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ROUNDTABLE SUMMARY

Our Shared Responsibility: Technologies Accelerating the Path to Green Financing

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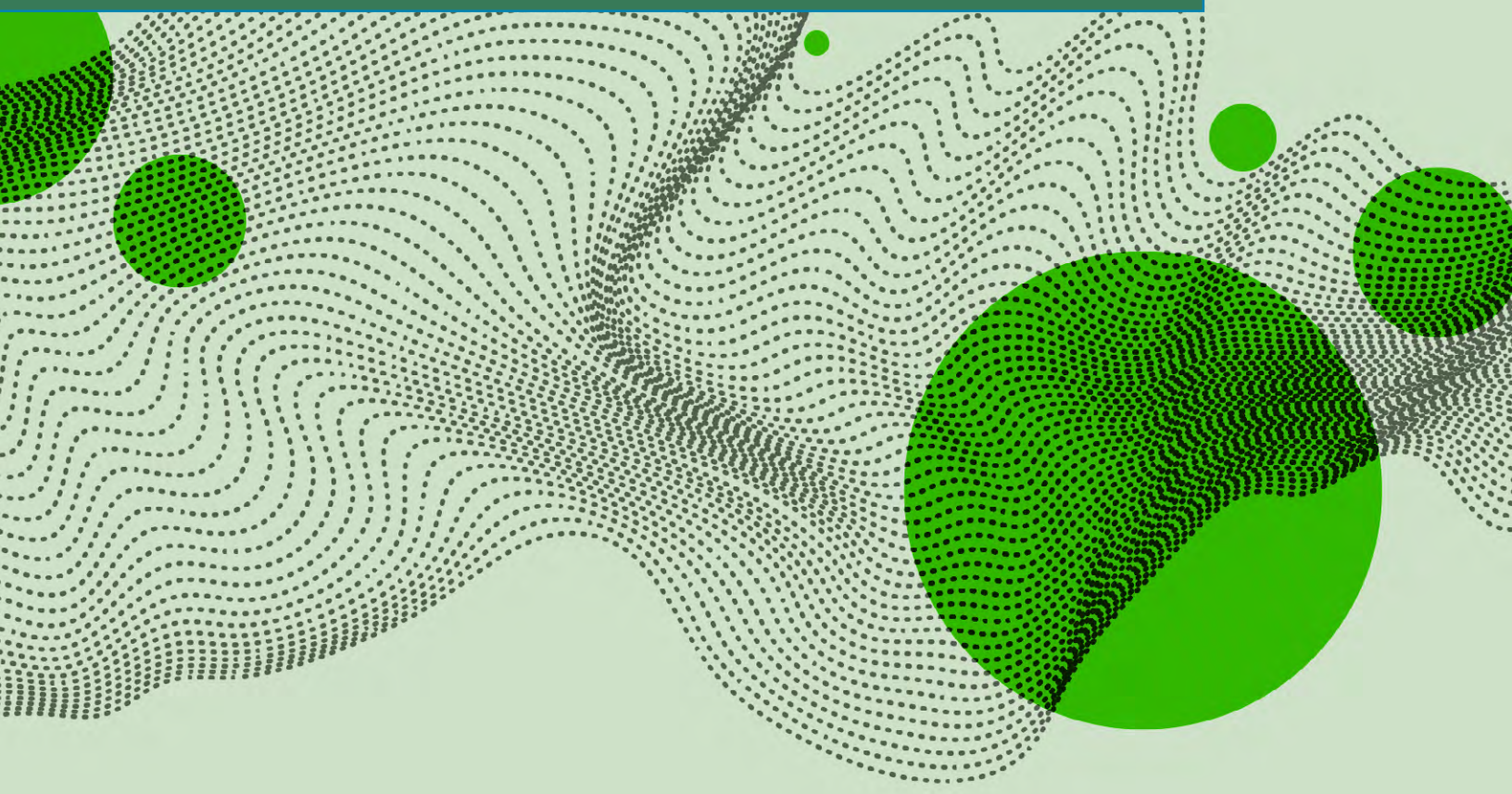

ABOUT THE MILKEN INSTITUTE

The Milken Institute is a nonprofit, nonpartisan think tank focused on accelerating measurable progress on the path to a meaningful life. With a focus on financial, physical, mental, and environmental health, we bring together the best ideas and innovative resourcing to develop blueprints for tackling some of our most critical global issues through the lens of what's pressing now and what's coming next.

ABOUT THE ASIA CENTER

The Milken Institute Asia Center extends the reach and impact of Milken Institute programs, events, and research to the Asia-Pacific region. We identify opportunities to leverage the Institute's global network to tackle regional challenges, as well as to integrate the region's perspectives into the development of solutions to persistent global challenges.

ABOUT ELEVANDI

Elevandi is set up by the Monetary Authority of Singapore to foster an open dialogue between the public and private sectors to advance FinTech in the digital economy. Elevandi works closely with governments, founders, investors, and corporate leaders to drive collaboration, education, and new sources of value at the industry and national levels. Elevandi's initiatives have convened over 300,000 people to drive the growth of FinTech through events, closed-door roundtables, investor programs, educational initiatives, and research. A flagship product is the Singapore FinTech Festival alongside fast-rising platforms, including the World FinTech Festival, Point Zero Forum, and the recently launched Elevandi Insights Forum.

In partnership with Elevandi

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Introduction

In a private roundtable co-hosted with Elevandi at the 2022 Singapore Fintech Festival, the Milken Institute gathered leading technologists, chief sustainability officers, large investors, and financial regulators for off-the-record discussions on green financing issues in the Asia Pacific (APAC) region. The plenary was co-moderated by Curtis Chin, chair of the Milken Institute Asia Center, and Darian McBain, PhD, advisor to the Monetary Authority of Singapore.

This roundtable is the third in a series the Milken Institute and Elevandi convened in 2022, with the first in July at the Point Zero Forum in Zürich and the second in September at the Milken Institute Asia Summit in Singapore. Through these convenings, the Institute hopes to help smooth and support the catalytic role of finance and technology in shifting businesses, regulators, and societies toward a more sustainable future.

Climate Leadership: Regardless of Sector or Size

Central to this roundtable discussion was a spirited debate on climate leadership. Participants were mainly split into two camps on the parties they believed were best placed to make a game-changing difference in green financing: asset owners or regulators. That said, there was broad agreement that all parties can make meaningful contributions to green initiatives worldwide, regardless of their financial clout.

Asset Owners Should Lead

Some argued for asset owners[1] to step up and exercise their influence on asset managers, noting that the massive amounts of capital they bring to bear are game-changing for climate action in the private sector and simply too large to ignore. For instance, a participant observed that the Government Pension Investment Fund of Japan has been instrumental in driving change among asset managers and consequently, the businesses the latter invest in. Similarly, to predict long-term reductions in a company's carbon intensity, UBS assesses whether the company is mostly owned by long-term investors who are concerned about the environment rather than the company's green statements.[2] Driving home this point is the fact that in every Milken Institute private session at the Asia Summit, any calls for carbon taxes have invariably come from business leaders or investors, not regulators.

What gives hope is that getting asset owners to prioritize green is less and less dependent on the moral epiphanies of executives. Participants noted that their own employees are increasingly vocal on climate issues, and to attract and retain talent, management must meet these demands. Other global surveys have found that 96 percent of employees expect their company to pursue a sustainability agenda, and employee and investor pressures were the number-two driver in this area (after customer demand).[3]

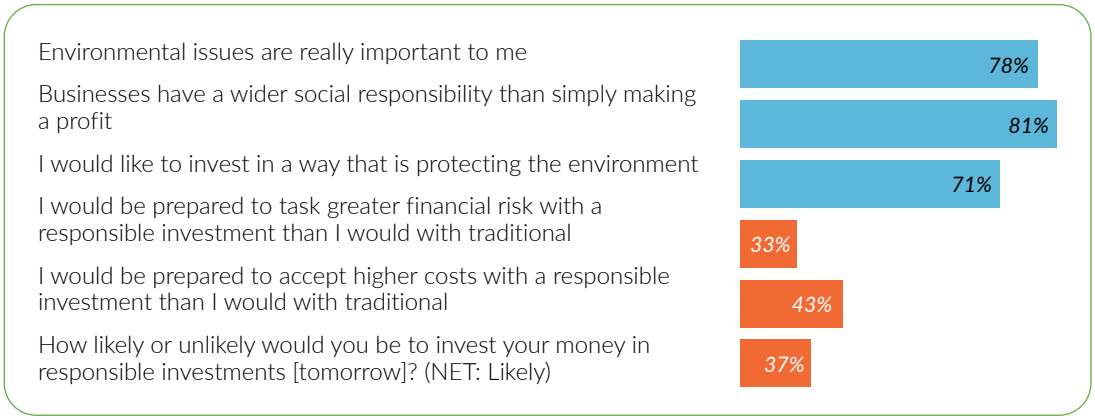
Conversely, these participants believed that regulatory action, while helpful, would be stonewalled on multiple fronts. First, public support for green initiatives does not always translate into a political mandate for regulators to act. This could be due to consumers' unwillingness to pay more or politicians' reluctance to cede competitive advantages to rival countries. Second, deep-pocketed lobbies can delay and water down green efforts. Third was the notion that regulatory updates move at a glacial pace, and efforts to standardize regulations internationally, and still keep them substantial, will take too long. With the urgency of climate action growing day by day, all who can play a decisive role should do so immediately.

Regulators Should Lead

Other participants believed that a true movement toward sustainability necessitates long-lasting and systemic sacrifices in production and consumption. But the incentives for investors, businesses, and consumers are weak for two main reasons. First, not all that is green is profitable—sometimes not even in the long term. For this reason, reliance on markets alone will leave unprofitable but important initiatives in the lurch.

Moreover, greenwashing and virtue signaling are rife, cheap, and fast. This can mislead investors and misallocate funding in the short term, but the real danger lies in breeding complacency, mistrust, shirking, and procrastination. In some surveys, although four in five consumers indicated that environmental issues were important to them, and they believed that businesses have a wider social responsibility, only around a third were personally willing to accept higher risks or costs, or start investing responsibly with immediate effect (Figure 1).[4]

Figure 1: Poor Incentives Produce Inadequate Action



Source: UK Financial Conduct Authority (2020)

"My concern is that if the titans of business and finance are telling people they can have their cake and eat it too, people are not going to give away their cake."

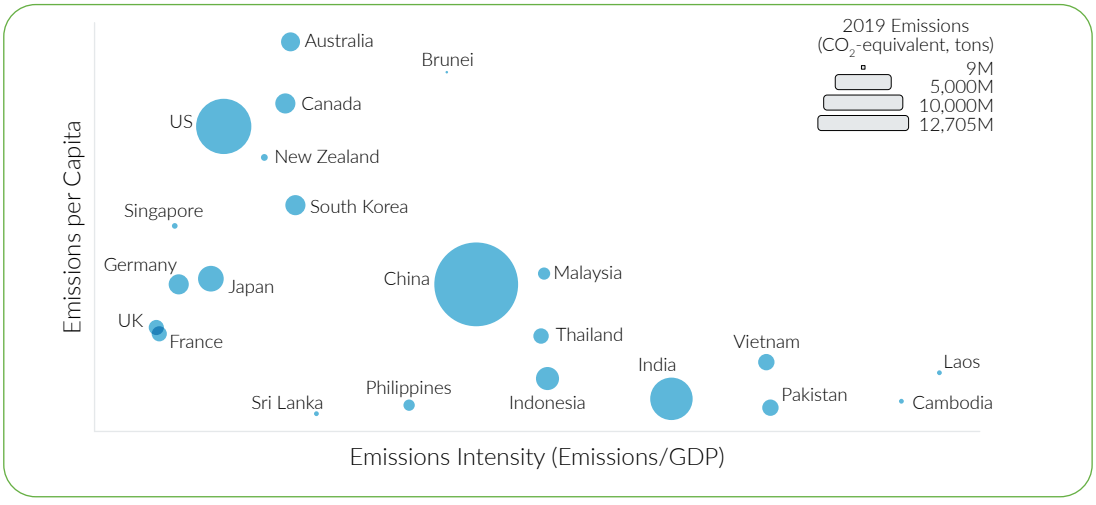
These participants noted that although some big companies have taken the lead in green, it is wishful thinking to believe this is sufficient or that everyone else will follow suit. With a net zero transition requiring systemic change and sacrifice by all parties, speed and success are defined by the laggards, not the leaders. In this light, regulation is the only instrument that can realign incentives throughout the whole of society in a timely manner.

Size versus Impact

Inherent in the challenges faced by both camps is the free rider problem and the subtle notion that only large players can drive real impact. This holds true in some ways. Participants recalled that in many of their exchanges, companies and regulators alike have stated that unless the largest polluters and markets make substantive commitments, efforts by smaller players will mean little.

On regulatory action, one participant argued that the US should be taking the lead not just because of its massive emissions (Figure 2) but because it has financial muscle unlike any other to corral other developed countries into collective action. In parallel, micro-, small-, and medium-sized enterprises (MSMEs); stock exchanges; and regulators alike have privately expressed that they cannot be overly ahead of the curve in green, as their clients or constituents would simply move to a competitor. In these senses, green efforts worldwide are inextricably tethered to the commitments of the largest players.

Figure 2: Scale of Greenhouse Gas Emissions



Source: Milken Institute analysis of World Bank DataBank (2022)

This is not to say that the rest of the world should wait for the grass to turn greener. One participant spoke of impending requirements for companies to be allowed to display green labels, as well as of plans to mandate timely vote disclosure for asset owners and regulate the environmental, social, and governance (ESG) ratings market. Others noted that the G20 and Asia-Pacific Economic Cooperation multilateral meetings were all taking place in Southeast Asia in 2022 and wondered if smaller blocs of countries, such as the Association of Southeast Asian Nations, could provide a neutral platform to convene large powers.

For instance, multiple (non-Singaporean) participants noted the leading role Singapore plays in the intersection of green finance and technology, be it governmental efforts to standardize ESG metrics at multilateral forums, regulators' willingness to foster technological development,[5] or ongoing private initiatives to develop a science-backed transition taxonomy. The private sector also has many unique ways to contribute; one participant suggested that the finance industry could help mitigate climate-unfriendly lobbying.

Other participants specified that smaller or emerging markets could pilot their own initiatives so that larger or developed countries could learn from their experiences and adopt them quickly. For example, although many have called for disclosures to be oriented toward impact rather than risk assessment, adoption has been slow due partly to inadequate know-how. In turn, any learnings on impact-oriented disclosures, wherever based, could be helpful to the rest of the world. The same applies to efforts to transition polluting assets toward cleaner production.

> **"Seventy percent of energy demand between now and 2050 will come from Asia. We need not only low-carbon investing but transitional investing because we'll exceed 1.5˚C even if we go entirely green today."**

Relatedly, a common complaint is that regulations in ESG issues fail to account for the difficulties faced by emerging markets. But only by getting an internal head start can emerging markets acquire useful learnings to share with the developed world. On that front, two recent developments are worth highlighting.

First is the Just Energy Transition Partnership in Indonesia, which will mobilize US$20 billion of funding from developed countries and private investors over the next three to five years.[6] Indonesia has, in turn, pledged to peak its emissions by 2030, seven years earlier than before, and discussions on a similar blended-finance arrangement are in progress for Vietnam.

Second, the Securities and Exchange Board of India has mandated that the top 1,000 companies disclose more than 120 metrics on ESG from FY2023 onwards.[7] Observers have noted that this will reduce greenwashing and opacity while improving standardization but cautioned that mindsets and know-how would take time to develop.

This speaks to the integral role of finance and technology in uplifting sustainability programs worldwide, turning the discussion toward technologies that facilitate such developments.

Technology: Ledger, Enabler, and Self-Driver

Convenings in FinTech typically focus on why humans need technology, be it the benefits of transparency, connectivity, or efficiency. For instance, multiple participants felt that recent technological adoption had been driven by expectations of impending regulations and the need for technology in both compliance and enforcement. Implicit in these discussions is that a vast range of technologies already exist to solve a wide spectrum of problems (Figure 3 offers an example[8]).

Figure 3: Impact and Adoption of Sustainable Technologies

Impact on Existing Products and Services	Time to Early Majority Adoption		
	1 to 3 Years	3 to 6 Years	6 to 8 Years
Low		• Electric Vehicle Wireless Charging	• Net-Zero Agriculture
Medium		• Asset Optimization • Climate Risk Analytics • Geospatial Biodiversity Mapping • Motion Energy Harvesting • Smart City Apps	• Carbon Capture and Storage • Distance Wireless Charging • Drone-Based Biodiversity Monitoring • Hydrogen Fuel Cells • No-Net-Loss Biodiversity • Water Management
High	• Advanced Grid Management Software • Carbon Footprint Measurement • Cloud Sustainability	• Blockchain for Agriculture • Circular Economy • Light Energy Harvesting • Renewable Energy Generation • Sustainability by Design • Thermal Energy Harvesting	• Carbon Offset Platforms • Materials Informatics • Microgrids
Very High		• Environmental Sensors	

Note: The time to majority adoption is generally much later than for individual adoption, should a company want to secure an early advantage.

Source: Reference 8, Gartner (2022)

More important to participants was how technology relies on humans, whether it be redesigning systems and processes in which technology can flourish, creating positive loops that iteratively improve digital solutions, or standing by innovation and innovators through economic hardships. In particular, participants noted that sustainability journeys and the commercialization of new technologies would span several decades. They thus emphasized the need for optimism and comfort with uncertainty, to invest early and proactively in innovation rather than be compelled at the last minute by technologically superior competitors.

One participant even posited that technology itself is the reason to go green: As devices and machine learning all around progressively capture and sift every individual's words and

actions, future generations will increasingly be able to pinpoint those who fought for the planet and those who failed it. Knowing that one's legacy may be laid bare for all to judge in the future, it could very well be in the self-interest of individuals, corporations, and governments to get started on sustainability today.

In fact, some governments are already beginning to empower local communities in technological monitoring. In November 2022, the US unveiled proposals for a "Super-Emitter Corrective Action Program," empowering government-approved third parties to help monitor major methane leakages using technology.[9] On detection, these private organizations can directly serve notices to the companies responsible, triggering federal requirements for corrective action—in some cases, within 10 days. The US is further funding the UN's Methane Alert and Response System, which will leverage satellite networks to detect methane plumes worldwide and identify the companies or governments responsible. In both cases, leaks, notices, and the emitters' responses will all be made public.[10]

Creating Positive Loops

A common thread in discussions was the importance of creating positive feedback loops. Participants across sectors had many diverse examples of how these could be initiated. For instance, while nascent technologies typically provide solutions to narrow problems, collaboration between startups and businesses can improve product design, interoperability, and adoption, which subsequently enables greater collaborations, repeating the virtuous cycle.

> **"We'd love to do secondees between the finance and tech sides so that you can immediately call 'BS' if our product managers build something that's not useful."**

One participant even spoke of the role technology plays in preserving institutional memory: As sustainability journeys will span the tenure of multiple chief executive and sustainability officers, a corporation's technology stack plays the role of preserving historical data, along with the successes and failures of previous sustainability initiatives a company has experimented with.

Other participants spoke of the positive loops in ESG data reporting and registries. For instance, the Singapore Exchange consulted with financial institutions and filtered down to 27 sustainability metrics for listed companies to report.[11] These metrics are directly useful to financial institutions and are also framework-agnostic, which means they can be adjusted should global consensus on a reporting framework solidify or change in the future. In parallel, companies that do well in ESG could feel incentivized to report their strong performance on ESG registries, from which their data could be used as case studies for other companies and financial institutions.

Participants further envisioned some possibilities for the future. For instance, if map providers listed the ESG ratings of all food and beverage or retail outlets, it would help climate-conscious consumers decide where to eat or shop. In turn, banks with access

to those data could design green credit cards that better reward spending at these greener establishments, reinforcing greener uptake among consumers. Another possibility was for buildings emissions data to be shared with banks, after which banks would issue green loans to tenants. Tenants would then be incentivized to locate in green buildings, gradually signaling to the broader market that all buildings should be green.

Democratizing Sustainability

Inherent in the success of positive loops is the need to engage the broader public and business community—the earlier, the better. Participants each had their own ideas to address challenges raised around the room.

A common challenge is that MSMEs lack the resources to report ESG data, even if it involves "only" 27 metrics. This issue is all the more important in Southeast Asia, where 97 percent of businesses are MSMEs, accounting for two-thirds of employment.[12] One participant acknowledged that the number of reporting metrics could be further reduced for MSMEs but stressed the importance of getting them started on reporting as well. Others added that there was no need to have MSMEs report their Scope 3 emissions, as they have minimal influence on the actions of their suppliers and customers.

Another participant highlighted that ESG data are not just data reported by public companies but any data that can help scale renewable financing, whether open-sourced or proprietary. The participant noted that for banks to finance projects in renewable energy, the need to commission multiple consultants for curtailment risk, resourcing assessment, and a bevy of other requirements ultimately means that ticket sizes need to be at least $10 million to be worthwhile. Unfortunately, this excludes the vast majority of renewable projects, which are typically 10 to 100 times smaller.

The participant believed that if financial institutions could share data with one another and lower the costs of assessment, they could unlock financing for many more green initiatives around the region. Another participant is exploring the use of machine learning and other technologies to package financing for smaller transactions: for instance, tokenizing a portion of financing and distributing it widely.

That said, participants pointed out that, ultimately, trust is the bedrock of broad engagement with governments, businesses, and the public. One participant observed with concern the growing distrust governments hold against technology companies, stressing that environmental challenges should not be politicized, and regulators should keep an open mind to technological innovations.

> **"Everybody can come up with technology. It's whether governments can trust and empower technology companies to solve problems."**

Another emphasized the value of simplicity for digital solutions to help establish trust, noting that the alphabet soup of disclosure standards, the lack of consensus in impact measurement, and the complexity of social issues already make sustainability efforts difficult enough, and there is no need for technology to complicate matters further.

Impact and Introspection

Multiple participants noted that much technology and data are available today, but not all make a demonstrable impact. A central contention is that sustainability initiatives are multi-decade efforts, and many initiatives will only be implemented in the future. This raises questions as to how companies are to be assessed on sustainability today based on actions yet to be taken.

One participant called for data to be more contestable, arguing that shedding light on derivation and aggregation methodologies will give users greater confidence in using those data to shape long-term sustainability strategies. This also includes being clear about the kinds of data that are available in ESG data repositories under development and granting access as early as possible.

Other participants remarked that the sheer quantity of data being produced may indicate the need for greater streamlining and coordination. Some felt that the data that companies provide do not necessarily match what regulators want (or what companies say they are targeting, for that matter). Others cautioned that the quantity or quality of data collected is not a substitute for underlying capabilities in achieving net zero, and if requirements to label companies as "green" are overly stringent, it could sharply reduce the number of viable companies in the green investing space. This could ultimately reduce diversification in green portfolios, dissuading investors from investing in green to begin with. It would also extract a heavy toll on companies, some of which are already complying with multiple frameworks just to be comprehensive. The priority, some participants believed, is first to standardize disclosures and get everyone on board.

While it was unsurprising that a discussion at the Singapore FinTech Festival looked very favorably upon technology, a participant reminded the room that technology has its own emissions. For instance, training one large machine learning model in natural language processing can produce emissions of magnitudes similar to a flight between New York and San Francisco (Figure 4). Worse, other researchers have found that model fine-tuning and downstream model usage each can generate much greater emissions than training.[13] Regarding technological hardware, the disposal of electronic waste can also cause great environmental damage.

Figure 4: Emissions from Machine Learning Models (CO_2-Equivalent Kilograms)

Model	Emissions
ELMo	119
BERT (Base)	652
NAS	284,019

For Comparison	Emissions
Air travel, 1 passenger (NY to SF)	900
Human life, 1 year	5,000
Car (including fuel), 1 lifetime	57,153

Source: Reference 13, Strubell et al. (2019)

Thus, although leading technology companies may have already achieved net zero emissions, as with every industry, there is a need to bring everyone else along the path to sustainability. For instance, the aforementioned researchers recommended training models on the cloud and choosing data centers that run on clean energy, as such measures could reduce emissions by a factor of 100. They also called for data center providers to publish their power usage and energy sources per location, to allow technologists an informed choice.

Finally, an uncertainty lingering in participants' minds was that impact takes a long time to materialize and be measured. As such, it is not entirely clear whether the dearth of positive green outcomes to date is mostly due to inaction, or initiatives simply have not run their course. Participants stressed the need to be optimistic but not complacent—engaging as many as possible to go greener and getting started with the technologies available today.

Endnotes

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About the Author

Quintus Lim is an associate director of policy and programs at the Milken Institute Asia Center. He focuses on policy areas such as R&D financing and technological adoption across domains such as health, food, and agriculture, as well as issues of ecosystem building. Lim holds a bachelor's degree in government and economics from the London School of Economics and is pursuing a master's degree in analytics at the Georgia Institute of Technology.

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