goal is to create a unified framework for achieving net-zero that is both flexible and rigorous, ensuring it works for different industries and regions. By aligning with globally recognized standards like the GHG Protocol and advocating for stronger climate regulations, we help businesses integrate meaningful decarbonization strategies into their core operations.

Through collaboration with stakeholders, we push for supportive regulations that accelerate the transition to net-zero, while also sharing insights from our certified members to inform policy development. Additionally, GNFZ fosters innovation by encouraging the adoption of emerging technologies and practices that drive faster progress. Ultimately, our approach empowers businesses to take meaningful action now, ensuring that climate goals are not just future ambitions but tangible, near-term achievements.

### 8. ESG and Net Zero Commitments

- a. **As ESG compliance becomes a central focus for investors, how does GNFZ help organizations align their ESG goals with net-zero targets, especially in industries like real estate and construction?**

GNFZ plays a key role in helping organizations, particularly in industries like real estate and construction, align their ESG goals with achievable net zero targets. We provide a flexible certification framework that integrates both environmental sustainability and broader ESG criteria into a cohesive strategy. For real estate, this means guiding companies to incorporate energy-efficient design, sustainable materials, and low-carbon technologies into their projects. In construction, we focus on reducing emissions across the supply chain, promoting responsible sourcing, and improving resource efficiency.

By offering clear, measurable benchmarks for reducing Scope 1, 2, and 3 emissions, we help businesses not only meet their net zero targets but also align with investor expectations on ESG performance. Additionally, we provide the tools and reporting mechanisms that ensure transparency and accountability, making it easier for organizations to communicate their progress to stakeholders. Ultimately, GNFZ

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supports businesses in demonstrating their commitment to sustainability, which enhances investor confidence and drives long-term value creation.

**b. How can businesses integrate net-zero strategies into their overall ESG framework to create long-term value for stakeholders?**

Businesses can integrate net-zero strategies into their overall ESG framework by embedding sustainability into the core of their operations, rather than treating it as a separate initiative. First, they need to align their net-zero goals with environmental commitments, such as reducing carbon emissions across Scopes 1, 2, and 3, and optimizing resource efficiency. This ensures that the environmental pillar of ESG is directly linked to decarbonization efforts.

Incorporating net-zero strategies into the social and governance aspects involves prioritizing fair labour practices, community engagement, and transparency in reporting. Companies should provide clear, measurable progress on their net-zero journey, demonstrating accountability to investors, customers, and other stakeholders. By integrating net-zero into their broader ESG framework, businesses not only meet regulatory and market demands but also create long-term value through enhanced reputation, operational efficiency, and future-proofing against climate risks. This approach positions them as leaders in sustainability while building trust with stakeholders.

**9. Leadership and Collaboration**

**a. You've worked with a coalition of leaders across various sectors. How does collaboration with both public and private sector partners help accelerate the decarbonization process?**

Public private partnership is extremely critical to bring a transformative change towards enabling decarbonisation on an eco-system, built environment and infrastructural level. For example, when I was leading USGBC, we introduced LEED for Cities and Communities and Washington DC in USA and Surat in India were among the first to achieve the LEED certification on a city level, so in this case it is essential to work directly with the governmental and municipal bodies as well as private players to enforce and execute such large scale implementation of sustainability measures.

Or take for example DMRC, it was a joint effort by our team at GBCI and Delhi government to

implement the LEED for Transit certification to Delhi Metro.

So private players can contribute with funds, resources, technology and expertise to help public entities implement large scale project on a campus, eco-system, infrastructure or built environment level that'll help citizens at large. Public entities can push in accelerating necessary permissions, city wide data collection, awareness programs and in urban landscaping.

At GNFZ too, we are in talks with government bodies and entities like MNRE to enable decarbonisation on a broader accelerated level.

**10. Your Personal Journey and Leadership**

**a. You've led several high-impact global sustainability initiatives. How has your leadership philosophy evolved over the years, especially in the context of climate action and social equity?**

I have been saying this for a while now, that clean water and air must be basic fundamental rights to all citizens and should be as easily accessible as smart phones are today. I will go a step further and say a decarbonised environment should be as easily accessible as smartphones are today. Only when there is social equity without favouring a few will there be true decarbonisation. And that's exactly the reason why I founded GNFZ to ensure a zero emissions world is accessible to all by enabling all individual and businesses to make their own net zero targets and we'll help them achieve those in a simple, affordable and accelerated way.

**b. Looking ahead, what do you see as the most promising developments in the global pursuit of net-zero, and how will GNFZ be at the forefront of this movement?**

Promising developments in the global pursuit of net-zero includes targeting the hard to abate sectors like steel, oil & gas, global logistics and cement. While there are obviously a lot of challenges and barriers in getting these sectors to reduce and eliminate emissions but there are leaders like ONGC for example in India that is leading the way with LEED certification and innovations being introduced like the use of hydrogen power to cut on emissions. GNFZ is prepared to use the best practices in technological advancements and innovations to get the desired result for decarbonisation in these sectors. The key is what gets measured gets managed so we're going to leverage the data

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available to analyse and assess the fastest route possible for net zero.

### 11. Next Steps for Global Network for Zero

- a. What's next for GNFZ in terms of expanding its certification program and supporting businesses in achieving their net-zero goals?

Our mission is to bring net zero within reach — which means scaling this transformation. So we are working toward accelerating net zero adoption across sectors and particularly in the construction and operation of buildings across the globe.

We will develop a global movement for net zero and build the business case and ROI for net zero. Thankfully, India is making more net zero building progress than any other nation, so we see this as being a huge market and are actively working with projects across sectors and regions here — but we already also have work underway in the U.S., Europe, Latin America, India, the Middle East, and Asia.

A good way of looking at this is to examine how we believe GNFZ's role will be expanding over the next five years:

Currently: Right now, we offer certification for buildings (both new and existing), businesses, and portfolios.

Soon: This will be followed by expanding to cities, communities, materials and products, supply chain, fleet, steel and beyond.

Platform Evolution: On the technical end, to support this growth, we have API integration between other software and our platforms, and we are enhancing the platform capabilities to meet market needs and to provide more robust tools and resources for tracking and achieving net zero goals.

Embracing Partnerships: We are strengthening partnerships with both Indian and international stakeholders to tailor net zero solutions that address local challenges and opportunities across markets. This includes collaborating with governments, the private sector and NGOs to create a cohesive ecosystem for sustainable development. Amplifying Best Practices: Of course, a big part of our work over these next five years will be about amplification and lifting up best practices, case studies and successful projects to show that achieving net zero Scope 1, 2, and 3 emissions is possible—and replicable.

- b. How do you envision the role of GNFZ in helping to build a truly global and inclusive net-zero economy?

I envision GNFZ playing a pivotal role in

building a truly global and inclusive net zero economy by serving as a catalyst for collaboration and knowledge-sharing among businesses, governments, and communities worldwide. Our approach emphasizes flexibility and adaptability, enabling us to address the diverse needs and challenges faced by different regions and industries. By providing a universal framework for net zero certification, we empower organizations of all sizes and sectors to set and achieve meaningful sustainability goals, making net-zero accessible and affordable for everyone.

Additionally, GNFZ is committed to fostering inclusivity by ensuring that smaller businesses and emerging economies have access to the resources and support they need to participate in the transition to net-zero. We believe that collaboration is key: By bringing together stakeholders from various backgrounds, we can create a shared understanding of best practices and innovative solutions that accelerate net-zero progress.

As we work toward achieving net-zero emissions, GNFZ will focus on empowering local leaders and communities to develop tailored strategies that fit their unique circumstances. By promoting a culture of accountability and transparency, we can build trust and encourage widespread engagement in sustainability efforts. Ultimately, GNFZ aims to create an inclusive global movement where every organization, regardless of size or location, can contribute to a more sustainable future for all.

### 12. Inspiration for Future Leaders

- a. What message do you have for the next generation of leaders who are passionate about sustainability and climate action?

To the next generation of leaders passionate about sustainability and climate action: Your time is now. The challenges we face are immense, but so are the opportunities to create real, lasting change. You have the power to reshape industries, rethink how we live and work, and push the boundaries of innovation in ways that my generation could only begin to imagine.

Be bold, stay curious, and never underestimate the impact you can have in your communities. Sustainability is not just about reducing emissions—it's about building a more just, equitable, and resilient world for everyone. Embrace collaboration, take risks, and don't be afraid to challenge the status quo. Your

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leadership will be the driving force that accelerates the transition to a sustainable future.

**b. How can they get involved in GNFZ's work and contribute to the global movement for net-zero?**

GNFZ offers multiple avenues for young climate leaders to make a meaningful impact in the global net-zero movement. You can play a hands-on role in advancing our mission by joining us as a partner, advisor, or even third-party reviewer. Partners collaborate on projects that drive decarbonization across industries. Advisors offer fresh insights to help shape the strategies we develop for different sectors. Third-

party reviewers play a critical role in ensuring the credibility and transparency of our certification process, helping businesses stay accountable and on track.

By engaging with GNFZ in these roles, young leaders have the chance to work alongside industry veterans, policymakers, and innovators, while helping to accelerate progress toward a sustainable, net zero future. Your energy, creativity, and leadership can make a lasting difference in building the global movement for climate action.





**OUR ROADMAP INTEGRATES ADVANCED ANALYTICS WITH ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) PRIORITIES, OPTIMIZING RESOURCE MANAGEMENT, TRACKING ENVIRONMENTAL IMPACTS, AND ENHANCING CLIMATE RESILIENCE.**



**SAURABH RAI**

CEO, ARAHAS TECHNOLOGIES

**1. Leadership and Strategic Vision at Arahas Technologies**

- a. As CEO, how have you shaped the strategic vision of Arahas Technologies to merge geospatial data and AI with sustainability?

Arahas is strategically positioned at the intersection of geospatial data, AI, and sustainability, with a mission to deliver technology-driven insights for meaningful sustainability outcomes. Our roadmap integrates advanced analytics with environmental, social, and governance (ESG) priorities, optimizing resource management, tracking environmental impacts, and enhancing climate resilience. Initiatives such as the City Sustainability Index and the Tree Exchange program actively promote sustainable development and urban resilience.

- b. Can you describe your journey from joining Arahas to leading the company as a global player in the sectors of Smart Cities, Renewable Energy, and ESG?

Since its inception, Arahas has rapidly expanded across sectors including Smart Cities, Renewable Energy, and ESG, addressing global sustainability challenges. Through strategic partnerships with major players like Google, Big 4 consulting firms, and emerging space technology companies, we continue to scale our solutions and drive innovation. Our parent company, EverEnviro, plays a crucial role in supporting our sustainability initiatives and actively participates in global forums such as COP.

**2. Geospatial and AI-Powered Solutions**

## OPTIMIZING URBAN SUSTAINABILITY FOR RESILIENT CITIES

- a. Arahas is known for its AI-powered geospatial solutions. Can you elaborate on how these solutions contribute to tackling global sustainability challenges, such as climate resilience, resource management, and environmental monitoring?

We leverage AI-powered geospatial solutions to tackle critical issues such as land use, agriculture, deforestation monitoring, water resource optimization, and climate risk assessment. Our climate resilience models simulate various scenarios, providing governments and organizations with the tools needed for future risk preparedness. In agriculture, AI-driven insights support precision farming, reducing waste and boosting productivity. We have collaborated with the Indian Meteorological Department in rainfall forecasting.

- b. Could you provide specific examples of how AI and geospatial data have been utilized in key sectors like Agriculture, Utilities, and Defense to drive efficiency and sustainability?

Our technologies have broad applications across various sectors. In climate, we focus on rainfall prediction and reporting. In city sustainability, we conduct end-to-end reporting and prediction of SDF parameters. In agriculture, we predict crop yields and monitor soil health using satellite imagery to promote sustainable practices. For utilities, our

geospatial analysis optimizes the deployment of renewable energy by assessing geographic and climatic factors. Additionally, in defence, AI models aid in terrain analysis, supporting strategic planning and resource management.

### 3. Smart Cities and Sustainable Urbanization

- a. Arahas has made a significant impact in the Smart Cities space. How are your technologies helping cities become more efficient, sustainable, and resilient to climate change?

Arahas is dedicated to enhancing urban sustainability through solutions that optimize infrastructure, manage traffic, and monitor environmental factors like air quality. The City Sustainability Index helps cities measure and improve their sustainability metrics, while our geospatial technology enables efficient waste management and smart resource allocation, contributing to resilient urban environments.

- b. What are the most exciting innovations in smart city development that you believe will shape the future of urban living?

Our City Sustainability Index establishes a baseline for SDG changes and provides an AI-based scorecard. We lead in integrating digital twins with AI for urban planning. These virtual city models allow municipalities to simulate scenarios and predict the impact of infrastructure projects and policy changes. Additionally, our Tree Exchange program



## OPTIMIZING URBAN SUSTAINABILITY FOR RESILIENT CITIES

incentivizes tree planting in urban areas, directly enhancing biodiversity and air quality.

### 4. Sustainability and ESG Integration

- a. With a focus on ESG (Environmental, Social, and Governance), how does Arahas help organizations integrate sustainability goals into their operational strategies?

Our platforms empower organizations to incorporate sustainability into their core operations by providing geospatial insights that identify environmental and social impacts. We streamline the ESG reporting process by automating data collection and analysis to ensure regulatory compliance.

- b. How do you see the role of geospatial technology evolving in helping companies and governments meet ESG targets and drive sustainability reporting?

As sustainability regulations tighten, precise data and transparent reporting become increasingly critical. Arahas' geospatial technology supports real-time monitoring of ESG metrics, enabling companies and governments to achieve their sustainability objectives. Our work in climate risk adaptation helps organizations build resilience against environmental threats.

### 5. Collaboration and Strategic Partnerships

- a. Arahas Technologies is supported by notable strategic partnerships, including with EverEnviro, the Green Growth Equity Fund (GGEF), and others. How have these collaborations enabled Arahas to accelerate innovation in sustainability solutions?

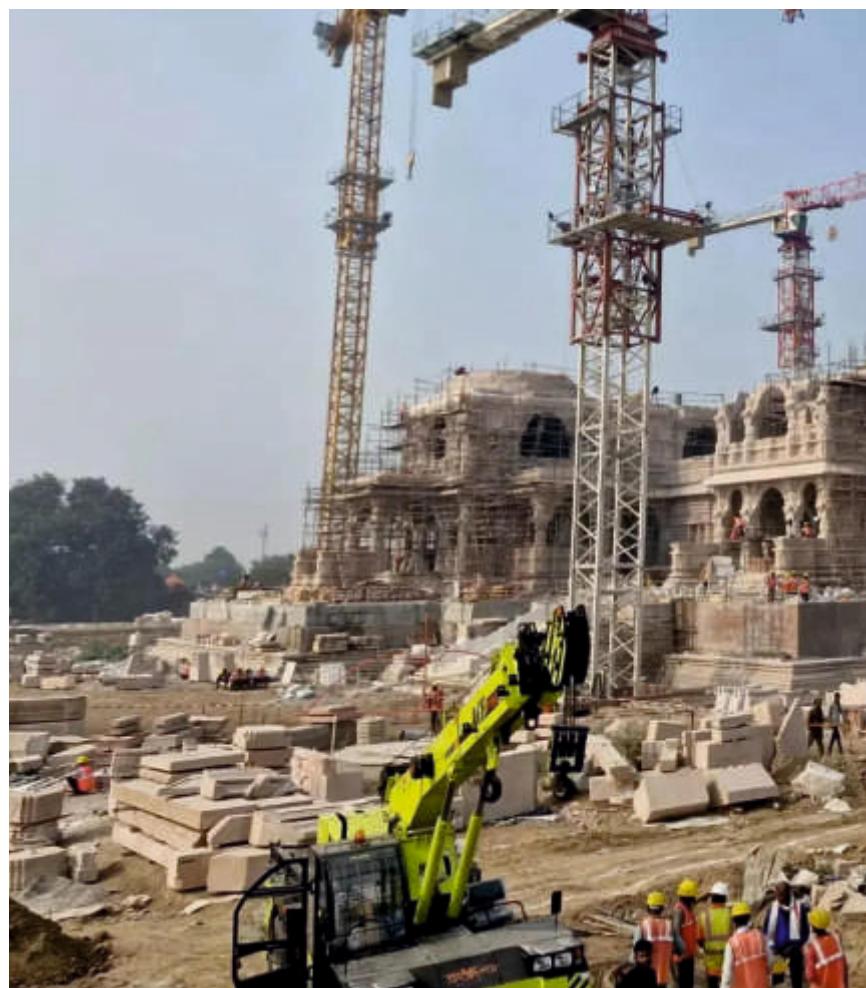
Collaborating with partners like Google, Big 4 firms, emerging space technology companies, and key players such as EverEnviro, GGEF, and sustainability-focused investors accelerates innovation and expands our impact. These partnerships provide diverse expertise and resources, driving the development of cutting-edge solutions to address sustainability challenges at scale.

- b. Could you share some insights on how your relationships with anchor investors like NIIIF, British Petroleum, and the Green Climate Fund have contributed to your company's growth and sustainability mission?

The support of anchor investors such as Eversource, backed by NIIIF, British Petroleum, and the Green Climate Fund, has been instrumental in scaling our solutions. These relationships provide valuable industry insights that shape our growth strategies and drive impactful innovations.

### 6. Technological Advancements

- a. In your opinion, how do geospatial technologies and AI intersect to create innovative solutions for pressing global



issues like climate change, disaster management, and sustainable resource management?

By combining geospatial technologies with AI, we have developed powerful tools for climate change adaptation and disaster management. Our predictive models utilize satellite data to forecast natural disasters and identify climate risks, enabling timely interventions and effective resource allocation.

- b. What are the most disruptive technological innovations that Arahas has introduced recently, and how do you see these developments shaping the future of the industries you serve?

# OPTIMIZING URBAN SUSTAINABILITY FOR RESILIENT CITIES

Our advancements include AI-driven urban planning models and tools for the dynamic monitoring of renewable energy assets. These innovations enhance operational efficiency, support sustainable infrastructure development, and accelerate the transition toward a more sustainable economy.

7. Challenges and Opportunities in the Industry
  - a. What are the key challenges Arahas has faced in scaling geospatial and AI-driven



solutions across industries, and how have you addressed them?

Customizing solutions to fit diverse regulatory and environmental contexts remains a challenge. We address this by developing adaptable technology frameworks and collaborating closely with local partners to deliver tailored solutions.

- b. As the industry evolves, what are the key opportunities that you believe will shape the future of geospatial technology and sustainability in the coming years?

With the increasing global focus on sustainable development, vast opportunities exist for geospatial technologies. Arahas is well-

positioned to support climate action plans, enhance resource efficiency, and drive sustainable growth across various sectors.

## 8. Global Impact of Arahas Solutions

- a. In your opinion, how do geospatial technologies and AI intersect to create innovative solutions for pressing global issues like climate change, disaster management, and sustainable resource management?

In regions like Asia, our technologies advance sustainable development through improved agricultural productivity, optimized urban infrastructure, and climate-resilient planning. The City Sustainability Index, for instance, helps cities benchmark and enhance their sustainability practices.

- b. What are the most disruptive technological innovations that Arahas has introduced recently, and how do you see these developments shaping the future of the industries you serve?

We continue to grow our global footprint by partnering with regional governments and international organizations. Arahas is committed to enhancing our technology stack to address specific local challenges and make a broader impact worldwide.

## 9. COP28, COP29, and Global Climate Commitments

- a. As COP28 was hosted in the UAE, a region where Arahas has strong business roots, how did your company participate in the event's discussions? What were some of the major takeaways or outcomes that influenced your approach to climate solutions?

Arahas supports global climate goals by utilizing geospatial technology, AI, and space-based solutions to enhance climate resilience, optimize resource management, and meet Nationally Determined Contributions (NDCs). Our innovations, such as the City Sustainability Index and climate resilience models, help countries achieve their targets.

## 10. Future of Geospatial and AI Technology

- a. Where do you see the future of geospatial technology and AI heading, especially in the context of global sustainability challenges?

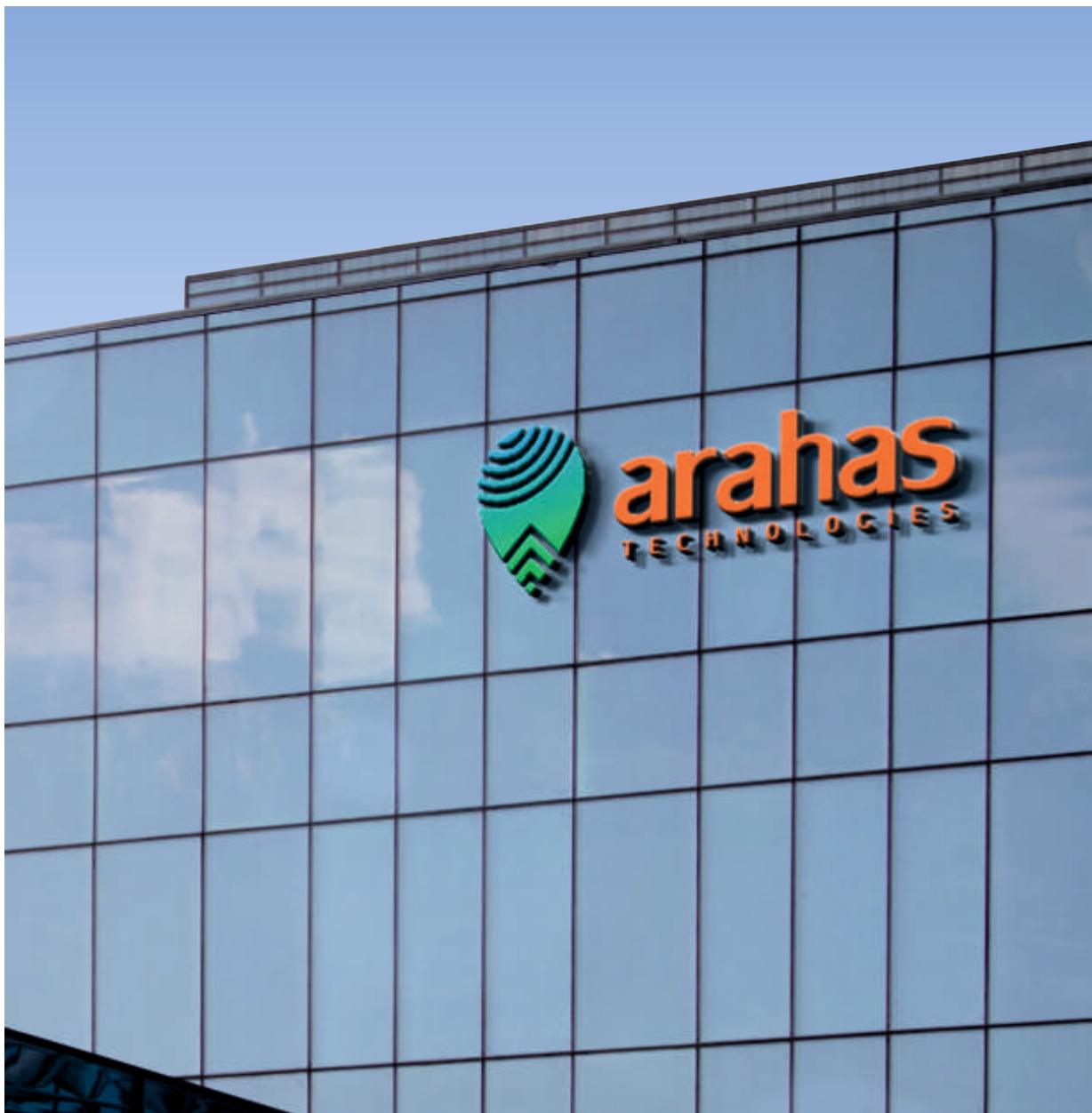
The future of geospatial technology and AI lies in

## OPTIMIZING URBAN SUSTAINABILITY FOR RESILIENT CITIES

deeper industry integration, where sustainability becomes a core operational driver. Real-time data processing and predictive analytics will enhance decision-making and sustainability efforts.

- b. **What can we expect from Arahas Technologies in the coming years in terms of innovation, sustainability solutions, and strategic partnerships?**

Arahas is committed to introducing disruptive solutions that combine AI and geospatial data for greater impact. Our focus on innovation and strategic partnerships will continue to drive the development of new tools and solutions that push the boundaries of sustainability.





a GMEX Group company

**WE ENABLE CREDIBLE CARBON CREDIT SUPPLIERS TO CONNECT WITH BUYERS MORE EFFICIENTLY, HELPING THEM ACHIEVE FAIR PRICING BY REPLACING INEFFICIENT MANUAL PROCESSES.**



**Hirander Misra**  
Chairman & CEO  
ZERO13

**1. Personal & Professional Journey**

**A. Career Background**

- i. **Can you describe your journey in fintech and carbon markets, particularly the milestones leading to the creation of ZERO13?**

My journey in electronic trading and FinTech spans over 28 years, marked by successful syndications, investor engagement, and exits. A significant milestone was co-founding Chi-X Europe, which quickly became Europe's second-largest equities exchange. GMEX Group, ZERO13's parent company, has provided market infrastructure for over 12 years, enabling exchanges globally. Recently, governments and national exchanges approached us about establishing carbon exchanges. We soon realized the need for a solution beyond just exchanges: a

comprehensive, transparent process for carbon credits and ESG assets from source to sale.

The carbon market is highly fragmented, with multiple registries, participants, and exchanges lacking transparency in pricing and provenance. We saw an opportunity to combine my FinTech expertise with sustainability knowledge and our core technology to address these issues. This led to the launch of ZERO13 as a platform-as-a-service two years ago, creating a unique, distributed marketplace that acts as the 'connective tissue' to bridge industry silos and build trust throughout the carbon market ecosystem.

- ii. **What inspired you to combine fintech with climate initiatives, and how do you see your role as CEO of GMEX and ZERO13 evolving over the next few years?**

Our focus is on enabling credible carbon credit

## STREAMLINING CARBON CREDIT TRADING FOR FAIR PRICING

suppliers to connect with buyers more efficiently, helping them achieve fair pricing by replacing inefficient manual processes. This, in turn, positively impacts communities by supporting more climate projects, generating higher income, boosting GDP, and even potentially lowering national debt. Beyond connecting buyers and sellers, our mission includes linking various climate-related services, like carbon calculation, across markets and jurisdictions.

As CEO of ZERO13, my role will evolve to emphasize not only leadership and growth but also collaboration within the industry. Achieving meaningful progress requires a unified approach, leveraging technology to bridge gaps and drive innovation in digital finance and climate fintech. With the world shifting toward sustainable, transparent financial models, we're committed to staying at the forefront, ensuring that we lead this vital transformation.

### B. Key Achievements

#### i. Can you highlight some key milestones that ZERO13 has achieved since its launch, particularly around its award at COP28?

Since its launch, ZERO13 has reached significant milestones that underscore our impact on the carbon market. Our solution's innovative approach to tackling greenwashing and transparency has gained global recognition. A notable highlight was winning the COP28 UAE TechSprint competition for "Innovative Blockchain Solutions in Sustainable Finance to Scale Up Climate Action," awarded for our pioneering technology in sustainable finance. This honor reinforces our commitment to driving technological advancements that benefit the planet.

Recently, ZERO13 was also named "Fintech for Good of the Year" by Fintech Awards London. Such recognition motivates us to continue pushing the boundaries, using Climate Fintech to support global decarbonization and carbon neutrality. We believe in the power of synergy among the four 'Cs': Climate, Communities, Companies, and Countries, supported by another four 'Cs': Code of Conduct, Computing, Coaching, and Capital. Through digitally interconnected collaboration, we're creating positive climate impact across borders, promoting a circular economy, and fostering economic progress, especially in the Global South.

Our approach empowers others to initiate

change in the carbon credit market and other ESG areas, such as biodiversity and water credits, aligning with our vision of a sustainable future.

#### ii. What does being named one of the Top 10 influential business leaders in blockchain technology mean to you, and how has it impacted your approach to leadership?

Being named among the Top 10 influential



leaders in blockchain technology is an incredible honor and a testament to the dedication and innovation of our entire team at GMEX Group and ZERO13. This recognition reflects our collective commitment to advancing digital finance and climate fintech.

It has reinforced my commitment to lead with a clear, adaptable vision, encouraging innovation and collaboration to address both current challenges and future needs. I am now even more focused on creating transparent, efficient markets and bridging gaps in climate finance. This recognition also reminds me to stay humble yet decisive, inspiring and empowering the next generation of leaders in climate fintech as we work together toward a more sustainable and equitable future.



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### 2. ZERO13 & Climate Fintech

#### A. Platform Overview

##### i. How does ZERO13's Platform-as-a-Service (PaaS) differentiate itself from other carbon credits and ESG platforms in terms of technology and services?

ZERO13's Platform-as-a-Service (PaaS) differentiates itself by bridging traditional and decentralized finance through multi-blockchain



interoperability, emphasizing high-integrity carbon credits with real-time pricing, verification, and settlement for complete transparency. Unlike traditional, siloed carbon exchange infrastructures, ZERO13 utilizes a cloud-agnostic horizontal architecture, operating as a "network of networks" that combines both public and private blockchains, with numerous APIs aligned to industry standards.

This hybrid model allows investors in jurisdictions like Singapore to support climate projects in regions such as Ghana, with buyers of the resulting carbon credits, like oil companies, based in the Middle East. As a decentralized market, this platform moves beyond a traditional exchange model, making it ideal for voluntary carbon markets. Moreover,

ZERO13 automates Article 6.2 of the Paris Agreement for Internationally Transferred Mitigation Outcomes (ITMOs), simplifying the complex, often manual country-to-country trading, streamlining processes, and supporting global climate collaboration.

##### ii. Could you explain how the platform leverages AI and blockchain to enhance trust, transparency, and efficiency in the carbon market?

ZERO13 leverages blockchain to establish a verifiable, tamper-proof record for all transactions, securing data integrity and transparency throughout the carbon credit lifecycle—from creation to retirement. This ensures stakeholders can trust the credits' origin and authenticity. By integrating AI-driven digital Measurement, Reporting, and Verification (dMRV) systems, ZERO13 offers real-time insights into emissions reductions and carbon credit transactions, providing visibility across the entire value chain.

This AI-enabled, blockchain-driven infrastructure fosters efficient, transparent, and trustworthy carbon market participation. It helps eliminate inefficiencies and unscrupulous intermediaries, enhancing fair pricing and supporting community-driven project developers. This transparency boosts project viability, creating economic opportunities, especially across Africa, where carbon credits are often undervalued. With ZERO13's approach, climate assets can become valuable export commodities for African nations, supporting national GDP growth, reducing debt, and enabling sustainable development. This model ensures that the economic benefits of climate action extend globally, addressing disparities in carbon credit markets.

#### B. Network of Networks

##### i. What are the advantages of ZERO13's ecosystem approach, and how does it integrate various participants such as exchanges, registries, and custodians?

According to the World Economic Forum, a \$4-5 trillion climate financing gap is impeding climate resilience due to fragmented, siloed, and analogue approaches. ZERO13's distributed hub-and-spoke model addresses this by providing a digital carbon market infrastructure that integrates traditional and digital methods through API and blockchain interoperability. This ecosystem approach allows ZERO13 to

## STREAMLINING CARBON CREDIT TRADING FOR FAIR PRICING

connect international carbon exchanges, registries, custodians, and ESG project owners, facilitating supply verification, transparent pricing, and real-time settlement.

Our platform's unified approach recently won the COP28 TechSprint award for its breakthrough in scaling climate finance. By connecting these critical participants, ZERO13 accelerates progress towards Net Zero by removing inefficiencies and enabling a streamlined, integrated pathway for climate finance that supports global sustainability goals.

**ii. How does ZERO13 address challenges like greenwashing, double counting, and market fragmentation, and how do these solutions impact participants globally?**

ZERO13 tackles market fragmentation, greenwashing, and double counting through a comprehensive, technology-driven model that standardizes voluntary carbon markets. By integrating public and private markets with advanced technology, ZERO13 enhances transparency and efficiency, building trust across the climate value chain and encouraging investments in both community and large-scale projects. The platform's "source-to-sale" transparency mitigates greenwashing risks by verifying each transaction's credibility. Additionally, ZERO13's system prevents reissuance of retired credits, thus proactively safeguarding against double counting. Collaborations with initiatives like the Climate Action Data Trust, supported by the Singapore Government, World Bank, and IETA, further reinforce transparent reporting. Collectively, these measures create a reliable, interconnected global ecosystem, empowering participants worldwide to engage confidently in climate finance.

**3. Market Infrastructure and Integrity**

**A. Role of Exchanges**

**i. In your view, what is the significance of exchanges in ensuring fair trading, settlement processes, and overall market integrity in the carbon and tax credit markets?**

Creating an efficient and fair marketplace for carbon and tax credits relies on a strategic blend of infrastructure, transparency, and trust. Exchanges serve as essential hubs for buyers and sellers, facilitating transparent transactions and effective price discovery. By ensuring that

pricing information is accessible to all participants, exchanges minimize information asymmetry and promote fair competition. Beyond transaction facilitation, exchanges uphold market stability by enforcing standards for fair trading, reliable settlements, and adherence to governance frameworks. These measures protect market integrity and guard against fraudulent activities, thereby fostering trust among participants and enhancing overall market reliability. However, the unique nature of carbon and tax credit markets—largely over-the-counter (OTC) and decentralized—requires a more distributed model than a traditional centralized exchange. A purely centralized exchange construct does not adequately address the decentralized nature of liquidity in these markets. Therefore, a distributed approach is essential to effectively manage liquidity and support the flow of capital between diverse participants. This strategy ultimately creates a sustainable and liquid market environment that aligns with the specific needs of these evolving markets.

**ii. How does ZERO13 work with different marketplaces and exchanges to foster collaboration and liquidity?**

ZERO13 enhances collaboration and liquidity in the carbon credit market by integrating various exchanges, such as SECDEX, through the ZERO13 Hub. This "network of networks" connects carbon exchanges, buyers, custodians, and ESG project owners globally, facilitating efficient investment, trading, and settlement of carbon credits. By uniting diverse participants, ZERO13 creates a larger, more liquid marketplace that fosters transparent pricing and broader access to buyers and sellers, ultimately benefiting both large and small credit holders through increased visibility and streamlined transactions.

**B. Pricing Transparency & Veracity**

**i. Could you elaborate on how ZERO13 ensures transparent pricing mechanisms and veracity in carbon credits?**

ZERO13 ensures transparent pricing mechanisms and the integrity of carbon credits through a rigorous due diligence process that adheres to internationally accepted standards and regulatory guidelines. Each carbon credit listed on the platform undergoes comprehensive verification, aligning with UNFCCC protocols, ISO 14064 standards, and the UN Sustainable Development Goals (SDGs). We offer a menu of verification services, allowing customers to



## STREAMLINING CARBON CREDIT TRADING FOR FAIR PRICING

choose based on their needs while filtering for high-integrity credits to minimize the risk of greenwashing.

Our blockchain technology guarantees complete transparency and immutability from creation to sale, utilizing unique serial numbers for each credit to prevent double counting and ensure traceability. This replaces traditional paper-based systems with tamper-proof records that foster trust. Additionally, ZERO13 collaborates with leading tech providers specializing in Digital Measurement, Reporting, and Verification (DMRV), employing IoT, drones, satellites, and geospatial technologies. This advanced digital infrastructure supports efficient market settlement, reduces manual inefficiencies, and accelerates project onboarding and verification, ensuring a robust ecosystem for transparent reporting and risk assessment in the carbon market.



**ii. How does technology, specifically blockchain, play a role in preventing fraudulent credits and maintaining accurate data?**

ZERO13 employs a cloud-agnostic architecture and a hybrid approach, integrating multiple blockchain interoperability (both public and private) alongside various APIs to ensure data integrity and prevent fraudulent credits. Our ZERO13 Chain, a layer 2 blockchain network, uses a public blockchain for token creation, ensuring external transparency, while a private journaling network manages access and approvals, providing an immutable audit trail.

By partnering with specialist structured products issuers, we offer high-integrity carbon credits structured as securities listed on regulated markets like the Bermuda Stock Exchange and Deutsche Börse. This unique framework leverages globally recognized standards, fostering trust and enabling liquidity growth in voluntary carbon credit markets while ensuring

compliance and accuracy in data management.

### 4. Liquidity and Pooling Mechanisms

#### A. Liquidity Solutions

**i. Liquidity is crucial for a healthy market. How does ZERO13 enable liquidity for carbon credits, especially for smaller credits?**

ZERO13 fosters liquidity for carbon credits by creating a connected and efficient marketplace that aggregates participants, registries, exchanges, and services within the carbon market. This model reduces fragmentation, making it easier for both buyers and sellers—especially those dealing with smaller credits—to access a diverse range of projects and markets through a single entry point. The ZERO13 Hub links carbon exchanges, buyers (including emitters), custodians, and ESG project owners worldwide, facilitating trading and real-time settlement while ensuring transparent pricing and supply verification.

Additionally, our ZERO13 Chain enhances connectivity by enabling interoperability across multiple blockchains and APIs, accommodating various participants regardless of their technological capabilities. By prioritizing high-integrity carbon credits, verified through stringent standards and independent audits, we address greenwashing concerns and build trust in the market. This approach lowers barriers for smaller credit projects, empowering them to find buyers, achieve fair pricing, and actively contribute to global climate action efforts.

**ii. What strategies are necessary to attract a broader range of participants, including brokers, family offices, and retail investors?**

To attract a broader range of participants, including brokers, family offices, and retail investors, ZERO13 employs several strategies. We host webinars, roundtable discussions, and Q&A sessions globally in locations like the UK, Dubai, Singapore, and Thailand, allowing potential investors to connect and learn about our offerings. These events provide insights into market trends, investment strategies, and climate investment products. Additionally, we regularly publish educational articles to inform not just potential investors but also the general public about our initiatives and the challenges we address in the carbon credit industry, fostering a deeper understanding and engagement.



## STREAMLINING CARBON CREDIT TRADING FOR FAIR PRICING

### B. Pooling Mechanisms

#### i. Can you describe the importance of pooling mechanisms in managing smaller tax credits?

Pooling mechanisms are vital for managing smaller tax credits, especially since 80% of the market consists of credits under \$50 million. By aggregating these smaller credits, we create more attractive and manageable investment vehicles that enhance liquidity and facilitate trading. This strategy not only broadens market participation by appealing to a wider range of investors but also mitigates risks through diversification. As a result, pooling mechanisms foster a more stable and appealing investment landscape, benefiting issuers, investors, and the overall economy by encouraging growth and participation in the tax credit market.

#### ii. How does pooling enhance investment opportunities and mitigate risks for investors in both the carbon and tax credit markets?

Pooling enhances investment opportunities and mitigates risks in both the carbon and tax credit markets by aggregating participants, registries, and exchanges into a unified marketplace. This approach increases access to a diverse range of projects and improves liquidity, facilitating easier portfolio management and transparent pricing, thereby reducing exploitation risks.

Rigorous verification processes, including independent assessments, combat greenwashing and ensure that credits reflect genuine emission reductions. Blockchain technology provides transparent, immutable records throughout each credit's lifecycle, minimizing fraud risks. Furthermore, by connecting investors to established exchanges and custodians, ZERO13 reduces counterparty risk and ensures secure asset management, while supporting innovative financial instruments like green bonds and derivatives, offering diverse options for optimizing returns within sustainable finance.

### 5. Ratings, Standardisation, and Aggregation

#### A. Ratings & Standards

##### i. How does ZERO13 employ ratings to assess carbon credits and ESG assets?

ZERO13 adopts an agnostic approach to ratings, recognizing their limitations in assessing diverse carbon projects. By

incorporating multiple rating methodologies, it provides market participants with essential tools to evaluate carbon credits and ESG assets, enhancing trust and transparency in the marketplace and promoting informed decision-making for sustainable investments.

#### ii. What role does standardisation play in creating more sophisticated financial instruments, such as ETFs or carbon-backed bonds?

Standardisation is vital for developing sophisticated financial instruments like ETFs and carbon-backed bonds, especially in the carbon credit market where transparency and trust are essential. It allows investors to gain exposure to underlying assets with confidence. By adhering to uniform standards, carbon credits can be bundled into structured products, facilitating liquidity and scalability. This makes it easier to create, trade, and settle instruments like green bonds and carbon-backed derivatives across various platforms.

At ZERO13, we prioritize standardisation to ensure the credibility and transparency of carbon-backed financial products. Leveraging blockchain technology for digital measurement, reporting, and verification (dMRV), we provide a consistent framework that enhances investor confidence in the underlying value and environmental impact of these instruments.

#### B. Aggregation of Carbon Markets

##### i. How does the ZERO13 Hub aggregate different registries, participants, and exchanges, and how does this enhance market functionality?

The ZERO13 Hub functions as a central orchestration layer that aggregates various registries, participants, and exchanges in the carbon credit market, enhancing overall market functionality. As a distributed Platform-as-a-Service (PaaS), it connects carbon exchanges, buy-side emitters, custodians, and ESG project owners across multiple registries. This integration facilitates real-time trading and settlement of carbon credits, ensuring supply verification and transparent pricing. By leveraging multiple APIs and blockchains through the ZERO13 Chain (Pyctor), we create a unified marketplace that mitigates market fragmentation and greenwashing. The "network of networks" model enhances liquidity, granting access to a broader pool of buyers and sellers, improving price discovery, and streamlining



## STREAMLINING CARBON CREDIT TRADING FOR FAIR PRICING

transactions, ultimately fostering trust and reliability in high-integrity carbon credits.

### ii. How do interoperability and data aggregation contribute to creating a cohesive, global carbon market?

ZERO13 enhances the global carbon market through interoperability and data aggregation, primarily via the ZERO13 Chain (Pyctor). This framework connects various blockchain networks and APIs, ensuring compatibility with diverse technologies used by carbon exchanges, registries, and custodians. This interoperability dismantles silos that restrict market access and impede efficient transactions.

Data aggregation, facilitated by the ZERO13 Hub, compiles information from multiple sources, including international exchanges and ESG project owners. This creates a unified entry point for participants to access comprehensive information on projects, pricing, and transaction data, improving market transparency. Collaborating with initiatives like the Climate Action Data Trust further strengthens this transparency by addressing data integrity.

Together, these elements form a "network of networks," linking participants globally and fostering a more liquid market. This setup enables smaller credit holders to access broader buyer pools, promotes transparent pricing and real-time settlements, and ultimately boosts trust and confidence in the carbon market, driving capital toward climate action initiatives.

## 6. Technological Innovations

- A Blockchain is a decentralized technology by its very nature, which is ideal as a technology to enable the carbon market, which is distributed by nature with multiple siloes. In addition to this it provides the transparency and immutability

needed to build trust in carbon credits by vindicating their provenance. Smart contracts can also be used which can automate the carbon credits lifecycle.

AI plays a pivotal role in enhancing Measurement, Reporting, and Verification (MRV) for carbon credits within the ZERO13 framework. By integrating various MRV methods, including traditional registries and AI-enabled digital Measurement, Reporting, and Verification (dMRV), ZERO13 ensures the integrity of upstream data. This integration allows for the creation of immutable blockchain records for each carbon credit, mitigating risks of greenwashing and preventing double counting or misrepresentation.

With real-time tracking from source to sale, ZERO13 verifies legitimate carbon reduction efforts. The platform utilizes a combination of satellite, drone, and ground sensors to gather data, particularly for nature-based solutions, addressing the complexities inherent in these environments.

In contrast to traditional carbon markets that often suffer from manual processes and siloed data, ZERO13's digital approach guarantees transparency and traceability. By adhering to stringent global standards and leveraging third-party verification, the platform ensures the authenticity and integrity of carbon credits, increasing market efficiency and security.

## B. Cybersecurity

### i. With cybersecurity becoming increasingly important, how does ZERO13 ensure end-to-end operational security for carbon credit transactions?

ZERO13 ensures end-to-end operational security for carbon credit transactions through advanced encryption, continuous monitoring, and multi-factor authentication. Regular security audits and strict access controls safeguard user data and enhance trust in the platform, creating a secure environment for all participants in the carbon credit market.

### ii. What technological advancements are you most excited about that will further enhance the security and reliability of carbon markets?

We're excited about the convergence of IoT, AI, blockchain, and quantum computing, which can significantly enhance the security and reliability of carbon markets. By leveraging these



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technologies, we can improve real-time data collection, analysis, and verification, ensuring the integrity of carbon credits. Additionally, utilizing advanced cloud security from providers like AWS, along with rigorous due diligence, allows us to filter and verify high-integrity carbon credits effectively. This combination of cutting-edge technologies promises to create a more transparent and trustworthy market, mitigating risks associated with greenwashing and enhancing overall market confidence.

### 7. Regulatory Environment & Fraud Prevention

#### A. Stable Regulatory Environment

##### i. How does ZERO13 collaborate with regulators to establish a stable and predictable framework for carbon credits?

At ZERO13, we prioritize collaboration with regulators to create a stable and predictable framework for carbon credits. Our model involves forming joint ventures with local partners after thorough due diligence to ensure their suitability. This localized approach helps us leverage our strengths for project success while establishing on-ground governance that supports high integrity.

By engaging early at both policy and regulatory levels across multiple jurisdictions, we aim to drive regulatory harmonization in global standards, addressing the current market's disparities. Emerging regulations, such as the finalized CFTC guidance on carbon credit derivatives, encourage us to enhance governance and build investor confidence. Our background in regulated markets informs our efforts, ensuring that the frameworks we advocate contribute to a transparent, efficient market that facilitates increased activity and broader participation in carbon credit trading, ultimately supporting climate action initiatives.

##### ii. What strategies are in place to ensure regulatory compliance across different jurisdictions?

At ZERO13, we implement a multi-layered strategy to ensure regulatory compliance across jurisdictions. Utilizing blockchain technology enhances data integrity and prevents manipulation in carbon credit trading. Integrating digital Measurement, Reporting, and Verification (dMRV) systems further promotes transparency. We vet projects rigorously, ensuring they meet ISO standards

and align with UN Sustainable Development Goals.

By connecting to various carbon registries, including established ones like Verra and innovative ones like CarbonCX, we maintain the integrity and diversity of our offerings. Our commitment to transparent pricing and community engagement fosters trust, while we continuously adapt to emerging trends and standards in the carbon market.

#### B. Fraud Prevention

##### i. Could you discuss the mechanisms ZERO13 has implemented to prevent fraud, particularly through blockchain verification processes?

At ZERO13, we utilize blockchain technology to create a transparent and reliable platform for carbon credit transactions. Blockchain ensures all transactions are permanently recorded, preventing issues like double counting and fraudulent credits. Our integration of digital Measurement, Reporting, and Verification (dMRV) systems allows for real-time monitoring of emissions reductions and transaction legitimacy. We implement stringent verification processes, listing only carbon credits verified by independent bodies that meet ISO standards and align with UN Sustainable Development Goals. Furthermore, we ensure compliance with leading global standards, including Verra, Gold Standard, and the American Carbon Registry. Through blockchain's immutable nature and our robust verification processes, we guarantee the provenance and integrity of carbon credits, fostering a trustworthy environment for transactions.

##### ii. How can emerging technologies like dMRV be used to ensure transparency and reduce fraud risks in carbon markets?

Emerging technologies like digital Measurement, Reporting, and Verification (dMRV) are vital for enhancing transparency and reducing fraud risks in carbon markets. Traditional markets often struggle with issues like double counting and greenwashing, which dMRV effectively addresses. By utilizing IoT sensors, satellite imagery, and AI-driven analysis, dMRV provides real-time, verifiable data throughout the lifecycle of a carbon credit. This data, when combined with blockchain technology, is stored immutably, creating a transparent, auditable trail that minimizes fraud potential and builds trust among market participants.



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At ZERO13, we continuously integrate various dMRV systems into our platform, leveraging them alongside blockchain to create a secure and transparent ecosystem, ultimately enhancing market integrity and attracting investment for climate action.

### 8. Partnerships and Collaborations

#### A. Strategic Partnerships

##### i. How has ZERO13 leveraged partnerships with banks, custodians, climate fintech firms, and governments to scale its operations and expand globally?

ZERO13 has strategically leveraged partnerships with banks, custodians, climate fintech firms, and governments to scale its operations and expand globally. Collaborating with banks allows us to meet the rising demand for sustainability in B2B marketplaces and integrate climate finance into traditional financial systems. Our focus on custodians, both fiat and digital, enhances secure management of carbon credits and efficient transaction processes through our "network of networks" model. Partnerships with climate fintech firms like Decarb.earth and CarbonCX enhance our platform's capabilities in carbon credit origination, distribution, trading, and settlement.

Moreover, our engagement with governments in the Global South, particularly in ASEAN, Africa, and Latin America, supports sustainable carbon market development and digitization of national registries. With over 100 partners, including AWS, IBM, and Tata Consultancy Services, we access a diverse array of technologies and networks, enabling us to scale

our platform and enhance our global reach effectively.

##### ii. What are the key factors that drive successful collaborations in climate fintech?

Successful collaborations in climate fintech hinge on several key factors, including a shared vision for sustainability, technology interoperability, and complementary expertise. Partners must align on a common goal of enhancing climate resilience and bridging the multi-trillion-dollar climate financing gap. At ZERO13, we prioritize partnerships grounded in mutual commitment to addressing global climate challenges. Leveraging our AI-enabled and blockchain-driven digital infrastructure, we work closely with financial institutions, project developers, and climate tech firms, ensuring that each collaboration harnesses unique strengths.

Additionally, technology integration is vital given the complexity of carbon markets. Our platform is designed for seamless connectivity with various systems, including blockchain networks and traditional financial infrastructures, enabling smooth collaboration and scalability across borders and sectors. These elements collectively enhance the effectiveness and impact of our climate fintech partnerships.

#### B. Inclusive Market Participation

##### i. What is the role of inclusivity in building a democratized carbon market, and how does ZERO13 ensure access for smaller project developers, particularly in emerging markets?

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Inclusivity is essential for building a democratized carbon market, ensuring that all participants, regardless of size or location, have equal opportunities to sell carbon credits and generate revenue. ZERO13 addresses this by fostering a broad ecosystem aligned with the UN Sustainable Development Goals (SDGs), particularly focusing on community development.

To support smaller project developers in emerging markets, we offer a decentralized and user-friendly digital infrastructure. By leveraging blockchain technology and integrating digital tools like digital Measurement, Reporting, and Verification (dMRV), we empower these developers to verify and tokenize their carbon credits in a cost-effective and scalable manner.

This inclusive approach not only facilitates access to the carbon market but also promotes collaboration across the climate value chain, creating a positive climate impact that resonates globally. Ultimately, inclusivity helps prevent market imbalances, ensuring that even smaller players can contribute to and benefit from the transition towards a circular economy.

**ii. Can you highlight any educational initiatives or partnerships that help develop capacity in carbon markets for underserved regions?**

Education and awareness are priorities for ZERO13 as we conduct roundtables in several

community well-being, improving health and nutrition as incomes rise, particularly benefiting women. For instance, female smallholder farmers gain greater business opportunities, and coastal seaweed farmers—often uneducated women—can escape exploitation through our transparent approach. Ultimately, these partnerships build capacity in underserved regions to address climate change effectively.

### 9. Future Vision & Industry Trends

#### A. Climate Finance Innovations

**i. What new financial products or instruments do you see emerging from the carbon and ESG markets in the next few years?**

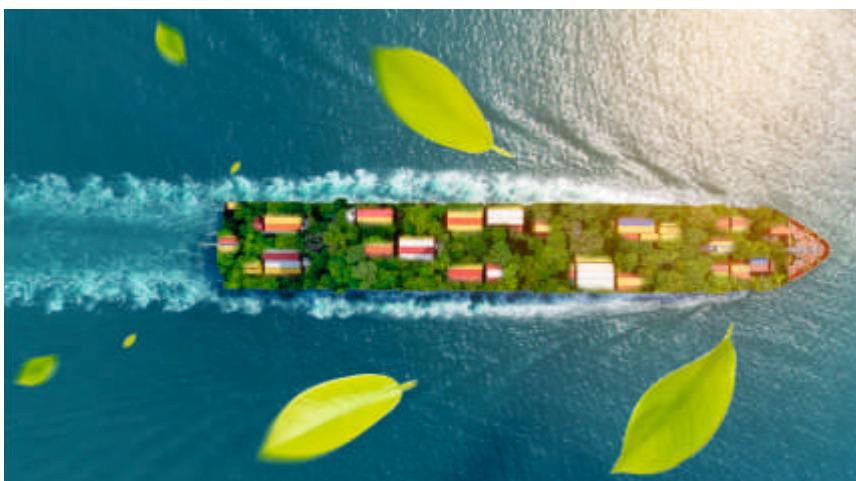
In the coming years, we anticipate the emergence of standardized carbon-related products, including structured products, ETFs, and futures based on effective indices. Additionally, innovative spot instruments like biodiversity credits, water credits, plastic credits, and hydrogen credits are likely to develop. We are excited about the potential growth and evolution of these markets as they continue to expand.

**ii. How does ZERO13 plan to continue leading the development of climate fintech, and what are the next big innovations on your horizon?**

ZERO13 plans to lead the development of climate fintech by focusing on innovative technologies that enhance transparency and efficiency in carbon markets. We will integrate blockchain with advanced digital Measurement, Reporting, and Verification (dMRV) systems to enable real-time tracking and verification of carbon credits, ensuring data integrity and reducing fraud.

We aim to develop new financial products, including biodiversity and plastic credits, expanding the scope of tradable environmental assets. By leveraging AI and machine learning, we will enhance predictive analytics, providing valuable insights for investors and project developers.

Our commitment to inclusivity drives us to partner with local stakeholders in emerging markets, ensuring smaller project developers have access to the necessary resources and technology. Through educational initiatives and capacity-building programs, we will empower



Global South countries, including Thailand, and partner with local universities. These initiatives align students with practical developments in carbon markets while fostering entrepreneurship through a sandbox environment.

In Africa, we collaborate with project developers focused on regenerative agriculture and efficient land use practices, such as agroforestry and land restoration. These efforts enhance

## STREAMLINING CARBON CREDIT TRADING FOR FAIR PRICING

communities, fostering a new generation of climate-conscious entrepreneurs. With these strategies, we are excited about shaping a sustainable climate finance ecosystem that contributes to global climate goals.

### B. Sustainability Goals

#### i. How does ZERO13 align with the United Nations Sustainable Development Goals (SDGs), particularly SDG 13 (Climate Action)?

ZERO13 aligns with UN SDG 13 (Climate Action) by facilitating climate finance and promoting high-integrity carbon credit projects. We connect project developers with investors, channeling capital into sustainable initiatives, particularly in developing nations like Kenya and Ghana. This helps these countries attract investment and enhance their GDPs through carbon credit exports. Additionally, our efforts support specific SDG 13 targets, including strengthening resilience to climate hazards and integrating climate action into national policies, reflecting our commitment to this crucial goal.



#### ii. What role does the platform play in mobilizing capital to close the multi-trillion-dollar climate financing gap?

ZERO13 addresses the multi-trillion-dollar climate financing gap by connecting investors with high-integrity carbon credit projects, especially in developing nations. Our "network of networks" model enhances trust and facilitates investment through transparent transactions and blockchain-secured records. By focusing on underserved regions, we enable capital flow towards impactful climate initiatives, promoting efficiency and equitable distribution of resources for sustainable development.





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**LEVEL OF DETAILED REPORTING IS ESSENTIAL FOR SAFEGUARDING THE LIVELIHOODS OF THE WORLD'S 500 MILLION SMALLHOLDER FARMERS, MOST OF WHOM LIVE IN THE GLOBAL SOUTH.**



**ERIN GROVER**  
Advisor T8 Capital

**1. Your Journey into Agri-Tech and Sustainability**

**Can you tell us how your career shifted from working with the UN and international NGOs to becoming a specialist in agri-tech venture capital focused on climate impact?**

Nearly 20 years ago, I found myself living in a farming community in a Himalayan hamlet just north of Kathmandu. Up close, I witnessed the grueling, backbreaking nature of the farmers' daily lives. Despite their challenges, these farmers showed me extraordinary kindness, sharing all they had and welcoming me as family. This heart-opening experience ignited in me a deep desire to use my position of privilege to give back and channel resources to them and other farming communities in need.

**2. Blockchain, AI, and IoT for Climate Impact**

**How do blockchain and AI technologies contribute to empowering smallholder farmers, particularly in the Global South, and building resilience against climate risks?**

Blockchain and AI together are transforming environmental data reporting, enabling secure, precise monitoring of farming plots, soil, air, and water distribution and quality. It doesn't matter where the farmers are located in the world, this level of insight will empower any farmer to make smarter, data-driven decisions that can lead to healthier crops and improved yields. High-quality data like this is also unlocking plot-specific farming insurance, providing an added layer of protection in the face of climate change.



## PROTECTING FARMERS WITH ESSENTIAL REPORTING

### 3. Water and Food Security

**Can you share specific examples of projects or partnerships that you've been involved in that successfully address water and food security through technology?**

I'm particularly excited about blockchain's potential to secure farmers' profits through smart contracts. One early pilot supporting smallholders through blockchain saw profits surge by 700-900% overnight. Ensuring fair pay for farmers is essential to addressing food security. Today, farmers worldwide—from the U.S. to India—are facing distressing rates of suicide, often due to hidden fees and profit cuts imposed by middlemen. Blockchain tackles this by locking in payments transparently across each stage of the supply chain, guaranteeing farmers receive their due without any loss to intermediaries.

### 4. Regenerative Agriculture and Supply Chain Transparency

**What is the importance of supply chain transparency for achieving sustainable agriculture and how does your work contribute to this goal?**

The integration of blockchain, satellite technology, and AI is now enabling precise, real-time data reporting to verify whether produce supply chains are regenerative or contributing to deforestation. These technologies are being deployed globally in response to the EU's deforestation regulation, which requires traceability for over 5,000 companies exporting products like coffee and cacao to Europe. Supply chains that fail to meet these traceability standards will face fines and, ultimately, rejection by EU customs in the future.

This level of detailed reporting is essential for safeguarding the livelihoods of the world's 500 million smallholder farmers, most of whom live in the Global South. I have advised several initiatives on how to integrate these technologies, including one in India that also helped increase farmer profits by 900%. I continue to advocate for these necessary technologies to protect farmers and support food security. However, the transition is not happening fast enough and will require significant time and resources. The clock is ticking.

### 5. Collaboration with Global Institutions and International Protocols

**As a member of the World Economic**

**Forum's Crypto Sustainability Coalition, how do you see blockchain and decentralized technologies contributing to global climate goals such as Net Zero?**

Through my work with the World Economic Forum's Crypto Sustainability Coalition, I have helped demonstrate how emerging technologies can combat fraud and restore credibility in the carbon industry, which has unfortunately been fragmented and untrustworthy for decades. These tools can also monitor soil carbon assets in



real time, offering buyers clear assurance that their investment is making a verified, positive environmental impact. With greenhouse gas emissions reaching all-time highs, this transparency is essential, especially as the voluntary carbon market has remained unregulated for too long. The industry's greatest challenge is the persistent uncertainty around the validity of carbon credits. These technologies can provide the proof needed to confirm that carbon reductions are real and impactful with 100% accuracy.

### 6. Sustainability and Climate Impact in Asia

**As climate-related challenges grow in Asia, particularly in regions highly dependent on agriculture, what is your outlook on the role of technology in supporting climate resilience and food security in this region?**

**What specific innovations or business models do you believe can accelerate the**



## PROTECTING FARMERS WITH ESSENTIAL REPORTING

**transition to regenerative agriculture and improved water management in Asian markets?**

In my 20s, I spent many years working with the United Nations and similar NGOs. Despite the good intentions, I observed that much of the work goes unchecked and often lacks proper validation. These organizations are not immune to human error and, at times, corruption, which makes me cautious about fully trusting UNSDG initiatives. During my time there, I witnessed both loss and misuse of funds, which reinforced the need for accountability in these sectors.

Whether it's UNSDG projects or emerging impact investment products, my focus is on preventing greenwashing. While UNSDG efforts make for compelling presentations and photo opportunities, these visuals alone cannot verify the authenticity of environmental impact. We need technology to validate that these assets and efforts are genuinely effective. Real accountability requires data-backed proof, not just good intentions and well designed marketing materials.

### 7. Impact on Smallholder Farmers

**You're a strong advocate for improving the livelihoods of smallholder farmers. Can**

**you share a few success stories where your work with blockchain, AI, or IoT has significantly improved the lives of farmers, especially in the Global South?**

**How do you involve farming communities in implementing these technologies, and how do you ensure that they benefit from these advancements?**

I believe the urgent call to action lies with governments stepping up to regulate carbon markets and produce supply chains. Effective regulation will enforce transparency and data accuracy, weeding out greenwashing and fraud. The challenge, however, is that this is a systemic issue that won't be resolved overnight—and time is not on our side. I urge government stakeholders, philanthropists, and impact investors to prioritize and accelerate these solutions. With 2030 fast approaching, it will likely take four to five years and a significant workforce to help the world's 500 million smallholder farmers transition to digital supply chain reporting. Unfortunately, the carbon industry has made limited progress in adopting essential technologies, highlighting the urgent need for action. It will not gain full credibility until it implements strict, industry-wide and global regulations to verify the authenticity of its tangible assets.





# What is an **LCA**

## What is an LCA?

As Green Building Design Shifts Toward Embracing Embodied Carbon, Life Cycle Analyses Become More Crucial Than Ever

Professionals in the California construction industry are scratching their heads to understand the state's new regulation around Life Cycle Assessment (LCA)s and embodied carbon. Effective July 1, 2024, California will be the first state in the U.S. to require the consideration of embodied carbon in order to comply with CALGreen, the Green Building Standards Code. The change will impact commercial projects exceeding 100,000 square feet and schools exceeding 50,000 square feet. These changes are the result of years-long efforts of academic education and global collaboration between AIA California, Rocky Mountain Institute, New Buildings Institute,

USGBC, and other movements around the world, including EU Taxonomy. This article aims to provide an in-depth exploration of LCAs and embodied carbon.

It appears that the world is beginning to recognize the consequences of our wasteful energy practices and carefree, consumerism-driven lifestyle on our environment. The global

discussion has now shifted to how to take responsibility for the environment we live in rather than simply being wasteful consumers. An **LCA is used to assess the environmental impact of a product, considering both its material composition and our utilization of it. We must consider the following question in order to evaluate this environmental impact: Where does the product start its life?**



## SHIFTING TO EMBODIED CARBON IN GREEN BUILDING

Source: Ai Inspire/Adobe Stock

In the past, there was a widespread view that as soon as we start using a product or building, we become responsible for its environmental effects. This led to the term "operational carbon," which refers to the CO<sub>2</sub> emissions stemming from the energy consumption needed to operate a building. It is now well acknowledged that the acquisition and processing of a resource or product entails several steps that contaminate the environment.

As a result, an LCA is carried out to take into account a material's whole life cycle, which includes all phases, from the extraction of raw materials to their disposal, such as manufacturing, transportation, installation, maintenance, and demolition. In the extensive and difficult estimate of environmental impact in the LCA methodology, two factors are considered. One divides the long road of the building life cycle into smaller segments, known as LCA stages, and the second considers several metrics for quantifying environmental consequences, known as environmental impact categories, which will be discussed further below.

In the context of buildings, an LCA involves assessing the environmental impacts associated with several stages such as constructing, operating, maintaining, and demolishing buildings. There are three different phases of the building life cycle that are considered for an LCA, denoted as A, B, and C, or "cradle-to-grave." The A stages focus on raw material extraction, transportation to manufacturing,

production processes, and site logistics. B stages highlight maintenance-related aspects, covering post-installation repair, replacement, and refurbishment. Finally, the C stages examine the end-of-life phase, assessing deconstruction, transportation to landfill, recycling, and/or reuse options for the product or system.

To assess and compare environmental impacts, an LCA evaluates seven impact categories across the item's life cycle. Among these, the Global Warming Potential (GWP) is particularly noteworthy – it measures what is known as "embodied carbon." This concept has gained momentum in discussions within the green building industry, as it considers the total carbon dioxide emissions related to an item. The remaining six impact categories encompass acidification, eutrophication, formation of tropospheric ozone, ozone depletion, and depletion of non-renewable energy. California's new regulations emphasize GWP, while platforms like LEED focus on making choices that lower GWP percentage without significantly affecting other categories.

Given that building operations (27%) and embodied carbon from buildings (13%) collectively contribute to about 40% of annual global CO<sub>2</sub> emissions, regulators and third-party platforms are increasingly prioritizing these areas.

Source: Kristin Hernandez and Sara Motamedi, Verdical Group





## Keeping (Net) Positive: Verdical Group's Commitment to Carbon Positivity

Verdical Group continues its annual commitment to reducing carbon emissions, accurately calculating its footprint, and purchasing offsets to sustain a net positive environmental status.

In 2021, Verdical Group achieved a significant milestone by offsetting its entire historical carbon footprint, reaching back to the company's founding in 2012, with an additional ten percent offset. This move positioned Verdical Group beyond net zero, establishing it as a carbon-positive company. This decision aligns with the organization's active memberships in Amazon's Climate Pledge, the B Corp Climate Collective, and its standing as a Benefit Corporation dedicated to social and environmental impact. As sustainability consultants, Verdical Group's team focuses daily on promoting carbon-neutral building projects and organizing sustainable events. Since 2021, Verdical Group has calculated its annual carbon footprint, implemented policies to minimize its environmental impact, and offset any remaining emissions.

In 2023, Verdical Group expanded its calculations to include employees' home offices alongside its corporate locations. With many employees working remotely, this new calculation more accurately represents the company's footprint. Verdical Group's team remains available to guide organizations through their carbon accounting processes, offering resources such as a recent white paper on the topic.

### Scope 1: Direct Emissions

Scope 1 emissions originate from sources owned or controlled by Verdical Group, specifically from on-site natural gas combustion at office locations. This year, Verdical Group included its new San Diego

office. Emissions were calculated based on the proportionate square footage occupied by Verdical Group employees within shared spaces. Since most team members work from home, the estimate reflects an average of one employee per office per day, accounting for occasional in-office meetings where several employees gather.

### Scope 2: Indirect Emissions from Electricity Consumption

Scope 2 emissions encompass indirect emissions from purchased electricity. Verdical Group included its San Diego office data, calculating impacts based on square footage. The Power Content Label for each office's local utility provider informed estimates regarding renewable energy use, fossil fuel combustion, and other sources, such as nuclear and hydroelectric power. For 2023, Verdical Group relied on the 2022 Power Content Label, as 2023 data was not yet available. A similar energy mix is anticipated for 2023.

### Scope 3: Other Indirect Emissions

Scope 3 emissions capture indirect emissions stemming from Verdical Group's activities but from sources outside the company's control. The primary contributors include waste, employee commuting, procurement, and, for the first time, home office emissions.

#### 1. Waste

Verdical Group's waste calculations are based on individual averages per employee for 2023. Although home office energy was included, office waste estimates were used to more accurately reflect waste produced during working hours.

# Keeping (Net) Positive

## KEEPING (NET) POSITIVE

### 2. Commuting

Even with a largely remote workforce, employee travel still contributed to Verdical Group's 2023 emissions. The impact was calculated using data from an employee survey detailing travel mileage and methods of transportation.

### 3. Procurement

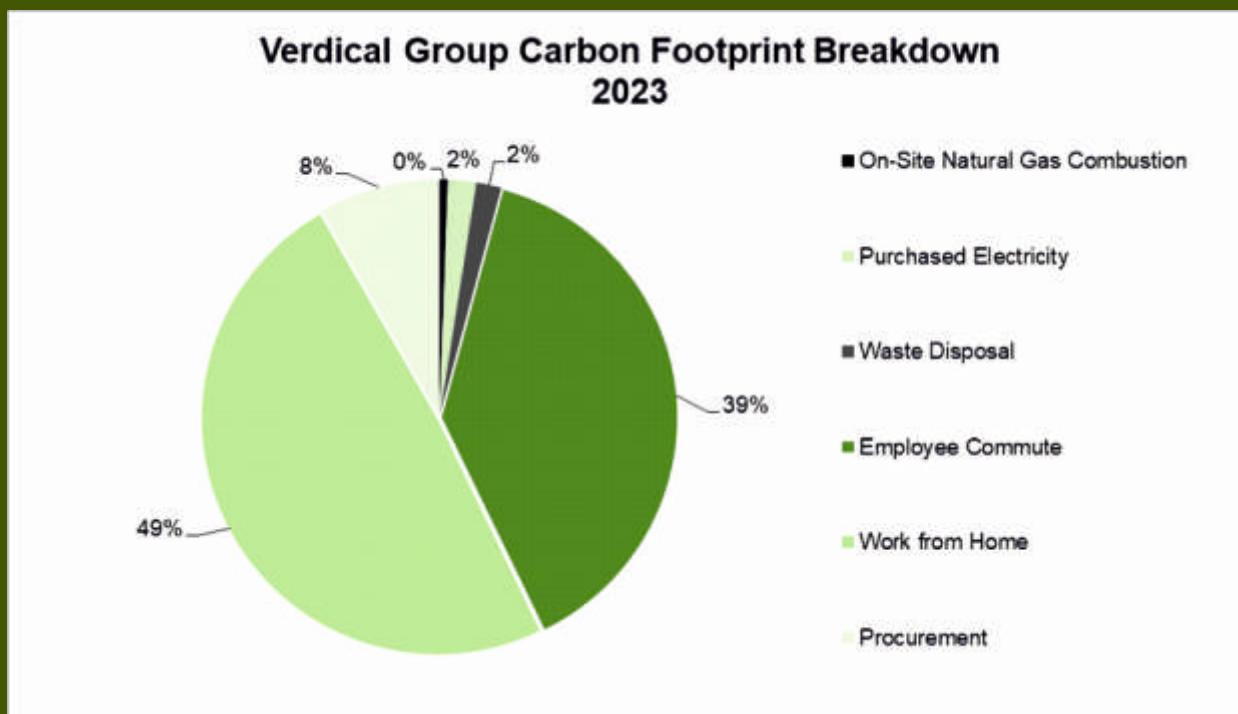
Procurement activities, such as online purchases, team meals, and electronics, contributed to Scope 3 emissions. When specific product emissions data was unavailable, Verdical Group selected similar items by material and weight to estimate impacts. Verdical Group's purchasing policies encourage green, third-party-certified products, green shipping options, and the return and recycling of branded items no longer needed by employees. The company recycles, composts, disposes of e-waste properly, and promotes reusing items to minimize waste.

### 4. Employee Home Offices

Home office emissions were included in Verdical Group's 2023 calculations. By sampling emissions for apartments and homes, Verdical Group estimated a daily work-related emissions figure for each type of housing. The team based calculations on eight hours out of each 24-hour day, assuming a continuous 365-day work presence, to avoid underestimating emissions for employees working beyond a typical work week.

### The 2023 Footprint Breakdown

Verdical Group's 2023 footprint breakdown showcases its comprehensive approach to carbon accounting and emissions reduction. Verdical Group invites those interested in learning more about organizational carbon accounting or looking to partner on sustainability initiatives to contact them at [hello@verdicalgroup.com](mailto:hello@verdicalgroup.com)



## eMarketing: A New Era for Farmers

**Pragati Gokhale, Founder of Marketmirchi.com and chief Mentor of Mission Marketmirchi, and National Resource Person for the Ministry of Rural Development, Government of India, explains the features of e-marketing for farmers and the lessons we've learned.**



**Pragati Gokhale**  
Founder, Marketmirchi.com

To provide a free online marketplace for farmers struggling to find proper market linkages, I developed Marketmirchi.com, an app that serves as a free, open social mission. This platform is helping numerous farmers, FPOs (Farmer Producer Organizations), and SHGs (Self-Help Groups) across the country to gain direct market linkages, primarily for B2B markets. IIT's Rural Tech Action Group, an initiative under the Principal Scientific Advisor to the Government of India, has adopted this as a project and is supporting Mission MarketMirchi.

The platform is user-friendly, available as both a website and an app, and is multilingual with a simple UI. There are three main sections: Sales, Buy, and

Jobs (the Jobs section is exclusively for the agriculture and allied sectors). Under Sales and Buy, there are 26 categories, including grains, pulses, dairy, agro-processing, agro-machinery, animal husbandry, and more. Recently, we added bamboo forestry, spices, cash crops, and biomass/biowaste to these categories. Whatever is marketed in rural India can be found on Marketmirchi.com.

MarketMirchi is an easy-to-use app. If you are a farmer, FPO, or SHG, you can click on the "Post-Free Self Ad" button, which will guide you to choose the appropriate category. After selecting the category, you can post your ad by selecting a sub-category, providing a heading, and adding details. If the price

## EMPOWERING FARMERS THROUGH E-MARKETING

is negotiable, you can enter 0 in the respective field. You can also choose the unit of measurement. If you're a new user, you can sign up by providing your name, address, mobile number (which will be used as your username), and a simple password. Once registered, your ad will be posted, and you will be directed to a list of buyers for your category, complete with call icons. Clicking the call icon reveals the buyer's contact number, allowing you to call them directly.

The more calls you make, the better your active ranking on the app, which increases your visibility to more buyers. Your ad receives higher priority based on the number of calls you make and your activity level on the app. We do not engage in commercial activities, and we ensure transparency by not hiding sellers' information from buyers. The more calls you make, the more prominently your profile will appear on the app's priority list for both buyers and sellers. Links to buyers' and sellers' lists are available on your homepage below the "Post Free Ad" button. You can access these links at any time to contact buyers and sellers. Fresh buyers and sellers are automatically added to these lists.

NITI Aayog has declared MarketMirchi as the best agriculture app. While it is spread across India, it has limited reach in southern India. As an IIT-backed project, MarketMirchi offers a wealth of training videos in all Indian languages. With the support of NABARD, NRLM, SRLM, and leading NGOs, we conduct hands-on training sessions for farmers, especially in remote areas. We have incorporated AI to help search for buyers for all agro-rural products, and we also have a budget for training B2B buyers. Many B2B buyers, such as Akshayapatra and Mumbai Grahak Panchayat, are using MarketMirchi to procure directly from farmers.

### How to Use Marketmirchi for Selling, and Buying Agro Rural Products?

On the homepage, under the "Sell" section, you will find the "Post Free Sales Ad" button and a link to call buyers. Once you post your ad, you will receive a contact list of buyers. You can post free advertisements to gain market linkages for all agro and rural products—completely free of charge. This platform allows you to post ads without any middlemen and conduct free direct agro and rural marketing both within India and internationally by contacting customers directly.

The entire process can be done on a smartphone by visiting the website or using the app available on the Play Store. Once the app is installed, you can select the language from the top right corner. You will see three main tabs on the homepage: Sell, Buy, and Jobs. When you click on "Sell," you will see the "Post Free Sales Ad" button. After clicking on it, you will be

presented with a list of categories to choose from. Select the appropriate category and post your ad for free.

After posting the ad, you will see the call list. You need to fill in all fields marked with an asterisk (\*). If your product is organic, you can mention that in the appropriate field. In the "Sales Details" field, you can describe the product, such as its type and quality. Enter the price in numbers without any words. If the price is negotiable, put "0" in the price field. You can select the unit of measurement in the next field.

At the end of the page, you will see two buttons—Old User Login and New Registration. If you are a new user, provide details such as your name, address, district, email, mobile number, and create a simple password. After clicking the "Post Ad" button, wait a few seconds, and you will receive a message saying you can directly call the interested buyers. Click on the call button in front of the buyer and click "I have understood." A new page will open with a list of all buyers who are interested in buying your product.



You can click the phone icon to contact the buyer directly.

The more calls you make, the more your market linkages will grow, and your ranking will improve. For each call, you will earn 2 points, which will help increase your ranking. When you click on the menu and select "Home," you will see a list of highly active ranked sellers at the top.

For buying, go to the Buy section from the menu, and click on "Post Free Buy Ad." Similar to the Sell page, you will see a list of categories. Select the category you are interested in, and a new page will appear. Fill in the fields one by one: select the subcategory, provide a heading, and enter the price as "0" in the price field. You can select the "Old User Login" option if you're already registered or use the new registration process. If you want your password to be remembered, click the "Remember Me" box at login. Once you click on "I have understood," a new page will show you a list of sellers in your selected category.

The more sellers you contact, the higher your active rank as a buyer will be. MarketMirchi does not ask for any kind of payment for priority listings. Your



## EMPOWERING FARMERS THROUGH E-MARKETING

priority will automatically increase based on your active rank, and you will gain more linkages by calling more buyers or sellers directly.

You cannot delete a posted ad yourself; only the technical team of MarketMirchi can do so. You can add a photo of the product by clicking on the "Choose File" button, selecting the picture from your phone, and clicking "Upload." The ad will now display with the product photo.

To post ads in the Job section, click on the menu, go to "Home," and click on Jobs. Jobs listed here are specifically for the agro and rural sectors. If you want to hire someone, go back to the menu and click on "My Ad Responses." You will see all responses for your posted ads under each section. You will receive an SMS and WhatsApp message with the interested customer's mobile numbers. You can also go to the menu, click on Help, and find instructions for effectively using the MarketMirchi app.

You can select your language and visit the MISSION MERA MOBILE MERA Marketing section from the menu, which explains the MarketMirchi mission. At the bottom of the page, there is a link to success stories. This app is currently available only for Android phones.

Using the same username (mobile number) and password created when posting the first ad, you can post sales, buy, and job ads multiple times and receive a call list of relevant buyers, sellers, or job providers.

**What are the key principles of eMarketing that farmers should understand to be successful?**

The first point is that farmers should be persistent. Secondly, they should not expect customers to line up immediately after posting an ad. They must understand that every market is not just a seller's market but also a buyer's market. Initially, farmers should start by calling the buyers to increase the ranking of their ad. As the ranking improves, buyers will start calling them.

Farmers or FPOs should understand that they need to take the initiative to contact buyers first and make them aware of the quantity available. Buyers can then purchase collectively, which will help farmers earn more profit. Buyers may need to visit the seller's place, as the price could be negotiable depending on logistics and other factors.

Farmers should understand that ours is a free platform offering both buyers' and sellers' contact lists, and they need to call and establish their market linkages. Market Mirchi is a cross-state, cross-district, and cross-border platform. When farmers find online buyers, they can negotiate with them and engage in trade to secure better prices. We have seen success in states like Jharkhand, Gujarat, Maharashtra,

Andhra Pradesh, and more.

**How has eMarketing impacted the agriculture industry and farmers' livelihoods?**

eMarketing has had a significant impact on the agriculture industry and farmers' livelihoods. Previously, farmers relied on traditional marketing channels like APMC (Agricultural Produce Market Committee) to get market linkages. However, not all products can be sold through APMC, and there is limited choice of buyers outside of this system. APMC primarily handles grains and pulses, leaving other agricultural products without a reliable marketplace.

This is where eMarketing comes into play. With most farmers now using smartphones, they can easily learn the techniques of eMarketing. Platforms like Market Mirchi assist farmers by teaching them how to post ads using their smartphones and gain market linkages without spending a single penny.

Additionally, when farmers transport their products to APMC, the expenses are often high. In contrast, they can utilize eMarketing platforms like Market Mirchi, which is completely free and can yield tangible results.

**What is the main challenge faced by farmers in adopting eMarketing strategies, and how can they be overcome?**

The main challenge faced by farmers in adopting eMarketing strategies is the taboo surrounding technology. However, through our training sessions, we help them download the app, MarketMirchi.com, post their ads, and access buyers' contact links. Capacity building is essential in this field for farmers and FPOs, and we are addressing this through collaborations with both government and non-government agencies.

**Which digital platforms have proven to be more effective for farmers in eMarketing, and how?**

Till date, no other platform has been identified that is completely free, with no subscription fees, and offers the ability to post ads and receive buyers' and sellers' contact lists for each category and subcategory. Market Mirchi is unique in this regard—it's absolutely free, delivers results within five minutes after posting an ad, and is easy for farmers, FPOs, or SHGs to use. This is why Niti Ayog has included it in the list of the best agricultural interventions.

**What role do data analytics and market research play in eMarketing for farmers?**

Data analytics plays a crucial role as we use it to connect with B2B buyers on this platform. We have developed different modules for data mining, and it is through AI that we can reach B2B buyers effectively.

**Can you share some success stories of farmers who have benefited from eMarketing**



## EMPOWERING FARMERS THROUGH E-MARKETING

practices?

A farmer from Rajasthan placed an ad on our app to sell desi cow dung, which helped him secure significant market linkages in Delhi and Mumbai, where there is high demand for desi cow dung for rituals. A group of women from the Mahila Kisan Sashaktikaran Pariyojana in Jharkhand posted an ad for sarson (mustard) on our app after receiving low prices at the APMC mandi. After training, they came together, negotiated, contacted buyers, and secured a better deal from Gujarat, with traders visiting their place to purchase at Rs. 6000 per ton, which was far higher than the local mandi price.

In Chhattisgarh, a farmer posted an ad for millet on our app when the price was Rs. 60 per kg. After contacting a buyer from a nearby district, the farmer was able to sell the millet for Rs. 70 per kg, making a profit. With proper training, farmers are empowered to trade effectively on their own.

In Osmanabad, a Self-Help Group (SHG) prepared vermicelli from millets and connected with Mumbai Grahak Panchayat through our app. Another success story comes from the Northeast, where a bamboo entrepreneur from Guwahati used our platform to gain B2B market linkages for the artefacts he developed, connecting with a buyer in Chennai.

All these success stories are recorded and available on the Market Mirchi YouTube channel. Recently, Akshay Patra, the largest Mid-Day Meal Program, also started procuring from farmers via Market Mirchi.

What are the future prospects and trends in eMarketing for farmers, and how they can stay ahead?

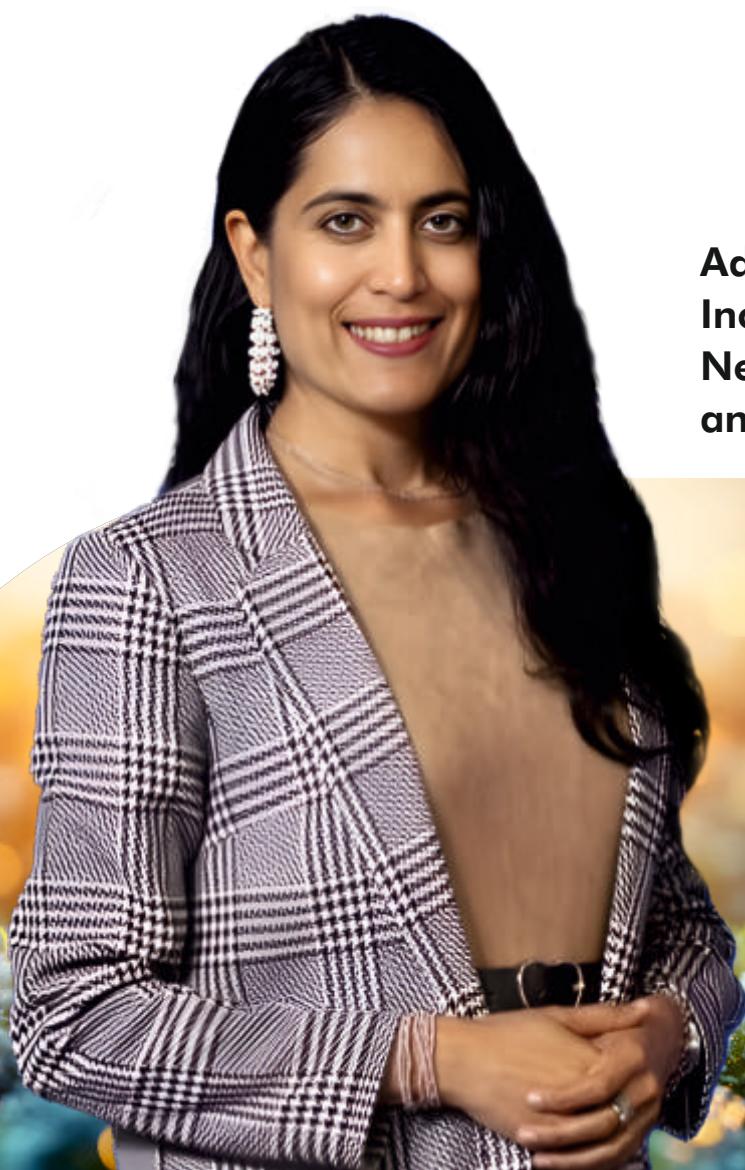
The future of farming will be dominated by eMarketing. With plans to abolish or modify the APMC model, local markets may no longer be

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Animal Husbandry Dairy  
Rural Products Rural Lands  
Agro Machinery Agro Processing  
HighTech Agri Irrigation



sufficient for farmers to access good prices. To reach markets across districts, states, and borders, farmers will need to embrace eMarketing techniques. Our app, MarketMirchi.com, along with our training initiative "Mission Mera Mobile Mera Marketing" for Rural India, can help farmers connect with better market linkages, allowing them to sell or buy goods more effectively.





## **Advancing Gender Equality, Financial Inclusion, and Climate Action: Neha Mehta on Empowering Women and Marginalized Groups in FinTech**



### **NEHA MEHTA**

Founder Femtech Partners

#### **1. Digital Financial Empowerment for Women in Developing Economies**

- a. How do you ensure that women in developing economies, like ASEAN and Oceania, can access and benefit from digital financial services?**

At FemTech Partners, we focus on simplifying digital financial services for women through digital literacy programs and tailored products. We partner with local organizations to address specific barriers such as lack of mobile access, trust, or formal education. By offering financial products that cater to women's needs—like micro-loans and savings accounts accessible via mobile phones—we empower women to make financial decisions independently.

- b. Can you share a success story where your initiatives helped significantly improve access to finance for women or marginalized groups?**

During the COVID-19 pandemic, we

collaborated with domestic workers in Singapore to transition them from offline cash transactions to online financial services. Many of these women were previously unbanked, relying on traditional remittance channels. Through our initiative, we introduced them to mobile banking and robo-advisory platforms, empowering them to make informed financial decisions.

Over time, several domestic workers began investing in robo-advisory services and even in cryptocurrency, which was a huge step toward financial independence. One standout case involved a worker who managed her savings so effectively that she eventually purchased a house in her home country. This project also ensured that remittances were more efficient, smoother, and at lower costs, helping these women send money back home safely during the pandemic. The sense of empowerment they felt was inspiring, and many have since become advocates for digital financial inclusion within their communities.



## DRIVING GENDER EQUALITY, INCLUSION, AND CLIMATE ACTION

### c. What role do you see FinTech playing in closing the gap for women in emerging markets, and how does FemTech Partners address this issue?

FinTech enables us to bypass traditional barriers by offering digital access to financial services. Mobile wallets, digital savings, and micro-lending can reach women in areas where physical banks are scarce. At FemTech Partners, we focus on user-friendly, low-cost digital platforms tailored to women's needs, ensuring they feel comfortable using these tools.

### 2. Climate Sustainability and the Blue Economy

#### a. What challenges do you see in implementing climate-focused financial solutions in developing nations, and how can FinTech accelerate progress?

The biggest challenges are infrastructure gaps and financial illiteracy. FinTech can bridge these gaps by providing accessible digital platforms that offer climate-friendly financial solutions, such as green bonds or micro-insurance for climate risks. We also need to educate users about these solutions, which is why financial literacy is integral to our programs.

#### b. How can financial inclusion and climate sustainability be integrated to support ocean-based economies in SIDS?

By leveraging digital financial services, we can support small businesses in ocean-based economies. For example, FinTech solutions like mobile savings accounts and micro-insurance help fishermen and small-scale marine businesses manage risks from climate change while also offering financial resilience.

#### c. How important is collaboration between businesses and governments, and what role does policy reform play?

Collaboration is crucial. Governments need to create an enabling environment through policy reforms, such as tax incentives for green projects and streamlined regulations for FinTech start-ups. Businesses, in turn, can offer innovative solutions that address both financial inclusion and climate resilience, driving change at the grassroots level.

#### d. How does FemTech Partners integrate environmental considerations into your financial inclusion strategies?

At FemTech Partners, we focus on promoting sustainable financial practices by integrating environmental awareness into our financial inclusion strategies. We collaborate with

financial institutions to create incentives for businesses adopting green practices. Additionally, our financial literacy programs educate individuals and small businesses about the importance of climate risks, sustainability, and how adopting eco-friendly operations can enhance their financial resilience. By empowering communities with the knowledge to make environmentally conscious financial decisions, we contribute to the broader goal of climate sustainability.

### e. What are the most promising opportunities in the blue economy that can support both financial inclusion and climate sustainability?

Marine-based micro-enterprises offer great potential. FinTech can support these ventures by providing microloans for sustainable aquaculture or fisheries, helping small businesses grow while promoting environmental sustainability. The development of ocean-based eco-tourism, supported by digital payment platforms, is another promising area.

### f. How does technology address climate challenges while promoting economic opportunities for women in developing economies?

Technology can democratize access to climate-resilient financial products, such as insurance against natural disasters or loans for eco-friendly businesses. By simplifying access to these services via mobile platforms, women in rural areas can benefit from the financial and environmental protection they provide.

### 3. Leveraging Emotional Intelligence in FinTech Leadership

#### a. How does emotional intelligence (EI) enhance leadership in the FinTech sector?

Emotional intelligence enables leaders to better understand and respond to the needs of both customers and employees. In FinTech, this can lead to more innovative solutions that genuinely address users' pain points, as well as a more inclusive, empathetic work environment that encourages creativity and collaboration.

#### b. Do you believe that emotional intelligence gives women a unique advantage in the FinTech space?

Absolutely. Women's traditionally higher emotional intelligence allows them to build more empathetic, inclusive products and teams. Encouraging women to leverage this trait helps foster innovation and develop solutions that



## DRIVING GENDER EQUALITY, INCLUSION, AND CLIMATE ACTION

- meet the diverse needs of the underserved.
- c. **What steps have you taken to create a supportive environment for women at FemTech Partners?**

We prioritize mentorship, open communication, and leadership opportunities for women. Emotional intelligence plays a key role in my leadership style; I focus on creating a culture of empathy and inclusivity where women feel supported to take risks and grow professionally.

4. **Innovating for Financial Inclusion and Sustainability**

- a. **What innovative strategies did FemTech Partners employ in projects like the Prosperity Fund and Bangladesh Outreach?**

In both the Prosperity Fund and Bangladesh Outreach projects, FemTech Partners focused on creating an enabling environment for financial inclusion through collaboration with regulators and key stakeholders. We worked closely with regulators to shape policies that promote financial inclusion, particularly for marginalized groups. In Bangladesh, we conducted in-depth research to understand the barriers women in rural areas face in accessing financial services. This led to exploring partnership with bKash, a leading mobile financial service provider, and other digital wallet platforms to expand financial access. By integrating digital finance solutions, such as mobile wallets and digital payments, we empowered women to access financial services conveniently and securely, ultimately improving their economic independence and participation in the digital economy.

- b. **How can large corporations work with FinTech innovators to drive financial inclusion and sustainability goals?**

Corporations can provide funding, mentorship, and market access for FinTech start-ups. Collaborations, like with BlackRock, allow us to scale financial inclusion initiatives by leveraging corporate resources and expertise while providing sustainable solutions to the underserved.

- c. **How do you see mobile money and e-KYC evolving to enhance financial inclusion?**

Mobile money and e-KYC are already transforming financial inclusion by reducing barriers to entry. As these technologies evolve, we'll see more seamless integration into local ecosystems, allowing even more people to access financial services, especially in remote and underserved areas.

5. **Driving Gender Diversity in FinTech**

- a. **What are the key barriers preventing women from entering the FinTech space, and how can FemTech Partners help overcome them?**

Key barriers include lack of access to education, mentorship, and funding. FemTech Partners addresses these by offering training programs, connecting women to mentors, and providing access to financial resources. We also work with stakeholders to advocate for more inclusive policies that support female entrepreneurs.

- b. **How has your collaboration with initiatives like The Female Factor and the FinTech Power 50 influenced the development of women leaders in FinTech?**

These initiatives have been instrumental in amplifying the voices of women in FinTech. By offering platforms for networking, mentorship, and recognition, they have helped to inspire the next generation of female leaders, and our collaboration has enabled us to reach a broader audience of aspiring women in the sector.

- c. **What advice would you give to young women looking to make their mark in FinTech and sustainability?**

Take risks, seek out mentorship, and don't be afraid to challenge the status quo. FinTech is evolving rapidly, and there's ample opportunity for women to make significant contributions—especially in areas like sustainability and financial inclusion.





## KATHERINE CHAN

Director, Business Development, The Hong Kong Research Institute of Textiles and Apparel (HKRITA)

### 1. General Overview

- a. What was the primary vision behind establishing Open Lab, and how does it seek to drive change within the textile and fashion industries?

Open Lab, a pioneering initiative by HKRITA and the H&M Foundation, aims to transform the fashion and textile industry in the fight against climate change through rapid innovation, impactful inspiration, and scalable collaboration. Our approach is threefold: showcasing sustainable solutions at scale, fostering a collaborative platform for industry-wide partnerships, and contributing to problem-solving and resource optimization, thereby driving the industry toward a sustainable future.

Open Lab serves as a central hub, connecting stakeholders across the supply chain with the shared goal of advancing toward a "planet-

positive" future. By promoting collaboration, we harness diverse expertise and resources to address the pressing challenges of climate change. We also plan to host activities such as site visits, collaborative trials, sharing sessions, workshops, and conferences to share our research findings and inspire further innovation.

### 2. Physical Infrastructure

- a. What are the advantages of having a dedicated R&D space like Open Lab for scaling up sustainable solutions in the fashion industry?

A dedicated R&D space like Open Lab offers significant advantages for advancing sustainable solutions in the fashion industry. The physical Open Lab houses both a Pilot Plant and a Fashion Future Lab, each designed to support innovation and scalability.



## TRANSFORM THE FASHION & TEXTILE INDUSTRY

Open Lab provides a critical platform for advancing scalable sustainable solutions in fashion. Its Pilot Plant is an industrial-scale upcycling line that enables real-world demonstrations and technology trials. With an AI-powered garment sorting system and the Green Machine 2.0, which recycles PET-cotton blends at a rate of 1 ton per day, the plant illustrates the feasibility and benefits of circular production, inspiring wider industry adoption.

The Fashion Future Lab supports early-stage innovations with a flexible, modular design, allowing for rapid, scalable development. Its “Farm-to-Garment” project, which includes hydroponic cotton cultivation and garment knitting, embodies sustainable, adaptable production.

By sharing these research outcomes, Open Lab promotes collective industry action on climate change. Through collaboration and innovation, it aims to reduce the industry's environmental impact and empower consumers to make more sustainable choices.

### 3. Alignment with Sustainable Development Goals (SDGs)

#### a. Could you share examples of projects or initiatives that directly align with these SDGs?

At Open Lab, several key technologies directly contribute to achieving Sustainable Development Goals (SDGs), including those related to water, innovation, responsible consumption, and production.

For instance, our AI-powered smart garment sorting system aids recycling efforts by categorizing used garments by type, structure, material, and colour, improving efficiency and material recovery. The Green Machine further supports circularity by decomposing cotton into cellulose powder and recovering separated polyester fibres for reuse, using water, heat, and minimal biodegradable chemicals.

We also have Acousweep, an acoustic wave technology that separates microplastic fibres during water treatment, reducing pollution. Additionally, our vertical hydroponic cultivation initiative grows extra-long-staple cotton while optimizing water, fertilizer, and space usage, directly supporting sustainable agriculture goals.

These projects underscore our commitment to sustainable innovation, enhancing responsible production practices that align with the SDGs.

### 4. Approach and Core Activities

#### a. Open Lab focuses on developing agile solutions to address climate change. Can you elaborate on the specific types of innovations you are currently showcasing?

At Open Lab, we are showcasing several cutting-edge technologies designed to address climate change within the fashion and textile industry. Our AI-powered smart garment sorting system enhances recycling by efficiently sorting used garments by type, structure, material, and color, streamlining the recycling process.

The Green Machine decomposes cotton into cellulose powder and recovers separated polyester fibers for reuse, utilizing water, heat, and less than 15% biodegradable chemicals—demonstrating a sustainable method for textile recycling. We also use Acousweep, which employs acoustic waves to separate microplastic fibers during water treatment, helping to reduce water pollution.

Additionally, our vertical hydroponic cultivation system enables the growth of extra-long staple cotton with optimized use of water, fertilizer, and space, supporting sustainable agriculture and reducing resource consumption. These innovations exemplify our commitment to scalable, sustainable solutions for climate resilience.

#### b. How do you engage different stakeholders across the industry's value chain to foster collaboration and problem-solving?

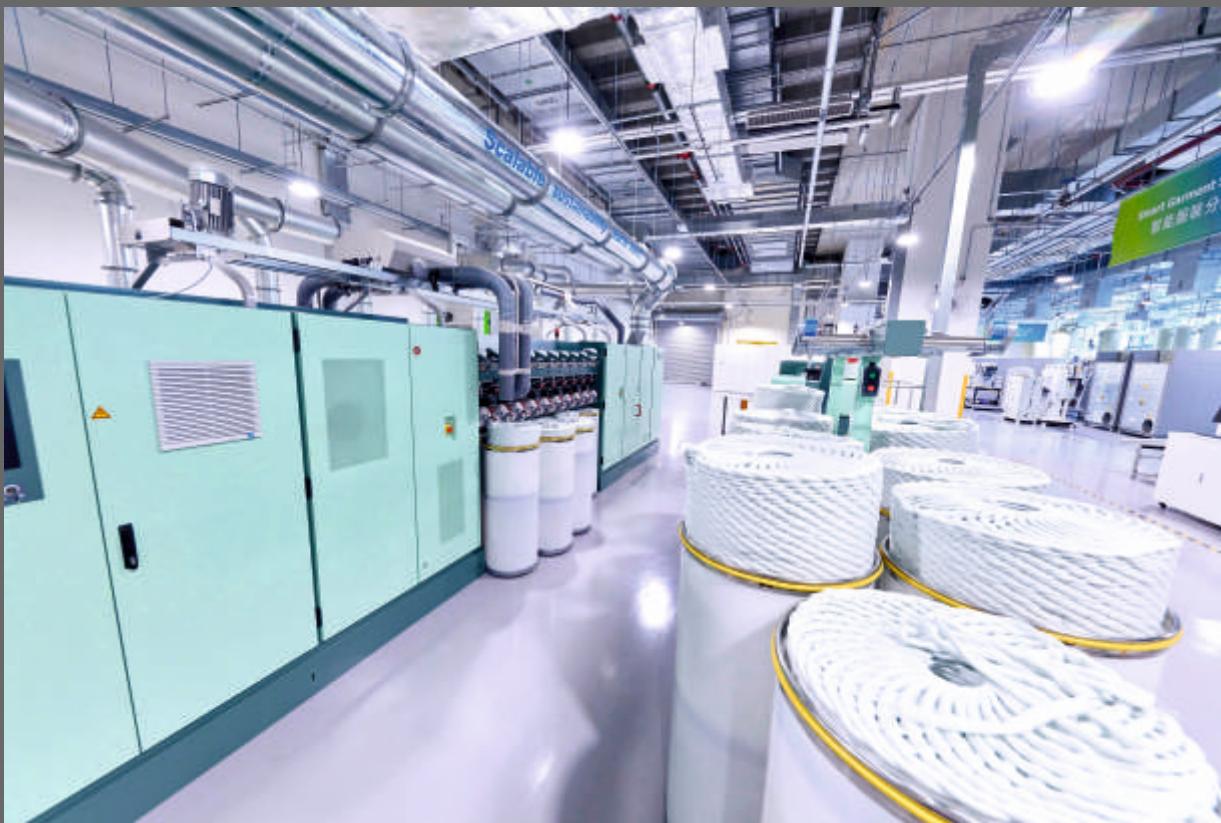
To engage stakeholders across the industry, Open Lab employs several approaches. We organize regular visits, allowing stakeholders to see our innovative technologies and industry trials firsthand. We also collaborate with interested parties to conduct practical trials, demonstrating the real-world viability of our technologies.

Additionally, we hold sharing sessions, workshops, and conferences to disseminate research findings, creating a platform where talent can grow and industry experts can learn from one another. Our online presence—including our website, social media channels, and e-newsletters—further supports continuous communication and engagement.

For example, Open Lab has collaborated with ISS (facility services provider) and Redress (an environmental NGO). These organizations have contributed used uniforms and worn-out fashion items for recycling trials, which are currently in their initial stages. Through these partnerships, we're fostering a collaborative environment that drives meaningful progress in sustainability.



## TRANSFORM THE FASHION & TEXTILE INDUSTRY



### 5. Technological and Research Infrastructure

- a. What types of technologies or research methodologies do you use to address resource optimization and environmental challenges in fashion production?

To tackle resource optimization and environmental challenges, we utilize a range of advanced technologies and research methodologies. Open Lab showcases over 80 sustainable projects developed by HKRITA, each designed to reduce resource consumption and environmental impact. These technologies, detailed on our website, include options for licensing by industry players, facilitating widespread adoption of sustainable practices.

For technologies still in the early stages, we co-develop with industry partners to scale them effectively. To assess impact, we conduct life cycle assessments on select projects, focusing on business viability, environmental sustainability, and social equity. By organizing events and outreach, we actively engage the industry, encouraging sustainable innovation in fashion production.

### 6. Physical Lab Facilities: Pilot Plant and Fashion Future Lab

- a. How does the Pilot Plant's industrial-scale demonstration inspire and encourage the adoption of circular practices within the broader industry?

The Pilot Plant demonstrates the feasibility of circular production through its advanced, industrial-scale recycling processes. At the heart of this facility is an AI-powered smart garment sorting system, which uses image analysis to sort used garments by type, structure, material, and colour with 90% accuracy. By automating sorting, it addresses a major bottleneck in the recycling business, speeding up processing and increasing efficiency.

Additionally, the Pilot Plant's Green Machine treats cotton-polyester blends—a common textile material—by decomposing cotton into cellulose powder while separating polyester fibers. These fibres can then be re-spun into new yarn, and the cellulose powder can be converted into regenerated fibres or superabsorbent polymers for agriculture, forming a circular production system.

This setup not only demonstrates the practicality and benefits of circular processes but also serves as an inspiration for other industry players to adopt similar practices, ultimately fostering a more sustainable approach to textile production.

### 7. AI-Powered Smart Garment Sorting System

- a. What potential do you see for scaling this technology in other parts of the fashion and textile industry?

## TRANSFORM THE FASHION & TEXTILE INDUSTRY

Open Lab's technology shows strong potential for scaling across the industry, particularly in handling post-consumer garments with diverse materials, construction, and colors. The AI-powered Smart Garment Sorting System can sort these varied materials to identify those suitable for further processing by the Green Machine.

The system's flexible design allows it to be customized for specific business needs. It can operate as stand-alone units or be configured in various arrangements to handle specialized sorting tasks and operations. This adaptability enables the technology to be scaled across different industry segments, facilitating the widespread adoption of circular practices and contributing to a more sustainable future for fashion and textiles.

### 8. Green Machine 2.0

- a. Could you share insights into how this technology is being received by industry partners, and its potential to revolutionize textile recycling?

The technology has garnered a positive reception from industry leaders, highlighting its

potential to revolutionize textile recycling. By selectively decomposing cotton into cellulose powder and separating polyester fibres through a process using water, heat, and minimal biodegradable chemicals, it offers an efficient, eco-friendly solution for recycling blended fabrics.

This technology has already been licensed by notable industry players like ISKO, a leading denim producer, and Looptworks, a U.S.-based textile recycler. Such partnerships underscore the confidence in its scalability and impact, paving the way for a more sustainable and circular textile industry.



### 9. Fashion Future Lab

- a. How do you foresee this space evolving to meet future sustainability challenges in fashion?

The modular design of Open Lab enables quick adjustments and responsiveness, making it well-suited to address evolving sustainability challenges in fashion. With this adaptability, Open Lab can pivot to meet shifting market demands and incorporate emerging technologies seamlessly.



## TRANSFORM THE FASHION & TEXTILE INDUSTRY



Since its official launch in September, Open Lab's Fashion Future Lab has already initiated the Farm-to-Garment project, a location-independent production line that spans hydroponic cotton cultivation to yarn processing and garment knitting. This project exemplifies how Open Lab is pioneering adaptable, sustainable production models, laying a foundation to tackle future challenges in resource use, waste reduction, and circularity within the fashion industry.

### 10. Farm-to-Garment Project

- a. How does vertical hydroponic farming in this context contribute to reducing the environmental footprint of cotton cultivation?

The Farm-to-Garment project leverages vertical hydroponic farming to make cotton cultivation more sustainable. In a soilless, stacked system, plants are grown in controlled environments

where nutrients are delivered directly to the roots through water, significantly reducing water consumption and minimizing fertilizer use.

This innovative model enables a streamlined supply chain, where cotton can be grown, harvested, processed into yarn, and knitted into garments in a single location. Being location-independent, this approach minimizes transportation needs, lowering the carbon footprint associated with moving raw materials.

The vertical farming system's modular design allows it to scale flexibly based on demand, from small-batch production to industrial-scale manufacturing. It also enables urban and localized production, reducing reliance on rural agricultural land and bringing textile production closer to consumers. This all-in-one approach not only conserves resources but also cuts emissions, supporting a more sustainable future in fashion.





**Ankita Patwa**  
CEO & Founder

### The EV Revolution's Green Dilemma: How TheGreenSolve is Restoring Consumer Trust

The electric vehicle (EV) industry has become a cornerstone of the fight against climate change, with U.S. EV sales rising by 45% in 2023 alone. Yet, behind the promise of cleaner transportation lies a growing problem: greenwashing. Companies exaggerating or falsifying sustainability claims risk eroding public confidence and undermining real environmental progress.

Enter **TheGreenSolve (TGS)**, a climate-tech startup transforming how businesses approach sustainability. TheGreenSolve isn't just a name—it's the green solution the EV industry needs to turn promises into progress and aspirations into action.

### The High Cost of Greenwashing

Greenwashing has already left a lasting mark on the automotive industry. Companies have faced public backlash and costly fines for misleading claims:

- Volkswagen paid \$550 million in 2020 for marketing its diesel vehicles as "clean" while

using software to cheat emissions tests.

- Hyundai and Kia were fined \$100 million by the EPA in 2014 for inflating their fuel efficiency ratings, misleading eco-conscious buyers.
- Even Tesla, a leader in the EV market, faced reputational damage in 2023 when discrepancies in its supply chain's environmental data surfaced.

For consumers, these incidents create confusion and distrust, making it harder to identify which companies are genuinely committed to sustainability. Businesses face even greater stakes, as regulatory penalties and a loss of credibility can derail their green ambitions.

### A New Era of Accountability

The push for corporate accountability has intensified. The Inflation Reduction Act of 2022 ties federal incentives for green initiatives to stringent reporting standards. Companies must now provide detailed data to back up their sustainability claims, ensuring they reflect real progress, not just clever marketing.

This shift aligns with public sentiment. Surveys show that 86% of Americans expect companies to disclose

their environmental impact, while 80% are more likely to support businesses with a proven commitment to sustainability.

Beyond regulation, the green economy is gaining momentum. Climate change policies, consumer demand, and market trends are reshaping industries, and EV manufacturers are at the forefront. To thrive, they need tools that ensure transparency and build trust.

### **TheGreenSolve: Pioneering Transparency in Sustainability**

At the heart of this movement is TheGreenSolve (TGS), led by environmental expert Ankita Patwa. With years of experience in sustainability projects and regulatory compliance, Patwa has positioned TGS as a trusted partner for businesses looking to navigate the complexities of sustainability reporting.

TGS offers practical, data-driven solutions tailored to the unique challenges of EV manufacturing. Its services include:

- Comprehensive Carbon Accounting: TGS helps businesses measure direct emissions, energy use, and supply chain impacts, offering clear insights into their environmental footprint.
- Tailored Sustainability Dashboards: These easy-to-use tools provide real-time data, empowering businesses to track progress and refine their strategies.
- Verified Carbon Offset Reports: By validating claims with rigorous data analysis, TGS ensures that businesses meet regulatory requirements and build consumer trust.

### **Restoring Consumer Trust and Driving Real Change**

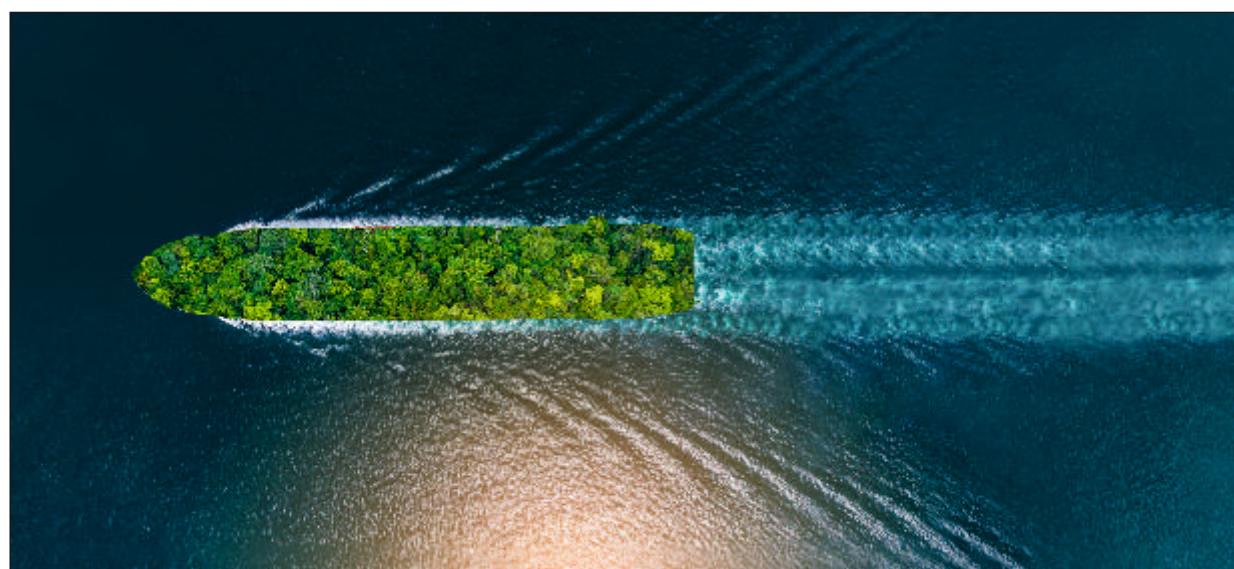


TheGreenSolve's mission goes beyond compliance. It's about helping companies turn sustainability into a competitive advantage and restoring consumer confidence. For consumers, this means knowing their choices align with their values. For businesses, it's an opportunity to lead with integrity in an increasingly eco-conscious world.

As the EV industry accelerates, the stakes couldn't be higher. Greenwashing must give way to verified action, and trust must be earned through transparency. **With TheGreenSolve's innovative tools and data-driven approach, the EV industry can deliver on its promise of a cleaner, greener future.**

By turning aspirations into measurable outcomes, TheGreenSolve is paving the way for a new standard in sustainability—one rooted in accountability and progress. Together, we can ensure the EV revolution drives real change for the planet and its people.

"With transparency and accountability, The Green Solve is helping EV manufacturers earn the trust of consumers and pave the way for a cleaner, greener future."



### 2024 in Review: UNEP FI and its members continue to drive change in challenging times

As we close the chapter on 2024, the imperative for the financial sector to spearhead the transition to a more inclusive, resilient, and low-carbon economy has never been clearer. The persistent impacts of climate change, nature loss and pollution and widening social and economic inequalities continue to highlight the urgent need for decisive action and to plug the gap in financing for sustainable development. This year, UNEP FI and its members have risen to these challenges with an impressive array of initiatives, producing 80 research and guidance papers and driving high-level engagement through tools and forums such as the revamped Human Rights Tool and the Forum for Insurance Transition to Net Zero (FIT). Our membership has expanded significantly, now encompassing 553 banks and insurers collectively representing over \$125 trillion in assets.

Major highlights of the year included UNEP FI celebrating milestone anniversaries for two of its key initiatives. The Principles for Responsible Banking (PRB) marked its fifth anniversary, now including over 350 members dedicated to aligning their practices with the UN Sustainable Development Goals and the Paris Climate Agreement. This framework has grown significantly, demonstrating the banking sector's commitment to sustainable finance. Meanwhile, the Net-Zero Asset Owner Alliance (NZAOA) marked its fifth anniversary at New York Climate Week in September.

On the insurance front, in addition to the Principles for Sustainable Insurance (PSI), UNEP FI introduced the Forum for Insurance Transition to Net Zero (FIT) in April, to advance net-zero insurance thinking and practices. FIT serves as a structured dialogue and multistakeholder platform, facilitating voluntary climate action among the insurance industry and key stakeholders.

COP16 and COP 29 further underscored the finance sector's vital role in translating biodiversity and climate change commitments into tangible outcomes. UNEP FI was instrumental in this effort, releasing a series of publications that provide actionable guidance for financial institutions to support the goals of the Kunming-Montreal Global Biodiversity Framework.

On December 16, UNEP FI's annual Leadership Council, chaired by Executive Director of UN Environment Programme, Inger Andersen took place. The meeting brought together CEOs and Chairpersons of banks and insurers – all members of UNEP FI – to provide vision and strategic direction to UNEP FI in orienting its role and that of the UN, in shaping, mainstreaming and deepening

sustainability integration across the industry. Throughout 2024, UNEP FI and its members have demonstrated a strong commitment to addressing global challenges and advancing sustainable finance, laying the groundwork for a more resilient and inclusive future.



### Advancing Global Biodiversity and Climate Goals

UNEP FI unveiled several new initiatives in 2024 to drive the insurance industry's transition towards sustainability and resilience in the face of climate change. The Forum for Insurance Transition to Net Zero (FIT) created specific guidance for insurance transition plans. In May 2024, UNEP FI launched a PSI Nature-Positive Insurance Working Group consisting of over 40 insurance market participants from around the globe. The working group will act as a platform for advancing progress on embedding nature into the insurance value chain through knowledge sharing and capacity building. To expand its capacity, the V20-Sustainable Insurance Facility (V20-SIF) formed partnerships with third-party organisations that share similar goals and have operations in V20 regions. These partners include the Global Shield Against Climate Change and the Access to Insurance Initiative.

At the end of October, the "People's COP," COP16 took over Cali, Colombia, bringing together more than 700,000 participants through the green zone. The conference served as a crucial checkpoint for assessing progress towards the 23 global biodiversity targets and four goals set at COP15. UNEP FI and its partners facilitated over 90 events in the green and blue zones. These included the first Finance and Biodiversity pavilion focused on aligning financial flows with national biodiversity strategies and action plans (NBSAPs).

A significant milestone was achieved by UNEP FI member Banco Davivienda, which, in partnership with the International Finance Corporation (IFC), launched a USD 50 million biodiversity bond aimed at protecting and restoring Colombia's biodiversity. UNEP FI also launched several key publications, including the Principles for Responsible Banking Sector Action Guidance for Nature, Nature in the Boardroom, From Kunming-Montreal to Cali, and the Finance for Nature Positive Discussion Paper. These resources are designed to help financial institutions integrate biodiversity considerations into their decision-making processes, supporting the goals of the Kunming-Montreal Global Biodiversity Framework, and look at how the financial system has responded to these.

At COP29, UNEP FI demonstrated its leadership in mobilising the financial sector to address urgent



climate challenges, showcasing the critical role of finance in achieving the goals of the Paris Agreement. UNEP FI played a leading role in the launch of transformative initiatives aimed at driving action from public, as well as private finance. UNEP FI and partners brought together expertise from thousands of financial practitioners worldwide into a consolidated set of recommendations for the New Collective Quantified Goal (NCQG) which emphasises leveraging public finance to catalyse private investment, particularly in developing economies. Additionally, UNEP FI spearheaded the launch of the Net-Zero Export Credit Agencies Alliance (NZECA) Target-Setting Protocol. This tool offers export credit agencies and export-import banks a practical roadmap to align their portfolios with net-zero goals, further embedding climate action within trade finance systems.

The Net-Zero Banking Alliance (NZBA) has continued to grow in membership since its launch in April 2021, now reaching 145 banks from over 40 countries. The 2024 NZBA Progress Report reveals that four in five banks are on target with all their target-setting commitments, with almost all having set their first round of targets and two-thirds on track with their transition planning. In March 2024, member banks updated their climate commitments by adopting a new version of the Guidelines for Climate Target Setting for Banks, extending the scope of targets to include banks' capital markets activities.

In May, the Net-Zero Asset Owner Alliance (NZAOA) updated its Governmental Carbon Pricing Position, integrating the latest data on the global effectiveness and coverage of carbon mechanisms. The updated data serves to solidify the Alliance's call for policymakers to follow through on their Paris Agreement commitments and integrate carbon pricing into their climate policy toolkits. Following the fifth anniversary of NZAOA, its 2024 Progress Report was released, highlighting significant advancements in 1.5°C-aligned decarbonisation. In August, the Alliance published its fourth and most comprehensive Target Setting Protocol, which includes updated membership requirements and detailed guidance on sovereign debt assessment.

UNEP FI's flagship biennial event, the 18th Global Roundtable (GRT), took place in December in Geneva, Switzerland, and online. The event brought together a diverse group of stakeholders, more than 500 banks, insurers, investors, regulators, policymakers, and civil society joined in person, to collaborate on shaping the future sustainable finance agenda. A further 1,600 watched a live feed of the conference. The event's success underscores UNEP FI's pivotal role in catalyzing action across the finance industry to foster more sustainable global economies.

During the roundtable, the Principles for Responsible Banking launched the Advancing Gender Equality and Women's Empowerment: Target Setting Guidance for Banks and Navigating Nature-related Regulations for Banks: Mapping the Policy Landscape, a first of its kind report providing an overview for banks to understand the latest regulatory developments on nature-related issues, and for government policymakers to consider ways to promote coherent and effective nature-related policies for the banking sector.

### Promoting Circular Economies and Pollution Reduction

In April 2024, 160 financial institutions, and as of November 2024, 180 institutions representing USD 17.2 trillion in assets, called on governments to negotiate a treaty to end plastic pollution. The Finance Statement on Plastic Pollution, prepared by UNEP FI with partners such as the Principles for Responsible Investment and CDP, calls for binding rules to address the full plastic lifecycle, scientific basis for policies, and harmonised targets across the plastics value chain. This statement emphasises the link between plastic pollution and climate change, biodiversity loss, and pollution, highlighting the need for systemic solutions.

UNEP FI also launched resources to help banks integrate circular economy principles into climate transition plans. Additionally, UNEP FI partnered with the European Energy Efficiency Financing Coalition to scale up energy efficiency financing in the EU, aligning with the activities of UNEP FI's members, including PRB signatories and members of the Net-Zero Banking and Net-Zero Asset Owner Alliances.

On 16 December, UNEP FI released its updated pollution report: Navigating Pollution: A Blueprint for the Banking Sector. This paper serves as a primer for banks navigating the landscape of pollution-related challenges and opportunities. It highlights the economic and societal costs of pollution, emphasizing the concept of double materiality – how pollution impacts both society and the environment, as well as poses financial risks to companies and financial institutions.

### Strengthening Financial Resilience and Innovation

The Principles for Responsible Banking (PRB) surpassed 350 members in 2024, now representing 54% of global banking assets, and marked its fifth anniversary in September. In October, the PRB launched the Responsible Banking Blueprint, prioritizing human rights, climate, nature, and

healthy, inclusive economies, new guidance to inspire banks in their transition to sustainability, signaling where a leading bank could be by 2030 and beyond. The PRB Responsible Banking Blueprint was outlined in an in-depth opinion piece published in Environmental Finance by Eric Usher, Head of UNEP FI. The editorial was a pivotal call to action for banks to operationalise sustainability into their frameworks.

In September, the PRB also released the reports Guidance on Effective Governance and Guidance on Client Engagement.

As a pioneer in impact management, UNEP FI remains committed to guiding its members and the broader financial community in navigating this evolving terrain. Impact management has been integral to the PRB with over 50% of banks globally actively conducting impact analysis guided by UNEP FI's holistic methodology.

In January 2024, UNEP FI updated the Portfolio Impact Analysis Tool for Banks, enhancing its functionality with a modular format that allows greater flexibility for different types of banks. It enables banks to assess their impact across sectors and guide strategic decision-making to set targets and better manage risks while enhancing their sustainability practices. The tool ensures that banks can measure, manage, and improve the environmental and social outcomes of their portfolios, contributing directly to their commitments under the PRB.

In November 2024, UNEP FI presented the revamped Human Rights Toolkit at the 13th United Nations Forum on Business and Human Rights in Geneva, Switzerland. This tool provides practical guidance for banks on developing human rights policies, undertaking due diligence, and creating effective operational grievance mechanisms. The tool will officially launch to UNEP FI members and the public in January 2025, furthering UNEP FI's commitment to integrating human rights considerations into financial decision-making.

### Highlighting Policy Action from Around the Globe

This year saw a surge in global policy and regulatory reforms, with countries advancing net-zero and sustainable finance frameworks. UNEP FI launched a new implementation support programme via a webinar series, to help financial sector actors prepare for and meet the requirements of the EU's Corporate Sustainability Reporting Directive (CSRD) and the corresponding European Sustainability Reporting Standards (ESRS). UNEP FI also contributed to the development of sustainable finance taxonomies in Brazil, Panama, and Costa Rica,

which are aligned with the Common Framework for Sustainable Finance Taxonomies for Latin America and the Caribbean (July 2023). UNEP FI partnered with the Climate Bonds Initiative and the Principles for Responsible Investment (PRI) to support global interoperability and implementation of sustainable finance taxonomies and other frameworks.

In 2025, further implementation of sector-specific policies, the rollout of emerging economy taxonomies, and greater harmonization across reporting and sustainable finance tools are expected. There will also be a focus on strengthening climate-alignment regulations and integrating nature and biodiversity risks into corporate and prudential frameworks, as well as further engaging members through a new PRB policy track.



### Trend Report Nature Finance: Looking ahead to 2025

#### Momentum is Building, but More Needs to Be Done: Accelerating the Transition

As the global conversation around nature finance evolves, the focus is shifting from "how"—measuring, disclosing, and reporting on nature-related metrics—to "what" is needed to align economies with the ambitious goals of the Global Biodiversity Framework (GBF). Leading financial institutions (FIs) are now grappling with how to transform operations and investments to drive a nature-positive future. While momentum is building, much more remains to be done in this critical moment.

#### A Systemic Transition for Nature Finance

Addressing nature loss requires more than metrics and disclosure—it demands systemic transformation of how economies operate. Financial systems must align with urgent environmental goals, including protecting 30% of the planet by 2030 (the 30x30 target). This transition requires prioritizing natural capital, developing innovative financial mechanisms, and ensuring investments reach critical biodiversity areas. Despite growing attention, there is a lack of effective financial vehicles to channel capital where it will have the greatest impact. The Protected Planet 2024 report highlights gaps in the 30x30 commitment, with only 17.6% of land, 11% of freshwater, and 8.4% of marine areas currently protected. Freshwater ecosystems, in particular, are experiencing steep declines. Financial institutions must urgently develop products targeting these areas. UNEP FI's Finance for Nature Positive Discussion Paper identifies nature mainstreaming and transition finance as critical contributions toward a nature-positive future, surpassing investments in restoration and conservation in scale and impact.



## Shifting Focus: From Long-Term Uncertainty to Immediate Risks

Nature-related risks have traditionally been viewed as uncertain, long-term threats. However, the focus is shifting to immediate, tangible risks, particularly physical risks linked to environmental degradation. Despite the urgency, nature remains undervalued in modern economic systems because it is not officially recognized as an economic asset. Incorporating nature-related risks into financial assessments is essential for embedding natural capital into mainstream economies. Without this integration, economies remain vulnerable to nature-related shocks, which could significantly undermine global GDP.

## Stress Testing Nature Risks: A New Era in Financial Risk Management

Central banks and financial institutions are increasingly spotlighting nature stress testing and assessing the economic impacts of nature loss on their portfolios. Research by the GreenFinance Initiative estimates that nature-related risks could result in a 12% loss to the UK's GDP, with potentially greater impacts in biodiversity-rich countries. Next to the macro-level impacts, the analysis estimated that some banks could see reductions in the value of up to 4-5% in some cases. Noting that these estimates are likely to be conservative, this indicates that nature-related risks will not just impact the economy, but potentially financial resilience. These findings underline the urgency of integrating nature into financial risk management and the growing importance of stress testing for nature-related financial stability.

Financial institutions must move from theoretical to practical action by incorporating nature stress testing into their core operations and engaging in finance for nature-positive — an area where new methodologies and frameworks, such as the Taskforce on Nature-related Financial Disclosures (TNFD) and the work of the NGFS on nature scenarios, are playing an essential role.

## Empowering Indigenous Communities

Indigenous peoples and local communities play a pivotal role in biodiversity conservation, recognized by the creation of a new permanent subsidiary body under the UN CBD. As stewards of the world's most biodiverse regions, their involvement is fundamental to any nature finance strategy.

Financial institutions must engage meaningfully with these communities, ensuring their expertise is acknowledged and they benefit from mobilized finance. Inclusion is not optional; it is essential for

legitimacy and the long-term success of nature finance initiatives.

## The Role of Technology and Data in Nature Finance

Advancements in technology and data are reshaping nature finance. Sophisticated tools enable financial institutions to better assess nature-related risks and opportunities, improving decision-making and aligning investments with global biodiversity goals. Coupled with granular asset and supply chain data, these tools offer a clearer picture of risks and impacts at the client level.

## Policy Action and Regionalization: A Call for Global and Local Efforts

Policy action is critical for mainstreaming biodiversity finance. Governments must provide incentives to drive positive outcomes for nature, while regulation can encourage the financial sector to integrate biodiversity into decision-making.

Leadership from regions in the Global South—Latin America, Africa, and Asia-Pacific—is particularly vital, as these areas face immediate biodiversity loss and climate impacts. UNEP FI is working with local actors to channel investments where they are needed most, supporting regional priorities through targeted financial solutions.

## Insurance and Transition Planning: Preparing for a Nature-Positive Future

Insurance plays a dual role as an economic enabler and risk carrier, building resilience for communities and economies. UNEP FI, through the Principles for Sustainable Insurance (PSI), continues to explore insurance strategies that mitigate risks and invest in nature-based solutions. Collaboration between banks, asset managers, and insurers is crucial to develop products and services that support the transition to a nature-positive economy.

Transition planning is equally critical. Financial institutions are working with sectors like agriculture, forestry, and fisheries to implement sustainable practices. Initiatives like TNFD and GFANZ provide guidance to set impact targets, refine due diligence processes, and create innovative transition finance strategies.

## Conclusion: Moving Beyond Discussions to Tangible Action

COP16 in Cali served as a reminder that the time for nature finance to move beyond discussion is now. The Global Biodiversity Framework sets clear targets, and

the financial sector must work relentlessly to meet these goals. Scaled North-South investment is crucial, with nature-based financial products emerging to meet the challenge. Linking these innovations to measurable GBF outcomes is paramount.

UNEP FI is at the forefront of this transition, driving the development of financial products that deliver measurable, nature-positive impacts. The time to act is now—financial institutions must align investments with the GBF to ensure a future where biodiversity thrives and economies are sustainable.

### COP29 outcomes: balancing progress and challenges on the road to climate action

COP29 held in Baku, Azerbaijan, offered an important opportunity for governments and other global stakeholders to put in place the mechanisms, tools and signals required for countries to continue implementing their contributions to the Paris Agreement as urgently needed. The main areas of negotiation were on: the design and key elements of the future climate financial architecture and the next collective quantified goal (NCQG) on climate finance; the rulebook for the future international, compliance carbon markets; and countries' collective signaling on mitigation ambition, as follow up to the various energy transition objectives captured in last year's COP28 'UAE Consensus'.

As widely reported elsewhere, while opportunities were missed to create the required clarity and determination on finance and ambition, there was some good news, even a breakthrough, on the establishment of government-backed, international carbon markets of the future.

This summary highlights the recent, impressive achievements of the UNEP FI-convened net-zero groups, progress on financing climate adaptation, and the implications for financial institutions of some of the summit's outcomes.

### Outlining the implications of COP29 outcomes for financial institutions

**On climate finance:** Governments reached agreement on financing for developing countries, firstly a 'goal' of USD 300 billion by 2035 which represents a tripling of the last goal agreed on at the Copenhagen COP in 2009, and a second wider, 'aspiration' of USD 1.3 trillion to be mobilized by 2035. It is not clear how these sums will be raised and who will deliver the finance, which may prove problematic.

**On carbon markets:** The only real breakthrough at COP29 was the finalization of rules pertaining to international, high-integrity government-backed

carbon markets, after a decade of negotiations. This is good news because carbon markets reduce the cost of decarbonization and as such can increase member states' ambition to decarbonize to the levels that we need.



### Showcasing ambitious action on decarbonisation, signalling to policymakers

UNEP FI's role at COP29 was to showcase the leadership that the finance industry is demonstrating to advance decarbonisation around the globe and sustain the ambition to keep to 1.5 degrees of warming. As the convener of the world's largest network of banks and insurers, it is part of UNEP FI's remit to remind governments and their delegations, as they take part in negotiations on their contributions to climate finance, of the commitments and the progress that large groups of financial institutions have already made, and to amplify the voice of financial institutions as they call on policymakers to take more effective action.

Through the UNEP FI-convened net-zero alliances, hundreds of financial institutions have committed to aligning all their financing with 1.5 °C, many having already set quantitative near-term targets, and are now reporting year on year on 1.5 °C compatible decarbonization progress.

### Net-Zero Export Credit Agencies Alliance: Aligning trade finance with net zero

A key UNEP FI-led initiative at COP29 was the launch of the Net-Zero Export Credit Agencies Alliance (NZECA)'s first Target-Setting Protocol. The new tool provides guidance to export credit agencies (ECAs) and export-import banks (ExIm) on setting long-term and intermediate science-based climate targets and related disclosures, helping members to fulfil the commitments they have made.

ECAs and ExIm banks play a pivotal role in financing large-scale industrial and infrastructure projects that are critical to the global economy. While the Protocol is primarily developed for setting NZECA members on the path to net zero, it can also be used by a wide variety of ECAs and ExIm banks from around the world to accelerate the decarbonisation of international trade globally. It will be updated regularly, and members will report on their target-setting progress via an annual progress report.

The NZECA Target-Setting Protocol highlights UNEP FI's ability to convene diverse stakeholders and develop actionable solutions that balance economic growth with climate objectives. The work of NZECA provides a model for aligning large-scale financing with the goals of the Paris Agreement.



### **Forum for Insurance Transition to Net Zero: Closing the gap on transition plans**

The UNEP led and convened Forum for Insurance Transition to Net Zero (FIT), launched its inaugural report at COP29. "Closing the gap: The emerging global agenda of transition plans and the need for insurance-specific guidance" is the first global guide on transition plans for insurance companies and first deliverable of the FIT Transition Plan Project.

The FIT report provides a first-of-its-kind global roadmap to help insurance companies develop and disclose credible transition plans in the context of their underwriting portfolios. To better understand the need for and importance of transition plans, the report also outlines the existing typology of transition plans, the landscape of emerging policies and regulations relevant to transition plans, and the evolution of transition plan frameworks and guidance.

Insurers, in their triple role as risk managers, risk carriers and investors, play an important role in helping to support a just transition to a resilient net-zero economy. The FIT guidance provides actionable steps to help insurers turn their climate ambition into climate action.

### **Alliances of banks and asset owners demonstrating significant progress on their commitments ahead of COP29**

In the lead-up to COP, the Net-Zero Asset Owner Alliance (NZAOA) and Net-Zero Banking Alliance (NZBA), published progress reports demonstrating that financial institutions continue to join the pioneering groups and reporting the advances they are making in setting science-based targets, publishing transition plans, and by showing increasing portfolio alignment with the Paris Agreement. NZAOA also published its updated position on governmental carbon-pricing following a call to governments to understand climate change as the largest source of systemic risk earlier in the year.

### **Calling on governments to act: over 600 financial institutions sign the Global Investor Statement on Climate Change**

The final iteration of the Global Investor Statement on Climate Change was published just ahead of COP. Over 600 institutional investors representing more than USD 30 trillion in assets under management used the statement to call for policy action, asking governments to take action in several areas such as: ensuring that 2030 and 2035 targets in Nationally Determined Contributions (NDCs) align to limit global temperature rise to 1.5°C and are submitted to the UNFCCC by early 2025; implementing robust

carbon pricing mechanisms, and removing fossil fuel subsidies and replacing them with clean energy subsidies or tax breaks that boost clean energy deployment and bolster low-emission fuels. This year, over 30 banks also added their name to the list, signaling to policymakers that these requests come from financial institutions across the industry and the globe.

### **The New Collective Quantified Goal: A blueprint for scaling climate finance**

At COP29, UNEP FI played a leading role in bringing together financial experts from public and private financial communities worldwide, from developed and developing countries, to craft a set of consolidated recommendations as to how countries should design and implement the NCQG for maximum climate mitigation and adaptation investment and impact, particularly in developing countries and emerging economies.

These expert recommendations underscore the urgency of scaling climate finance to align with the magnitude of the Paris Agreement's objectives. In fact, to set the world on a Paris-compatible path, the NCQG needs to play a catalytic role in quadrupling climate finance flows over the next two to four years, with a focus on directing resources to developing countries. UNEP FI's contributions emphasized the need to leverage public finance to unlock private capital, particularly through concessional financing mechanisms, policy reforms, and systemic interventions that create investment-friendly environments.

Key recommendations included ensuring that public finance supports regulatory and jurisdictional interventions to make Paris-aligned investments more financially viable than non-aligned ones. This strategic approach aims to address barriers to scaling private finance, particularly in emerging markets and developing economies (EMDEs), where financing gaps remain most acute.

UNEP FI's involvement in the NCQG framework demonstrates its commitment to bridging the gap between public and private finance. As negotiations progress, UNEP FI will continue to advocate for policies that enhance financial flows for climate mitigation, adaptation, and resilience.

### **Addressing adaptation finance gaps**

COP29 also highlighted the urgent need to scale adaptation finance, with UNEP FI emphasizing the role of concessional finance, metrics, and taxonomies in mobilizing private investment. The Adaptation and Resilience Investors Collaborative (ARIC), supported by UNEP FI, showcased strategies

for leveraging public finance to unlock private capital for resilience-building initiatives in climate-vulnerable regions.

These discussions underscored the importance of integrating adaptation finance into the broader climate finance framework, ensuring that developing countries have access to the resources needed to build resilience against escalating climate impacts.

### Reflecting on COP29: A foundation for future action

COP29 served as a platform for UNEP FI to demonstrate the financial sector's leadership in addressing climate challenges. Through initiatives like the NCQG, NZECA, and FIT, UNEP FI showcased the potential of finance to drive systemic change. However, the conference also revealed significant gaps in implementation, accountability, and ambition, underscoring the need for continued advocacy and innovation.

### Looking ahead

As attention shifts to COP30 in Belém, Brazil, and we note that two member states, Brazil and the UK, did convey that their next NDCs would be of much higher ambition than their previous ones, the hope that COP29 would serve as a springboard for higher levels of country ambition ahead of the next submission round of countries' climate plans in the first half of 2025 did not materialise, nor was there clarification on the previous agreement at COP28 in Dubai to triple global renewable energy capacity and double the average global annual rate of energy efficiency improvement by 2030 to support the transition away from fossil fuels.

However, UNEP FI's work at COP29 and beyond does lay a solid foundation for future progress for financial institutions to play their part in growing climate finance. UNEP FI remains committed to supporting its members in aligning financial systems with global climate goals providing the tools, insights, and partnerships needed to translate ambition into action. By providing learning opportunities, developing actionable frameworks, and advocating for systemic policy changes, UNEP FI will continue to lead the charge in mobilizing finance for a sustainable, resilient future. Together, the financial sector and its stakeholders can turn today's challenges into opportunities, ensuring a just and sustainable transition for generations to come.

### Net-Zero Asset Owner Alliance calls for regulatory mandates on Scope 3 disclosure

Geneva, 4th December: The UN-convened Net-Zero

Asset Owner Alliance (NZAOA) has released a new paper emphasising the critical role of top-down regulatory mandates in overcoming data and disclosure challenges related to Scope 3 emissions.

As regulations on these emissions evolve worldwide, with the Corporate Sustainability Reporting Directive (CSRD) in the European Union and emerging regulatory frameworks in Japan and California, the NZAOA's new paper highlights the growing urgency for standardising disclosure and the need for policymakers to act decisively.

The report finds barriers to tackling these emissions—which account for three-quarters of most companies' total emissions—persist. For asset owners, the barriers include limited data quality, inconsistent accounting frameworks, and double-counting risks, which make it challenging to integrate these emissions into portfolio steering and overall climate strategy.

The paper sets out actionable advice for asset owners, enabling them to make meaningful progress, while driving public discourse and pushing for regulatory change. For efficient action, the NZAOA recommends corporates to focus in the first instance on their two most significant categories, which would allow them to cover on average 81 per cent of the overall Scope 3 emissions intensity in each sector.

Based on in-depth sectoral analysis, the five steps for asset owners that can be adopted immediately, include:

- Disclosure ambition: Asset owners can seek improved emissions disclosures from issuers, including independently verified or audited annual Scope 3 emissions estimates.
- Relying on corporates with Scope 3 targets: Asset owners may over time and on an individual basis start to shift towards investments in underlying issuers with approved Scope 3 targets.
- Engagement objectives: Asset owners can focus on engaging with issuers or sectors where Scope 3 emissions are deemed most significant or where disclosure is lacking.
- Sector targets: Asset owners may include Scope 3 emissions in sectoral financed emissions reduction targets, as already outlined in the Alliance's Target-Setting Protocol (2024).
- All-encompassing reductions: In case asset owners chose to include investees' Scope 3 emissions in their reduction targets, these may be kept separate from established Scope 1 and 2 targets.



Udo Riese, Global Head of Sustainable Investing, Allianz Investment Management, and NZAOA Monitoring, Reporting, and Verification Track Lead



comments:

"Our paper highlights the need for credible and comparable Scope 3 data, or else we will not see necessary carbon reductions in the real economy. While we are sending a clear signal to the market that regulatory mandates are needed for systemic progress, asset owners recognise the importance of taking responsibility and demonstrating leadership through actionable strategies now."

#### **About the UN-convened Net-Zero Asset Owner Alliance**

The UN-convened Net-Zero Asset Owner Alliance is a member-led initiative comprising 89 institutional investors with US\$9.5 trillion in assets under management. These investors are individually committed to aligning their investment portfolios with the Paris Agreement's goal of achieving net-zero GHG emissions by 2050. The Alliance, convened by UNEP FI and PRI, with support from WWF and Global Optimism, was the first in the financial industry to define intermediate targets and provide annual progress reports.

#### **More than 600 investors call on world governments at COP29 to implement critical climate policies**

The Founding Partners of the Investor Agenda, including UNEP FI, announce that the 2024 Global Investor Statement to Governments on the Climate Crisis has closed, with 650 investors representing USD 33 trillion in assets under management (AUM) supporting the call for action.

Coordinated by the Founding Partners of the Investor Agenda – Asia Investor Group on Climate Change, CDP, Ceres, Investor Group on Climate Change, Institutional Investors Group on Climate Change, Principles for Responsible Investment, and UNEP Finance Initiative – the global investor statement calls on governments to increase the ambition of their updated Nationally Determined Contributions (NDCs) due to be submitted next year.

It is a critical time for investors to bring together their voices and advocate for clear and tangible global climate policies ahead of the biggest climate event of the year – COP29. The Founding Partners have coordinated global investor calls to action urging governments to step up climate policy action since 2009.

The statement will be presented to governments at COP29 via the official side event Accelerating Global Investor Climate Action to Achieve the Paris Agreement's Goals on 15 November in the COP29 Blue Zone – room Side Event 8 at 18:30-20:00 (AZT), in Baku, Azerbaijan. Attendees need in person or

virtual accreditation to join.

Effective policies are essential at all levels of government to accelerate the private capital flows needed for a climate-resilient, nature-positive, and just net zero transition. Therefore, the Global Investor Statement encourages a whole-of-government approach to implement policies in line with countries' nationally determined contributions (NDCs) and a 1.5°C scenario, recognizing common but differentiated responsibilities and respective capabilities between emerging and developed economies, that will accelerate private sector action and large-scale investment. To achieve these goals, we call on governments to:

1. Enact economy-wide public policies.
2. Implement sectoral strategies, especially in high-emitting sectors.
3. Address nature, water and biodiversity-related challenges contributing to and stemming from the climate crisis.
4. Mandate climate-related disclosures across the financial system.
5. Facilitate further private investment into climate mitigation, resilience and adaptation activities in emerging markets and developing economies.

To help advance the climate transition, investors are also encouraged to develop and implement comprehensive Investor Climate Action Plans (ICAPs) and align their investments with the goal of net-zero emissions by 2050 or sooner, with credible interim targets, among other actions. Policy advocacy, such as the Global Investor Statement, is a critical pillar within the Investor Agenda's Investor Climate Action Plans framework.

#### **About The Investor Agenda**

The Investor Agenda is a common leadership agenda on the climate crisis that is unifying, comprehensive, and focused on accelerating investor action for a net-zero emissions economy. The founding partners of The Investor Agenda are seven major groups working with investors: Asia Investor Group on Climate Change, CDP, Ceres, Investor Group on Climate Change, Institutional Investors Group on Climate Change, Principles for Responsible Investment and UNEP Finance Initiative.

#### **COP16: A Historic People's COP Sets the Stage for Nature-Positive Action**

The "People's COP," COP16 took over Cali, Colombia, in an unprecedented display of unity and purpose, setting new records for engagement and inclusivity. Against the vibrant backdrop of salsa music, local culture, and impact-driven discussions,

this event brought together more than 700,000 participants who passed through the green zone—including 23,000 registered delegates, a record for any CBD COP. The whole-of-society approach was evident, as representatives from finance, Indigenous peoples and people of African descent and their communities, youth, and environmental organizations collectively tackled some of the most pressing issues for nature and society.

Under the theme “Peace with Nature,” this year’s conference was deeply rooted in the idea that achieving biodiversity goals requires a collective commitment across all sectors of society. The Colombian COP16 Presidency championed this approach, aligned with the Kunming-Montreal Global Biodiversity Framework’s targets, including protecting 30% of land and sea areas globally, restoring 30% of degraded ecosystems by 2030, reducing pollution, and phasing out harmful subsidies in agriculture and other sectors.

### Key Highlights: Tackling Biodiversity and Finance Gaps

The conference served as a crucial checkpoint for assessing progress toward the 23 biodiversity targets and four goals set at the COP15. These goals reflect ambitious, globally agreed-upon actions, including an allocation of \$200 billion per year from all sources to support biodiversity. Finance and Biodiversity Day—only the second of its kind—was a focal point, drawing over 1,000 finance sector representatives during the day to discuss the urgent need to bridge the biodiversity funding gap and channel resources toward meaningful outcomes. UNEP FI and its partners facilitated over 90 events in the green and blue zone, including the first Finance and Biodiversity pavilion focused on aligning financial flows with national biodiversity strategies and action plans (NBSAPs), emphasizing the importance of preserving ecosystems like the Amazon basin.

In a significant move toward action, UNEP FI member Banco Davivienda, in partnership with the IFC, launched a \$50 million biodiversity bond aimed at protecting and restoring Colombia’s biodiversity. This bond is a pioneering example of how the finance sector can innovate to deliver real nature-positive impacts. Finance and Biodiversity Day highlighted the need for robust policy frameworks that can direct finance toward achieving biodiversity goals, making it clear that systemic change relies on multi-stakeholder collaboration. This was just one of the many discussions at Finance and Biodiversity Day that underscored the finance sector’s role in driving nature-positive outcomes at COP16.

### Landmark Decisions on Genetic Resources and Indigenous Representation

COP16 also achieved historic agreements on sharing profits from digital sequence information (DSI) – genetic codes coming from organism samples that are often shared digitally – and its fair, equitable distribution—a field where developing communities have often seen little benefit despite the data’s use in high-profit industries like pharmaceuticals and cosmetics. This fund, that could generate as much as \$1 billion annually, marks a meaningful step toward equitable benefit-sharing. Additionally, delegates approved the creation of a permanent body to represent Indigenous People’s and those of African descent and their communities’ interests within the UN’s Convention on Biological Diversity. This permanent body not only provides Indigenous voices with a direct platform but also underscores the critical role their knowledge and practices play in achieving the goals of the Global Biodiversity Framework.



### Key UNEP FI Publications at COP16: Building a Roadmap for Nature-Positive Finance

COP16 underscored the finance sector’s growing responsibility in translating biodiversity commitments into measurable outcomes. UNEP FI played a pivotal role in this journey by launching a suite of essential publications that provide actionable guidance for financial institutions aiming to support the goals of the Kunming-Montreal Global Biodiversity



Framework. These resources are invaluable tools for navigating the complexities of nature-positive finance and integrating biodiversity considerations into decision-making at the highest levels.

1. PRB Sector Action Guidance for Nature: Getting Started in the Agricultural, Forestry, and Mining



**Sectors:** This guidance supports financial institutions in aligning their portfolios with biodiversity goals, specifically within high-impact sectors like agriculture, forestry, and mining. By offering sector-specific insights, this publication encourages financial institutions to drive nature-positive practices where they are most needed.

2. **Nature in the Boardroom:** Recognizing that biodiversity loss impacts business resilience, this publication outlines strategies for integrating nature considerations into boardroom discussions. It serves as a resource for boards to assess nature-related risks and opportunities, fostering a culture of environmental stewardship at the executive level.
3. **From Kunming-Montreal to Cali: Is the Financial System on Track?:** Also known informally as the CBD Scorecard, this report evaluates the progress of the finance sector in aligning with

the Global Biodiversity Framework's objectives. It provides a crucial benchmark for financial institutions, highlighting areas where further alignment is necessary to meet the 2030 biodiversity targets.

4. **Finance for Nature Positive Discussion Paper:** Released in the lead-up to COP16, this paper explores pathways for scaling finance for biodiversity. It serves as a foundational document, sparking dialogue on how the finance sector can accelerate efforts to bridge the biodiversity funding gap.
5. **Soft Launch: Priority Actions for Insurance to Contribute to a Nature-Positive and Resilient Future:** the soft-launch of the Principles for Sustainable Insurance Guidance on Priority Actions for Insurers to Contribute to a Nature-Positive and Resilient Future.



## KEY HIGHLIGHTS FROM BAKU AND WAY FORWARD

24 November, 2024 marked the closure of the negotiations of the 29th Conference of Parties (COP 29), which was conducted in Baku in Azerbaijan. The COP this year was considered to be crucial given the focus on reaching a decision with regards to commitments around the New and Collective Quantified Goal on Climate Finance (NCQG). Apart from the focus on climate finance the COP sought to make some headway with regards to the Global Goal on Adaptation, the Mitigation Work Programme, Article 6 and market-based approaches, the Loss and Damage Fund and the UAE Dialogue on Just Transition.

COP 29 was expected to reach an agreement on many of these agenda items keeping in mind the principles of the United Nations Framework Convention on Climate Change on common but differentiated responsibilities (CBDR) acknowledging the needs of the developing countries. In light of the heightened concerns of the IPCC on temperature rise and the Paris Agreement Goals of remaining below the 2 degrees Celsius mark, aiming to limit at 1.5 degree Celsius, countries had estimated the support that is needed to be scaled up. However, the decision for finance support by developing countries considerably fell short of the requirements stated by them.

The developing countries had estimated the need for finances to the tune of 5.1 to 6.8 trillion USD through 2030 to be made available as public finance in the form of grants and its equivalence. After 3 years of deliberations, the NCQG on climate finance was to be agreed to mark a revision from the 100 billion USD agreed in Cancun. However, COP 29 concluded with mobilisation of 300 billion USD annually by 2035 as resources to be made available to the

developing countries for support for implementing their climate actions. It also called for mobilisation of 1.3 trillion USD investments in developing countries by 2035 which mentions inclusion of domestic resources. The decision also sought to diversify the sources for contributions of this finance to developing countries including the public, private sectors and other forms of finance support including multilateral development banks (MDBs). The agreed amount ultimately is a huge underestimate of the required resources for developing countries to meet their NDCs and raise ambitions overall contributing to an effective strategy for Mitigation worldwide.

However, the silver lining in the negotiations related to the adoption of Article 6 in advancing the carbon markets. The COP led to decision making around Article 6.2 and 6.4. While Article 6.2 enables bilateral agreements for trading carbon credits from emission reduction or removal projects, Article 6.4 aims to set up a global carbon market. This allows for space for countries to set up internal mechanisms that can help develop projects and screen them. However, the guidelines supporting market mechanisms will need to be detailed out to allow countries to review the nature of projects that can be developed. For instance, the treatment of additionality in the text and in this case to be able to qualify all projects that are clean energy driven. The scale of projects that will be developed will entirely depend on many of these factors. It is estimated the markets may assist in filling the gaps in the climate finance dictated above, however, establishing the markets and the trade around it may take time and shall not be able to fill the immediate gap needs may undermine the abilities of many developing countries in delivering on their climate actions.

The Global Goal on Adaptation (GGA) saw progress with regards to the establishment of the Baku Adaptation Road Map and a high-level dialogue to enhance the implementation of the UAE Adaptation Framework. So far experts have outlined many indicators and need to be refined further, the work program indicates work to proceed over the next year to refine these indicators. Besides the role of Indigenous Peoples and local communities was highlighted and included in the process.

However, the COP failed to discuss the means of implementation for adaptation actions and resources needed by countries. The finance discussions were a huge underestimate in this context. Besides, there is a strong need for understanding the scales at which GGA should be pitched as leading to the national and local level creates duplication of efforts already being led by countries through the NAP process and National Communications. There is a need for global aggregation of indicators that matter at larger scales to be clearly identified for instance relating to matters



of food security, trade, health security etc.,

COP 29 operationalized the loss and damage fund with the following decisions by adopting a host country, a financial intermediary for the next 4 years and pledges made by countries amounting to more than 700 million USD. However the need for clarity on the beneficiaries, the system to be used for disbursements etc are being worked on and needs elaboration.

The UAE Dialogue on the GST is to be addressed in June 2025 in the Subsidiary Body sessions with a draft decision in the next COP in Belem. The UAE Just Transition Work Programme did not see much progress, besides discussions to round up on other issues surrounding unilateral trade measures.

COP 29 was a disappointment for developing countries given the reluctance of the developed countries in providing support in line with the principles of the UNFCCC to aid developing countries in meeting their goals of climate actions that are needed to be implemented. Already an underestimated value that was indicated by the developing countries for support, the level of commitment of resources fall tremendously short thereby disadvantaging many developing countries in meeting their climate goals. This includes MoI for both mitigation and adaptation further creating inequities across the world.

There is a need to introspect on the processes followed that should have abided by the principles of the UNFCCC and the decisions taken. COP 30 in Belém, Brazil will have huge expectations to emphasise on standing by the principles of the UNFCCC providing for adequate support to the developing countries. The road ahead is challenging

for each country but needs to be traversed with trust and confidence in the systems that have been laid out to meet the ultimate challenge that climate change poses to this generation and the next. India has proposed to host COP 33 and which is yet again a landmark COP as decisions for MoI are to be taken in 2028. There is thus a need to focus on strengthening the agenda around many issues as we move for a decisive COP by 2028.

### **Bio profile – Ms Suruchi Bhadwal**

Ms Suruchi Bhadwal is engaged with the Earth Sciences and Climate Division of The Energy and Resources Institute (TERI) as Director. She has been with TERI since October 2000 and has contributed to several projects with a focus on advancing scientific understanding of climate change and its impacts on natural and human systems. Sectors of focus have been agriculture, water resources, health and infrastructure. She has connected the research to people in understanding the community dimension of the impacts of climate change and worked on policies to help provide solutions. She has contributed to several international reports including the UNHDR, GEO reports and the IPCC. Her most recent contribution has been to the IPCC AR6 WG II report with a focus on key risks. She has worked on several projects with the government at the national level and has worked with States and at the Local level.

**Ms Suruchi Bhadwal,**  
Director,  
Earth Science and Climate Change



## COMMON DESIGN REUSABLE PACKAGING

### Doing More with Less



### RAJAN MEHTA

Publisher of a Bestselling Book – Backstage Climate. He has been a serial tech entrepreneur and is now building Climate Action Labs.

Most of the goods we consume come with some sort of packaging. While the goods are consumed, the packaging is essentially discarded. We drink beer but throw the bottles; we consume medicines but discard the phials. Most of this packaging ends up in landfills, incinerators, or just litter around.

With increased consumerism and population growth, packaging waste has been increasing significantly. The global average per capita waste created by packaging is somewhere in the tune of 186.5 kilograms per person per year. USA leads with 239 kilograms, while India is at 9, but growing exponentially. Imagine the situation as India grows and its average per capita packaging waste inches closer to that of the US.

Besides consuming natural resources like trees, fossil fuels, and other minerals and metals, there is a significant amount of energy consumed in the production of packaging. All this culminates in resource depletion, greenhouse gases, and pollution - ground, water and air! These are factors responsible for the deteriorating environment, changing climate and falling human health.

Plastics which constitute 40% of the packing material are not bio-degradable and remain in the environment for centuries. Only 9 % are recycled. Most end up in oceans where they impact marine life. The balance ends up in landfills or is incinerated. In either case, they release greenhouse gases and other toxins. Unbridled plastic use is also creating microplastic waste which has now found its way to the human bloodstream as well. A recent survey done in the Netherlands found some 77 % of human blood samples taken had microplastics in them. Microplastics are known to cause inflammation in the body, increase oxidative stress, and disrupt our endocrinial system.

Another 30% of the packaging comes from paper and cardboard. While biodegradable, it is resource intensive leading to deforestation, and excessive use of water and energy. Similarly, metals, glass, wood, and other materials used in packaging have an environmental, climate and health impact.

Can we do away with packaging completely? No.

Can we reduce the total amount of packaging? Yes.



## REUSABLE PACKAGING: COMMON DESIGN



Packaging is essential and has many benefits including protecting the products from damage, increasing their shelf life and making them easily transportable. However, its life is ephemeral – ending as soon as we buy or consume a product. It follows a linear model – where we take material resources, use some energy to convert them into packaging, use it to house the product and then throw the packaging as soon as we use the product. This is wasteful.

The model can instead be made circular, where packaging once produced can be used and reused over and over. This practice can be adopted industry-wide by introducing a Common Design Reusable Packaging system. The idea is not new. The same principle was applied when shipping containers were introduced for international freight. The focus there was optimizing freight volume, whereas the idea here would be to optimize material resources and energy.

The first step in this process of creating a Common Design Reusable Packaging system would be to standardize packaging design for various product categories. This includes selecting materials that are strong, nonpolluting and easily recyclable and also agreeing on physical aspects like shape, size, labeling spaces and other specifications that are acceptable to all parties. Such a design would enable the same packaging to be used by different manufacturers. An ecosystem for collecting used packages from the consumers, cleaning them, listing them on a digital exchange for buying and selling, and then shipping them to the manufacturers for reuse will need to be set up.

### The same packaging could do multiple rounds.

This is no slam-dunk and calls for massive Industry cooperation. Regulators may have to step in and enforce cooperation – where industry players cooperate and compete at the same time. It could be a tricky marketing issue for companies and therefore should first be tried only for categories where packaging is less of a differentiating factor and has a lower influence on consumer choice. Things like medicines, spirits and generic food items could be good initial candidates. The branding can still happen through changeable labels though. Such a system would reduce the need for overall packaging and thus lower environmental pollution, greenhouse gases and the energy used for their manufacture.

One may ask, why do we need to standardize packaging design? Why cannot every manufacturer collect their own packages and reuse them? The logistics and expense involved in collecting back packaging of a specific manufacturer and getting it

back to him for re-circulation would not be a viable option - both financially and logically. Hence adopting a common standardized packaging design in the industry for a similar pool of products becomes essential so that geographically dispersed, used packages can be economically collected and shipped to whichever manufacturer needs them, based on



marketplace dynamics. The transactions could be facilitated by a digital exchange.

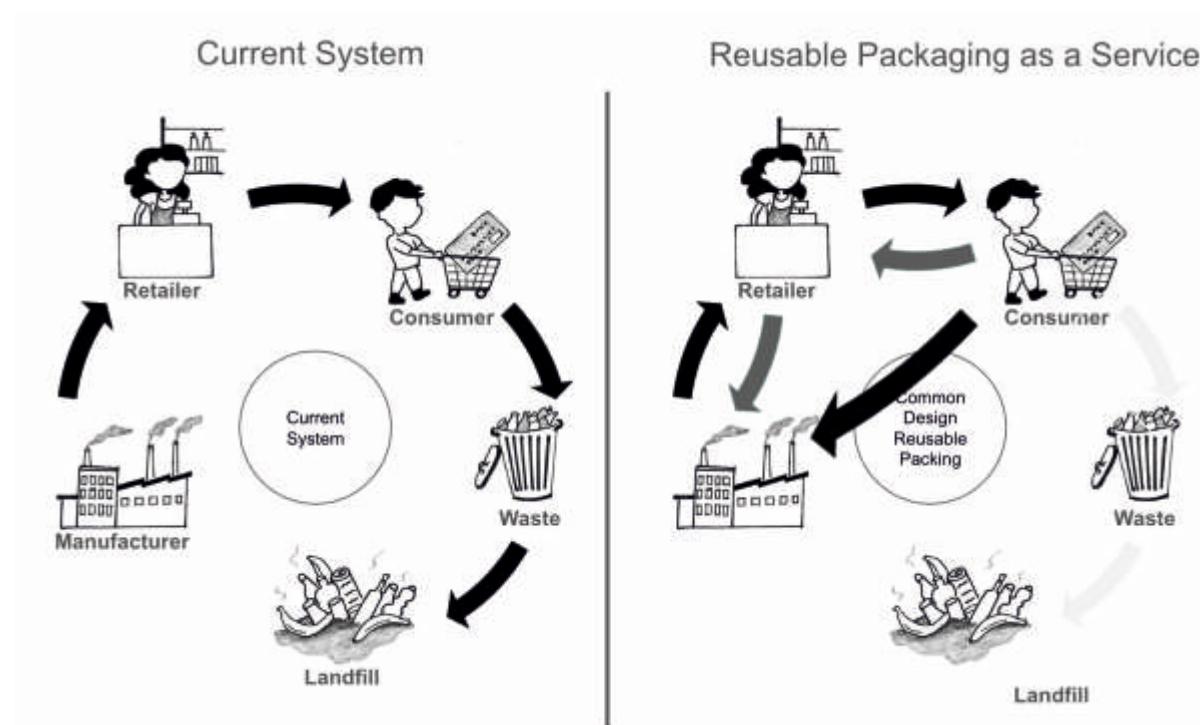
This needs a gargantuan effort and calls for a mix of industry coordination, policy promulgation, infrastructure development and systems set-up, backed by a consumer awareness drive.

### The stakeholders in this initiative will be:

**Corporations:** We will need to carefully select industry groups for whom packaging is less of a basis of competition, for example pharma industry with its phials, the spirits industry with its wine and beer bottles, oil industry with its lubes. By adopting a common design, they will not only help solve the



## REUSABLE PACKAGING: COMMON DESIGN



*Illustration by Sona Mehta*

environmental issues but will also be able to increase their profitability by reducing packaging costs through reuse.

**Municipalities / Governments:** We will need to advocate the promulgation of suitable laws and regulations for mass adoption of reusable packaging. They will stand to benefit, as their burden for waste disposal will reduce and cities will become cleaner.

**Consumers:** We will need to suitably educate and incentivize the consumers to partake in the ecosystem by returning used packaging for recirculation.

I believe the timing to initiate this program is now. As we know, a change can be best accomplished during a period of disruption. We are currently seeing a major disruption in the retail industry as it shifts from a conventional brick-and-mortar model to an online and omni-channel format. This is changing the relationship between consumers and product packaging. In a brick-and-mortar retail environment, packaging serves the function of merchandising and protection while in an online environment, its function changes to ease of shipment and protection. Add to

that, consumer awareness and public concern about sustainability. Both are currently high and hence the timing could be opportune for introducing Common Design Reusable Packaging.

A corollary benefit of this system besides environment, climate and health would be additional employment generation, as it opens up a new sector that needs people to collect, clean and handle the circulation of packages.

### About the Author

Rajan Mehta is a Harvard ALI Fellow 2022 and publisher of a Bestselling Book – Backstage Climate. He has been a serial tech entrepreneur and is now building Climate Action Labs.

The article was first published in Harvard University's Social Impact Review

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## COMPANY PROFILE VIYEN BIOTECH



### KARTHIK KUMAR

Founder and CEO

#### The Vision Behind Viyen Biotech

Viyen Biotech, founded in Coimbatore, Tamil Nadu, India, operates under a Bio-Circular-Green (BCG) economic strategy aimed at enhancing agricultural productivity through innovative biotechnology. This approach is not merely a business model but a comprehensive vision that seeks to transform the agricultural landscape by integrating sustainable practices with advanced scientific research. The core vision of Viyen Biotech is to serve the farming community by delivering high-quality agricultural products, including nano fertilizers, biofertilizers, biopesticides, and biostimulants. This commitment is deeply rooted in the belief that scientific advancements can revolutionize agriculture, making it more efficient and resilient against climatic challenges. The company aims to meet the diverse needs of both national and international markets, ensuring that farmers have access to cutting-edge solutions that enhance crop yields while promoting environmental sustainability.

#### Personal journey and leadership

As a first-generation entrepreneur and biotechnology innovator from the south India, I have

dedicated my efforts to creating sustainable solutions that address the pressing challenges faced by farmers, particularly in the context of extreme climatic conditions. In our region, farmers are significantly affected by severe climatic stresses, including cold temperatures and water scarcity, which often lead to substantial crop losses.

In my role as the Founder and Chief Executive Officer of Viyen Biotech, I am committed to advancing sustainable agricultural practices through innovative biotechnological solutions. My primary focus is on developing nano fertilizers that enhance crop resilience in high-altitude regions, where the impacts of climate change are acutely felt. I believe that these nanotechnological solutions represent a robust approach to mitigating the adverse effects of climatic barriers on agriculture.

My vision aligns seamlessly with this mission; I aim to contribute to sustainable food systems that not only support local farmers but also actively combat the environmental crises we face today. Understanding and addressing sustainability issues from the perspective of the Viyen Biotech resonates deeply with my commitment to creating equitable solutions

# COMPANY PROFILE VIYEN BIOTECH

for all stakeholders involved in agriculture. Through this journey, I aspire to empower farmers with innovative tools that enhance their productivity while ensuring environmental sustainability.

## Innovations by Viyen Biotech

BIO-exPA is formulated using green nanotechnology, which focuses on essential micronutrients that activate plant growth and enhance nutrient uptake. This eco-friendly product not only improves the metabolic activities of plants but also promotes the efficient absorption of both macro and micronutrients.

### The unique selling propositions of BIO-exPA include:

**Enhanced Crop Productivity:** Viyen Biotech's innovations can increase crop yields by 10% to 15%, providing farmers with a significant boost in productivity.

**Stress Resistance:** The nano fertilizers effectively combat both biotic stresses (such as microbial infections) and abiotic stresses (including cold temperatures and drought conditions). Additionally, they possess antifungal properties that further protect crops from various threats.

**Compatibility with Various Cultivation Systems:** BIO-exPA is versatile and can be used in organic, chemical, hydroponic, and vertical garden systems, making it suitable for a wide range of agricultural practices.

### 1) Impact on the Agricultural Ecosystem

The introduction of BIO-exPA has profound implications for the agricultural ecosystem:

**Mitigating Crop Losses:** Farmers often face significant crop losses due to biotic and abiotic stresses, including high rainfall, drought conditions, and pest attacks. By enhancing resistance to these stresses, BIO-exPA helps reduce losses and stabilize yields.

**Addressing Eco-Toxicity:** The reliance on synthetic fertilizers has led to soil toxification, nutritional imbalances, and the eradication of beneficial



microflora. Viyen Biotech's eco-friendly nano fertilizers offer a sustainable alternative that minimizes residual effects on soil health.

**Reducing Dependency on Imports:** India currently meets 50% of its fertilizer demand through imports. By developing effective domestic solutions like BIO-exPA, Viyen Biotech contributes to reducing this dependency and promoting self-sufficiency in agricultural inputs.

## Challenges in the Sector

Despite these advancements, the agricultural sector faces several challenges:

**Crop Losses:** Farmers continue to struggle with losses attributed to climatic fluctuations and pest pressures.

**Eco-Toxicity:** Traditional synthetic fertilizers contribute to long-term soil degradation.

**Fertilizer Demand:** The lack of viable local sources for fertilizers highlights the need for innovative domestic solutions.

Viyen Biotech's innovations represent a significant step forward in creating sustainable agricultural practices that not only enhance productivity but also protect the environment. By focusing on developing robust solutions like BIO-exPA, Viyen Biotech is poised to make a lasting impact on the agricultural ecosystem, empowering farmers while addressing critical challenges posed by climate change. Through its commitment to sustainability and innovation, Viyen Biotech is leading the charge towards a more resilient agricultural future.

As the Founder and CEO of Viyen Biotech, I have witnessed firsthand the myriad challenges that our agricultural sector faces, particularly in the context of climate change and environmental stress.



# REDUCING SHORT-LIVED CLIMATE POLLUTANT EMISSIONS FROM WASTE

Many common waste disposal methods generate short-lived climate pollutants like methane and black carbon - powerful climate forcers that damage our environment and health. Changing our consumption habits and managing waste differently are important steps in the fight against climate change and air pollution.



Without action,  
global waste  
could grow by

**70%**  
by 2050

**OPEN BURNING**  
*40% of all waste is  
openly burned*



**BURNING WASTE**  
produces multiple air pollutants,  
including black carbon



**ORGANIC WASTE**  
*1/3 of all food produced  
goes to waste*



FOOD SCRAPS



GARDEN WASTE

**METHANE**

A powerful greenhouse gas  
that also leads to ground-level ozone pollution

Impacts:

**LANDFILL GAS**

*3rd largest human-made  
source of methane*



**ANAEROBIC DECOMPOSITION**  
of organic waste produces  
methane, carbon dioxide,  
and other gases

**BLACK CARBON**

A dangerous air pollutant  
that also contributes to  
global warming

Impacts:

## WE CAN STOP EMISSIONS WITH



### OPEN BURNING ALTERNATIVES

Improved waste management services  
reduce the need to burn waste



### WASTE PREVENTION AND SEPARATION

Diverting organic waste from landfills  
prevents emissions



### LANDFILL GAS CAPTURE

Existing technology  
can cut emissions

*by +60%  
by 2030*

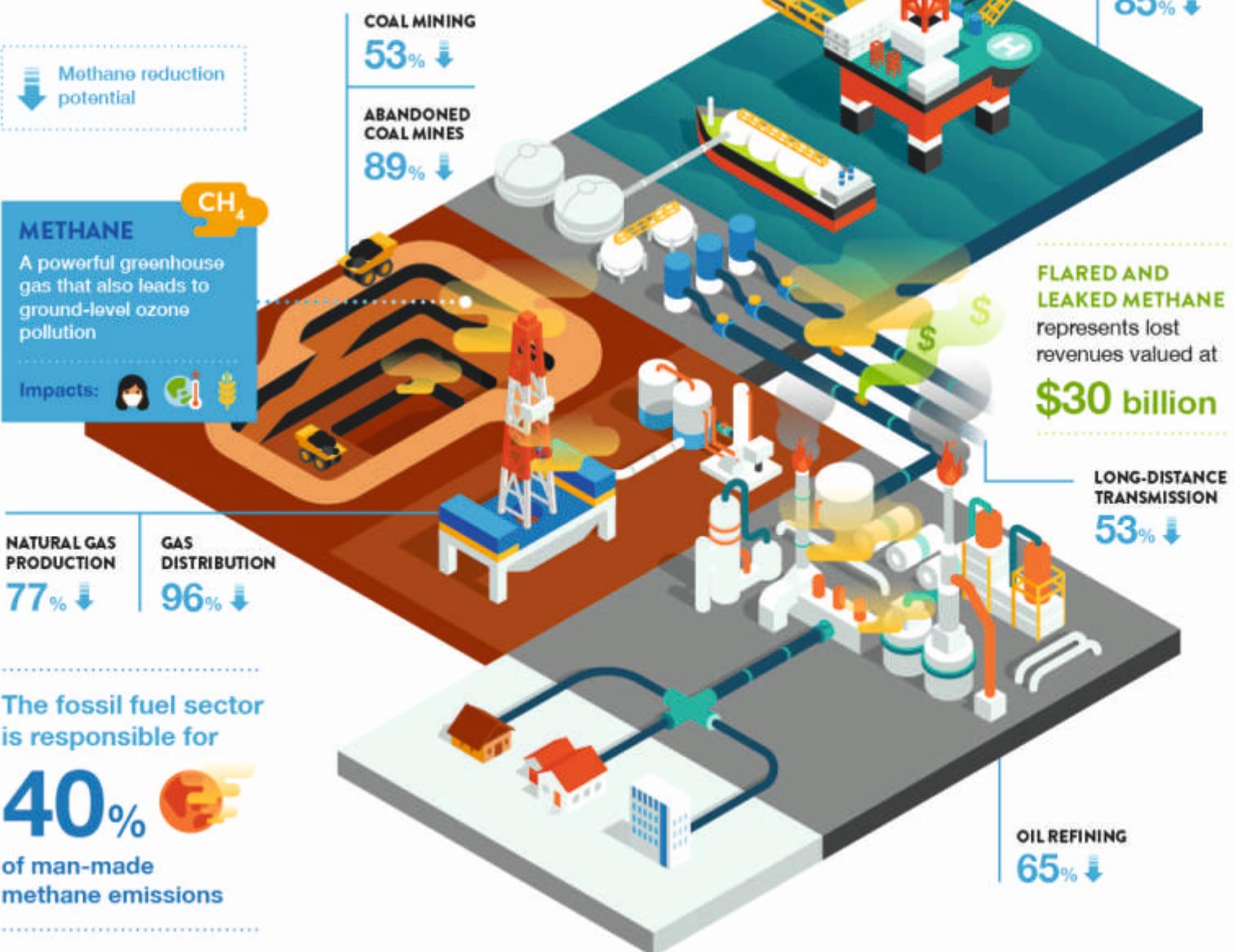


CLIMATE &  
CLEAN AIR  
COALITION  
TO REDUCE SHORT-LIVED  
CLIMATE POLLUTANTS

[www.ccacoalition.org/waste](http://www.ccacoalition.org/waste)

# FOSSIL FUEL SECTOR EMISSIONS: QUICK WINS FOR THE CLIMATE AND CLEAN AIR

Natural gas can play an integral role as a cleaner energy source as countries de-carbonise, but only if methane and black carbon emissions from its production and distribution are significantly reduced. The good news is that the technology solutions already exist and can be implemented at little or no cost to companies.



## HOW TO REDUCE EMISSIONS?



### COMPANY ACTION

Responsible management and reduction of methane and black carbon emissions



### METHANE MONITORING

Scientific measurements of emissions to guide government and company actions



### REGULATIONS

National methane emissions reduction targets and sound policies and regulations



### INTERNATIONAL COLLABORATION

Sharing international best practices for managing and regulating methane



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[www.ccacoalition.org/oil-gas](http://www.ccacoalition.org/oil-gas)

# REDUCING SHORT-LIVED CLIMATE POLLUTANTS FROM AGRICULTURE

The agriculture sector is one of the largest sources of methane and black carbon - dangerous air pollutants that also play a significant role in climate change.

Reducing emissions from the sector is an important part of the fight to tackle climate change and air pollution and will help ensure food security for the world's population.



## SOLUTIONS

Reducing emissions is going to take a combination of technological solutions and behavioural change

### ANIMALS



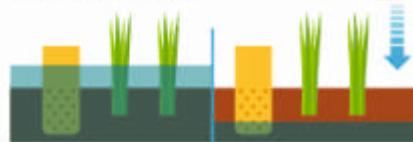
- Improving feed and animal health



- Capturing methane as a source of energy
- Better manure management practices



### RICE PADDIES



- Alternate wetting and drying practices

### OPEN BURNING



- Reusing crop stubble instead of burning it



### BEHAVIOURAL CHANGE



- Shifting to more sustainable diets



- Reducing food loss and waste



# HOUSEHOLD ENERGY AND AIR POLLUTION

The use of polluting fuels and technologies for cooking, heating and lighting harms human health and the environment. Access to and long-term use of clean energy is essential for reducing air pollution, combating climate change and ensuring equitable development.

Finance for clean cooking solutions is far below the estimated USD 5 billion required annually to 2030 to ensure universal access.

Household cooking, heating and lighting produces more than

**50%** 

of human-made black carbon emissions

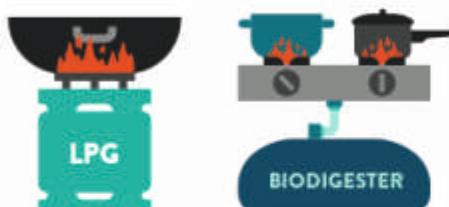
Household air pollution contributes to almost

**4 million**   
premature deaths annually

**600,000**   
due to acute lower respiratory infections among children under 5 years of age



## SOLUTIONS



### CLEANER AND MORE ENERGY EFFICIENT COOKSTOVES

using cleaner fuels like electricity, ethanol, pellets, and solar



### OFF-GRID SOLAR ENERGY

can provide electricity to light rural households



### IMPROVED HEAT STOVES

cut pollution and fuel expenses



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[www.ccacoalition.org/energy](http://www.ccacoalition.org/energy)

## BENEFITS OF MITIGATING METHANE

Reducing methane emissions by  
**45%** by 2030 means

**CLIMATE**  
**0.3°C** warming  
avoided by 2040

Putting us on track to achieve the  
**1.5°C** target  
of the Paris Agreement

reducing the risk of  
climate tipping points



### AIR QUALITY

Reducing the formation of  
**ground-level ozone**  
pollution  
a primary component of smog



preventing every year

### HEALTH



**~255,000**

respiratory and cardiovascular  
deaths

~775,000 asthma-related  
hospital visits

### LABOUR



**73 billion hours**  
of lost work

due to heat exposure

the equivalent of roughly  
**35 million full-time jobs**

### FOOD SECURITY



The loss of **26 million tonnes**

of maize, rice, soy and wheat due to  
ground-level ozone pollution

A saving worth roughly  
**US\$7 billion**

Every year, these benefits  
would be equal to a global  
saving of approximately

 **US\$470 billion.**

and contribute to achieving the  
**SUSTAINABLE DEVELOPMENT GOALS**

# Time is ticking

Poised towards a Sustainable Future.



**Net** **green**  
FOUNDATION



## MEET YOUR NEW ECO-FRIENDLY DELIVERY HEROES.

The Deliva and Byka are here to save the day - and the planet. Built for speed, efficiency, and zero emissions, they're the ultimate companions for eco-conscious deliveries.



CHARGING FORWARD,  
ONE DELIVERY AT A TIME.

DISCOVER YOUR HEROES  
[ONE-MOTO.COM](http://ONE-MOTO.COM)



A close-up photograph of a gorilla's face, framed by a dense thicket of large, dark green leaves and vines. The gorilla has dark fur and is looking directly at the camera with a neutral expression. The lighting is natural, filtering through the leaves above.

Earth's survival, our priority

Poised towards a Sustainable Future.