



Towards a Sustainable Future

Summary Report



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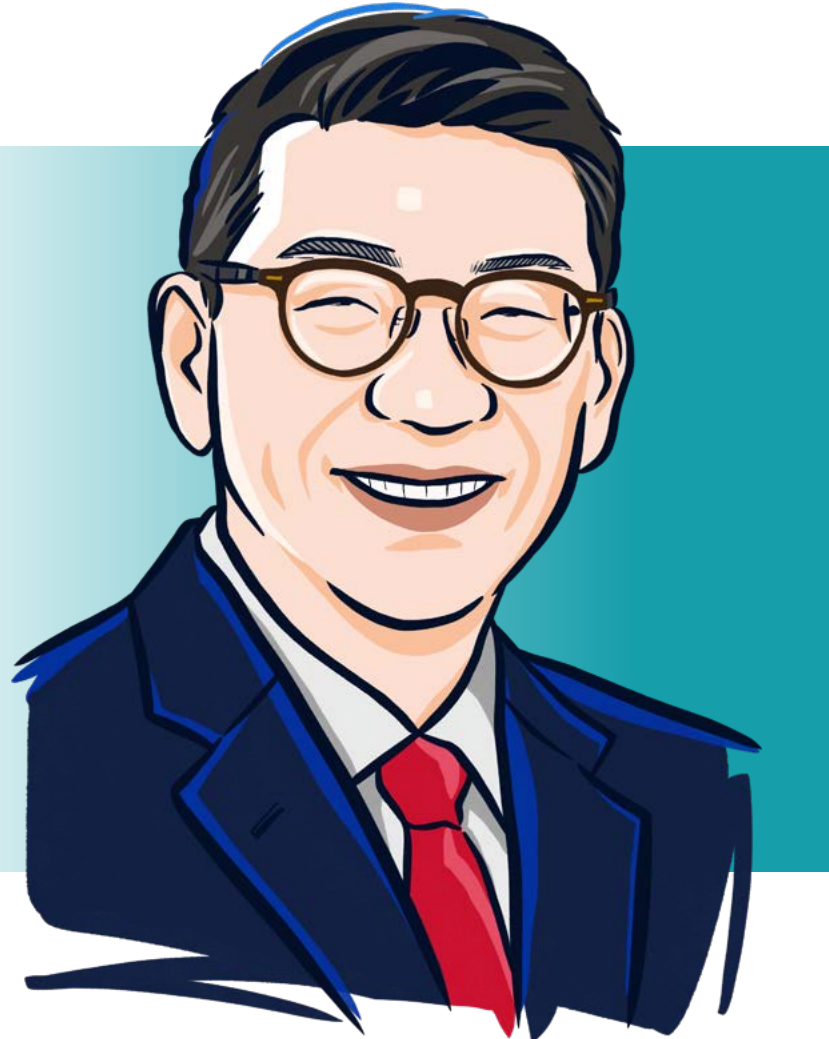
Established in 2016, **GIC Insights** is GIC's annual thought leadership event that gathers a select group of prominent leaders from key partners, investee companies and counterparties to discuss long-term issues pertinent to the international business and investment community.

Towards a Sustainable Future

The global shift towards sustainability has strengthened with the Covid crisis, and is transforming policies, businesses and capital markets. Although as a disruptive force, climate change, social inequality and other sustainability risks might have negative implications for longer-term performance, they also bring about opportunities for change and innovation. This is taking place across many sectors, including energy and healthcare which are regarded as being an enabler of as well as a challenge to sustainable development.

At GIC Insights 2021, we seek perspectives from global thought leaders on how various stakeholders are responding to this evolving landscape, and what initiatives and investments are needed to build a more resilient and sustainable future.

Opening Remarks



Lim Chow Kiat
CEO, GIC

A very warm welcome to GIC Insights!

The value of this forum comes in large part from the network effect. Your individual participation, in-person or online, add disproportionately to that effect. This is platform investing – the value expands and compounds exponentially even without adding more capital.

This compounding effect happens over time too. Albert Einstein reportedly called this “the most powerful force in the universe”. It fits right into how GIC invests – finding and holding assets with quality earnings to compound over the long term.

- These assets include our long partnerships with many of you. Your ideas, capabilities and giving us first calls on good co-investments are a big part of this compounding effect.
- I hope you would agree that we too contribute to your compounding, by providing you with good capital, professional reputation, speedy execution, fair terms, and a global network like what you see today. The compounding goes both ways.

THE VALUE OF THE NETWORK AND COMPOUNDING EFFECT!

FROM YOU

LONG PARTNERSHIPS,
IDEAS, CAPABILITIES,
FIRST CALLS ON GOOD
CO-INVESTMENTS

FROM US

CAPITAL, PROFESSIONAL
REPUTATION, SPEEDY
EXECUTION, FAIR TERMS,
GLOBAL NETWORK



At this forum, we will explore how we can use this universal compounding force to move **“Towards a Sustainable Future”**, the theme of this forum. Our distinguished speakers will share their insights with us on several topics.

- On a **low-carbon economy**, we will explore planetary challenges and solutions.
- On **healthcare**, we will get ideas on better care and affordability.
- On **economies and policy**, we will better understand if we are finally facing the trade-offs between growth and inflation.

In the next few minutes, let me talk briefly about what GIC is doing in terms of sustainability, using climate change as an example.

Climate risk is something we cannot diversify or divest away. It is an existential threat, a universal risk cutting across every asset class, and there is not enough capacity in green assets to find refuge in or address the problem. Divesting to pass on the problem to others is not a good solution. So instead, we embrace the transition, which means helping companies reduce their carbon emissions and deal with climate risks.



“Climate risk...is an existential threat, a universal risk cutting across every asset class, and there is not enough capacity in green assets to find refuge in or address the problem.”

As we do so, we have found these three needs:

First, we need good data, including taxonomy and disclosure standards.

- Getting data which is relevant, material, reliable and comparable is important to measure, benchmark, assess and track transition progress. Big advancements had been made by institutions such as the Carbon Disclosure Project (CDP) to collect carbon emissions data from companies, and the Taskforce on Climate-related Financial Disclosures (TCFD) with its emphasis on forward-looking scenario analysis.
- More recently at COP26, with the launch of the International Sustainability Standards Board (ISSB) we finally have a quicker way to get connectivity and compatibility between accounting and sustainability disclosure standards.
- In addition, there are also attempts at using new technologies such as artificial intelligence to help with surveillance. Things are looking up.

Second, we need good engagement with companies.

- During the transition, there are often inherent conflicts amongst the “E, S, and G”. This is especially so in developing countries where the transition need is the biggest and yet the resource constraint is the most severe.
- For example, cancelling a fossil fuel project, which could be the main source of livelihood for a local community, could be positive for the environment, but could indirectly reduce access to jobs, healthcare or education and even women’s rights. Or it may show up in the form of energy shortage, as seen currently.
- Good engagement comes from having a strong understanding of the bottom-up fundamentals and providing the means for an effective and practical transition.

Third, we need good governance.

- As is often said, there is money ready to be deployed, in trillions. But what is lacking are investment vehicles and structures which align with and protect the interests of all stakeholders.
- Much like in public infrastructure, the reliability of regulations and governance standards varies across countries. It explains the persistent gap between supply and demand of capital in that space. Adding sustainability considerations makes it more complex, especially as more stakeholders are involved.
- We need more efforts and examples, including projects de-risked by governments and multilateral development agencies, credible surveillance of sustainability progress, and clear protection of legal rights.

We consider these needs as difficult tasks to tackle, rather than some insurmountable problems.

3 AREAS OF NEEDS:

1 GOOD DATA



2 GOOD ENGAGEMENT WITH COMPANIES



3 GOOD GOVERNANCE



How is GIC tackling them?

On the first task of getting good data, we contribute ideas and investor perspectives to the efforts of various standard-setting organisations.

- For example, we participated in the World Economic Forum (WEF)’s initiative to develop a harmonised set of ESG metrics, and in the Singapore Green Finance Industry Taskforce’s work to develop a green taxonomy for Singapore-based financial institutions.
- In addition, we continue to contribute data, either directly by collecting emissions data for our real estate assets, or indirectly by collaborating with our fund managers on disclosures. Last year, we signed on to the CDP’s letter to over 3,500 listed companies in our public equities portfolio to improve environmental disclosures consistent with TCFD’s recommendations. When data is available, as investors, we are then able to integrate them and better account for transition-related risks and opportunities in the investment process.

- For instance, when carbon emissions data became more standardised a few years back, we were able to create an internal carbon dashboard to compare the carbon intensity of companies and conduct more granular carbon price stress tests.

On the second task of transition engagement, we have in place both top-down and bottom-up efforts.

- We have found it particularly important to do the bottom-up work well; to engage our portfolio companies sub-sector by sub-sector, and company by company. Each faces different challenges, dilemmas and timelines. An overly top-down push may risk a counterproductive outcome, including bluntly divesting to meet emission targets.
- In our bottom-up work, for instance, we found an opportunity to contribute development capital to repurpose legacy assets, turning pipelines for transporting natural gas into pipelines for carbon capture and hydrogen. Such repurposing greatly saves time over building new infrastructure.

- We work with fellow investors too. This year, together with 12 members of the Asia Investor Group on Climate Change (AIGCC), we launched the Asian Utilities Engagement Program to engage with utility companies in Asia. This is an important effort as Asian utilities are responsible for 23% of the world’s total carbon emissions.¹

- Finally, several of our investee companies are moving fast ahead. Our pure play renewable company in India, Greenko, has gone beyond provision of “standard” renewable energy to the grid to helping customers to decarbonise. In the Philippines, we are excited to be working with AC Energy to transition its portfolio to being coal-free by 2030.

On the third task of designing investment vehicles with good governance, we have faced more difficulties. Nevertheless, we do have some examples of success:

- First is our US\$2 billion investment in Duke Energy Indiana, where the governance and legal frameworks in the State of Indiana give investors a

clear and proven mechanism for investing in new energy sources. Through additional investments, we do not only turn a business “green”, but also earn a fair return on our invested capital.

- Next are our investments in new technologies such as geothermal energy, carbon capture and sustainable farming. With appropriate government support and research institution collaboration, we are finding more new solutions which are promising.
- We have also started to participate in carbon trading in the compliance markets to prepare for the all-important market-based solution. We need a good governance system to price externalities and carbon markets provide a way to do that. Carbon trading must, however, not divert efforts from cutting carbon emissions at source, and should contribute to the overarching goal of a low-carbon future.

Conclusion

Ladies and gentlemen, we must transition to a low-carbon economy. There is no other way. We cannot diversify nor divest away climate risk. We must embrace the transition. We have some difficult tasks at hand, including those of data, engagement and governance. But we can tackle them methodically.

We can tackle them with confidence, drawing inspiration from the speedy advent of Covid vaccines. What was supposed to take 10 to 15 years was done in less than

a year.² That changed the course of the pandemic and along the way produced some big investment returns.

We will also count on the universal compounding force of partnerships with you, so let us find more opportunities to work together.

I hope you find the sessions and takeaways from GIC Insights 2021 useful.

Lim Chow Kiat
CEO, GIC

1. AIGCC (2021). *New investor-led engagement program launched to drive net zero emissions transition in Asian electric utilities.*

2. National Geographic (October 2021). *Here's the latest on Covid-19 vaccines.*

A Sustainable Future for *Capital*

This chapter summarises a keynote session with Michael R. Bloomberg, Founder, Bloomberg L.P. and Bloomberg Philanthropies, and three-term Mayor of New York City. The conversation focused on mobilising capital to deal with climate change and other key issues like public health, and was moderated by Lim Chow Kiat, CEO of GIC.



Michael R. Bloomberg

Founder, Bloomberg L.P. and
Bloomberg Philanthropies
Three-term Mayor of New York City

Climate change and capital

Climate change has become an issue at the top of the global agenda for governments and companies. More and more companies incorporate Environmental, Social, and Governance (ESG) criteria into their strategies and business practices. Investors increasingly consider both returns and ESG outcomes in their decision-making processes, and are taking into account ESG concerns even when it comes to hiring decisions or potential media coverage.

Recent events like the United Nations Climate Change Conference (COP26) in Scotland have emphasised the need to take urgent climate action. The vast majority of global GDP is now covered by a commitment to reach net zero emissions. But while commitments are a positive sign, they are merely a first step that must lead to action.

Financing the global transition to clean energy will cost trillions of dollars in new investments and much will have to come from the private sector, particularly after the devastating effect that the pandemic has had on public

budgets. While these new investments will be an enormous opportunity that will see new companies formed to deal with the impact of climate change, whether they will be able to successfully stop runaway climate change is uncertain. Speeding up the rate of investments in the private sector to aid these efforts will be crucial.

Efforts like the Climate Finance Leadership Initiative (CFLI)³ have been created to drive more capital to sustainable infrastructure in emerging markets. GIC is one of our partners in CFLI. Our foundation is also working with other countries, for example, Indonesia, which has the potential to be one of the world’s leaders in solar power. We are helping them with public-private financing tools that reduce upfront risks and with developing business models for financing solar power at airports and other public facilities.

Other initiatives like the Glasgow Financial Alliance for Net Zero (GFANZ)⁴ that was created in the lead up to COP26 have also helped to galvanise commitments from the private sector. The alliance currently comprises 450 firms managing around US\$130 trillion of assets

and will provide transparency and accountability to make sure that members back up their words with actions. These include providing clear standards about what counts towards net zero. Clearly defining the key terms will help to coordinate firms and ensure that they use the same metrics, thereby making their efforts more effective.

To deal with climate change, companies aim to reduce their exposure to risks when investing, while embracing opportunities from the low-carbon transition. However, they often lack the data to be able to effectively allocate capital. Industry-led efforts to fill that gap include the Taskforce on Climate-Related Financial Disclosures (TCFD),⁵ which has created a set of recommendations to help countries measure the financial risks and opportunities arising from climate change. A growing number of businesses, governments and financial institutions have endorsed the recommendations, including the G20 countries. That is an important step towards making TCFD a global standard which will allow for a more objective comparison of ESG disclosures across industries and countries, and facilitate an increased flow of sustainable investments.



“The vast majority of global GDP is now covered by a commitment to reach net zero emissions. But while commitments are a positive sign, they are merely a first step that must lead to action.”

COMMITMENTS



* NEW INVESTMENT IN ENERGY TRANSITION TO COME MAINLY FROM PRIVATE SECTOR

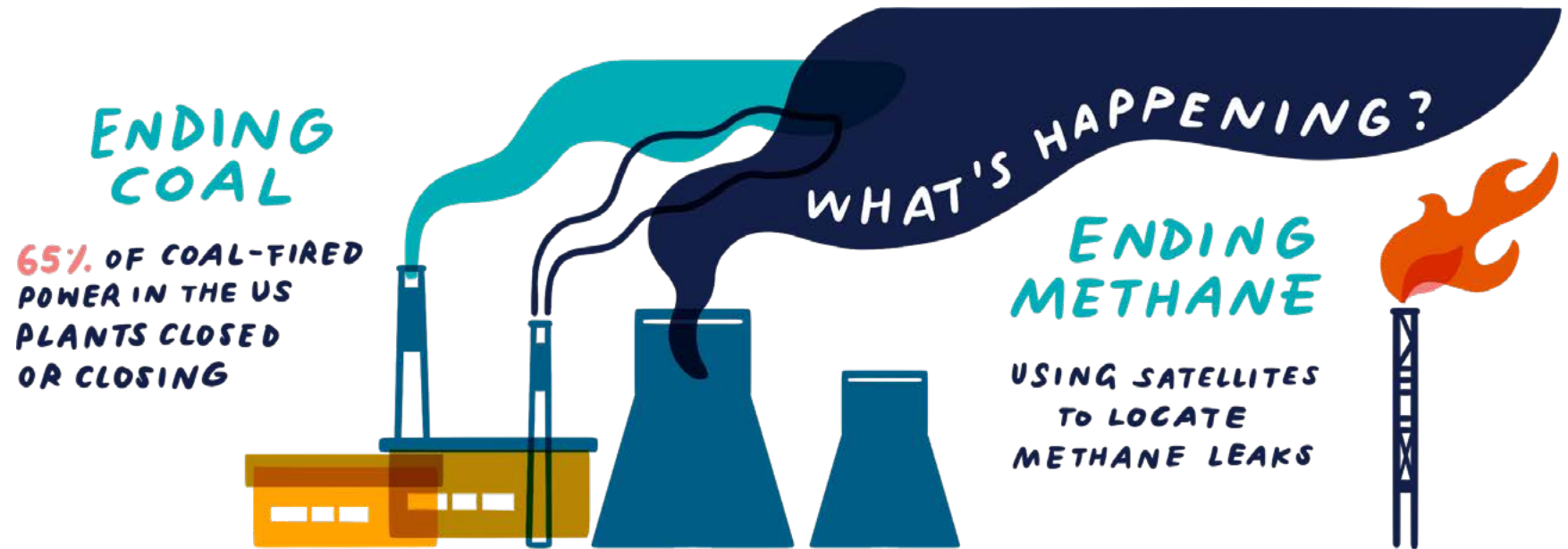
CURRENT EFFORTS

- 1 CLIMATE FINANCE LEADERSHIP INITIATIVE
DRIVE CAPITAL TOWARDS EMERGING MARKETS
- 2 GLASGOW FINANCIAL ALLIANCE FOR NET ZERO
PROVIDE TRANSPARENCY AND ACCOUNTABILITY
- 3 TASKFORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES
MEASURE CLIMATE-RELATED RISKS AND OPPORTUNITIES

Focusing on coal and methane

For investors, there is mounting pressure from all parties including clients, shareholders, and employees to pay closer attention to climate change and to alter their investment approach accordingly. This can come in the form of pressure on firms to change their policies, including retiring coal-fired power plants or making products more compliant with a science-based approach to climate action. In the US, about 65% of coal-fired power plants have either closed down or are in the process of closing.⁶

With methane, another key source of emissions, capital can also play a part. While methane breaks down more quickly compared to carbon dioxide, it is also emitted at a very rapid rate and is much worse in terms of its climate change impact and global warming potential. In addition, there could be leakages from old coal mines, gas and oil wells, and even melting tundra. Fortunately, we are now able to fund satellites at a reasonable cost to track the location of methane leaks. That information can then be relayed to governments accordingly, but it is also up to us to help galvanise governments into action.



ENDING COAL

65% OF COAL-FIRED POWER IN THE US PLANTS CLOSED OR CLOSING

WHAT'S HAPPENING?

ENDING METHANE

USING SATELLITES TO LOCATE METHANE LEAKS



Focusing on cities

When combating climate change and other issues, a focus on cities is important because it is where most people live and consume energy. That energy consumption is what drives the activity of power plants, which may or may not be using carbon-intensive means of production. By reducing energy consumption in cities, it would go a long way to reducing pollution overall. Additionally, cities are also where the vast majority of the voting population resides. Any public pressure campaign to lobby governments to take action would also therefore need to take cities and their populations into account.

Focusing on public health

In the 12 years that I was in office in New York City, life expectancy not only went up by three years, it was also three years higher than the national average. One key driver of success was reducing air pollution along the main city roads where many children live, often getting sick because of the polluted air they used to breathe in. We also implemented the Smoke-Free Air Act in 2003, which banned smoking in virtually all workplaces in the city, so as to prohibit exposure to second-hand smoke in areas such as bars and restaurants.



Focusing on action

Deploying funding at a pace needed to avoid the worst impacts of climate change is an enormous task which can only be achieved if we work together.

3. The Climate Finance Leadership Initiative (CFLI) was created in January 2019 to increase private sector investment in clean energy and climate solutions in emerging markets. Bloomberg (2021). [Climate Finance Leadership Initiative](#).
4. The Glasgow Financial Alliance for Net Zero was launched in April 2021 and aims to bring together existing and new net-zero finance initiatives in one sector-wide coalition. It also provides a forum for leading financial institutions to accelerate the transition to a net zero global economy. Glasgow Financial Alliance for Net Zero (2021). [About Us](#).
5. The Task Force on Climate-Related Financial Disclosures (TCFD) released their recommendations in 2017 to help companies better provide information to support informed capital allocation. The recommendations are structured around four thematic areas that represent core elements of how organisations operate: governance, strategy, risk management, and metrics and targets. Task Force On Climate-Related Financial Disclosures (2021). [About](#).
6. Bloomberg (2021). [Michael R. Bloomberg Announces New Effort To Close A Quarter Of the World's Remaining Coal Plants And Cancel All Proposed Coal Plants Globally by 2025](#).

A Sustainable Future for *Healthcare*

This chapter summarises the panel discussion by Jean Hynes, CEO of Wellington Management; Robert Nelsen, Co-founder and Managing Partner of ARCH Venture Partners; and Bill Anderson, CEO of Roche Pharmaceuticals.

Moderated by Doreen Chia, Managing Director and Chair of GIC's Healthcare Business Group, the panel spoke about the lessons learnt from Covid-19 that could enable better preparedness for future pandemics, and how innovation could be used to help sustain healthcare systems over the long term.

Doreen Chia

Managing Director and Chair of Healthcare Business Group, GIC

Robert Nelsen

Co-founder and Managing Partner, ARCH Venture Partners



Jean Hynes

CEO, Wellington Management

Bill Anderson

CEO, Roche Pharmaceuticals

Dealing with future pandemics

One key positive outcome arising from the Covid-19 crisis was the seamless collaboration between the private and public sectors on the research and development of diagnostics, vaccines and therapeutics. This has resulted in the unprecedented global roll-out of several powerful vaccines in less than a year, a process which typically takes 10 years. Being able to apply a similar approach to future pandemics or even areas like oncology could lead to the development of other significant medical solutions.

Other lessons discussed by the panel included the need to invest more in the domestic production of medical products and their supply chains. Governments need to proactively prepare for the inevitable next pandemic, as future outbreaks could stem from unexpected sources and be even more devastating.

KEY LEARNINGS FROM THE PANDEMIC

- * VITAL ROLE OF PRIVATE AND PUBLIC COLLABORATION IN THE RAPID ROLL-OUT OF VACCINES ; POTENTIAL FOR OTHER MEDICAL SOLUTIONS
- * INCREASE RESILIENCE IN SUPPLY CHAINS AND PRODUCTION OF KEY MEDICAL PRODUCTS
- * PROACTIVELY PREPARE FOR FUTURE PANDEMICS

Innovation in the healthcare industry

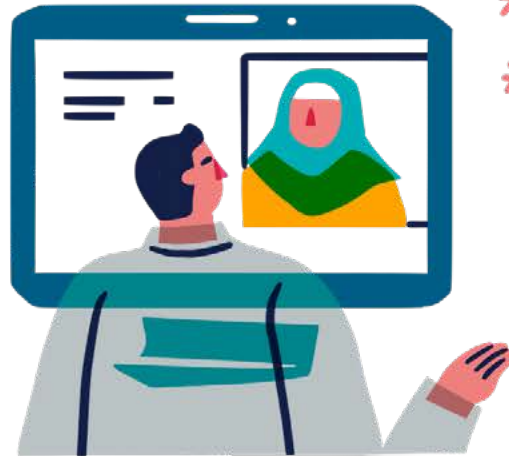
The panel observed that the healthcare industry was going through an exciting period of rapid innovation and change. There are now many more private companies relative to public companies. Previously, to be a successful investor in biotech, one needed to have knowledge of at least 15 changing areas of medicine, but this has now increased to 50 to 60. While there is significant competition with more capital targeting the sector, there are also a lot more opportunities.

Before the 1990s, there were only small-molecule drugs like Aspirin or Advil. The birth of the biotech industry in the 1990s led to the development of protein drugs and monoclonal antibodies. And in this decade, new treatment modalities have emerged including cell

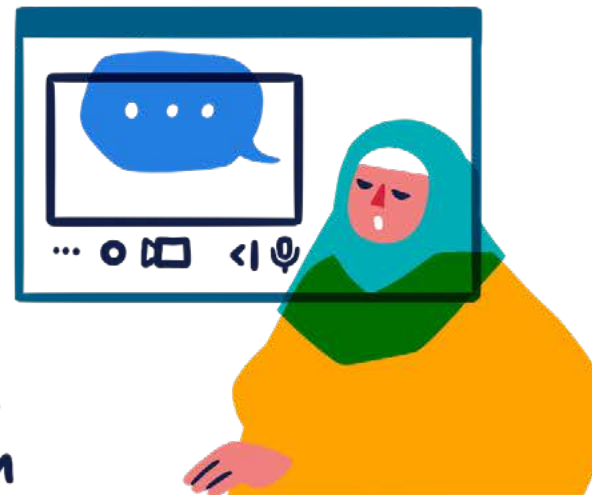
therapy, gene therapy, gene-editing, siRNA (small interfering ribonucleic acid) and mRNA (messenger RNA). The panel was hopeful that a lot of biological problems could be solved in the coming years meaning more advances for patients. Also, because these new modalities are less easy to genericise than

small molecules, the industry's revenue streams are likely to be more durable over the next 10 or 15 years. Another area of investor interest is the science of anti-aging including cellular rejuvenation and epigenetic reprogramming.

DATA + TECHNOLOGY



- * REDUCE WASTE IN HEALTHCARE SYSTEMS
- * SHIFT FROM VOLUME-BASED TO OUTCOME-BASED HEALTHCARE
- * TELEMEDICINE FOR MORE OPTIMAL CARE
- * EARLY DIAGNOSES AND PREVENTATIVE CARE
- * DEVELOP HEALTHCARE ECOSYSTEMS FOR THE LONG TERM



“There is a need to invest more in the domestic production of medical products and their supply chains. Governments need to proactively prepare for the inevitable next pandemic, as future outbreaks could stem from unexpected sources and be even more devastating.”

New care models that are more sustainable

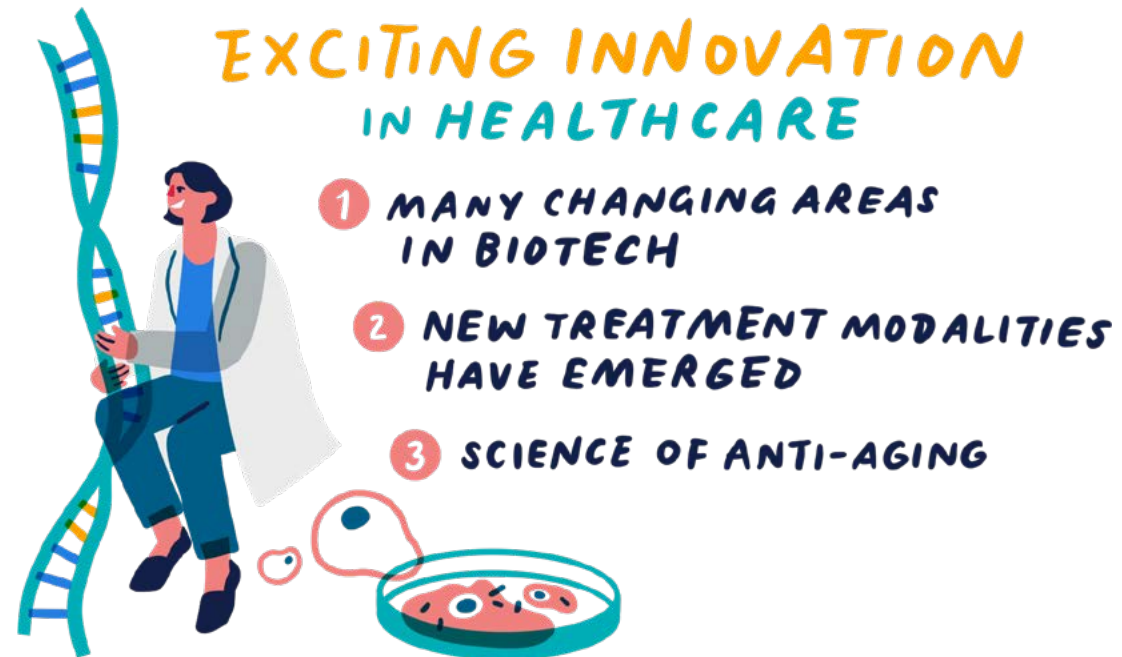
The panel was optimistic that data and technology would help reduce waste in healthcare systems and make healthcare more affordable and sustainable for the long-term. Technology is facilitating a shift from paying for volume-based care to paying for outcomes. With electronic medical records, the ability to mine databases of real-world evidence of medicines and machine learning, it is now possible to assess which patients are most or least likely to benefit from specific drugs, and prescribe accordingly. Telemedicine enables a more optimal use of patient and physician time.

Technology also holds the promise of early diagnoses and preventative care, which could pre-empt costly interventions in late-stage diseases. For example, Grail’s Galleri liquid-biopsy test is able to detect 50 cancers at early stages with one blood draw. A combination of data and technology, new diagnostic tools, more effective treatment modalities and better application of resources could thus help make healthcare systems more sustainable over time.

Improving healthcare systems in underserved communities

Pharmaceutical companies now realise that simply donating medicine (e.g. for cancer) to poor countries does not work as they oftentimes lack the know-how and infrastructure to diagnose complex conditions and deliver specialty medicine. A more sustainable model is

for pharma companies to invest and help these countries develop their own healthcare ecosystems. Remote training programmes were also highlighted as a way to increase access to specialty care in underserved areas. One example is Project ECHO, a global tele-mentoring programme where specialists in the developed world help upskill generalists in emerging countries into specialists, enabling better care for more people.



A Sustainable Future for *Policy*

This section summarises a panel discussion with Tharman Shanmugaratnam, Singapore's Senior Minister and Deputy Chairman of GIC; Axel A. Weber, Chairman of UBS Group AG; and Natarajan Chandrasekaran, Chairman of Tata Sons.

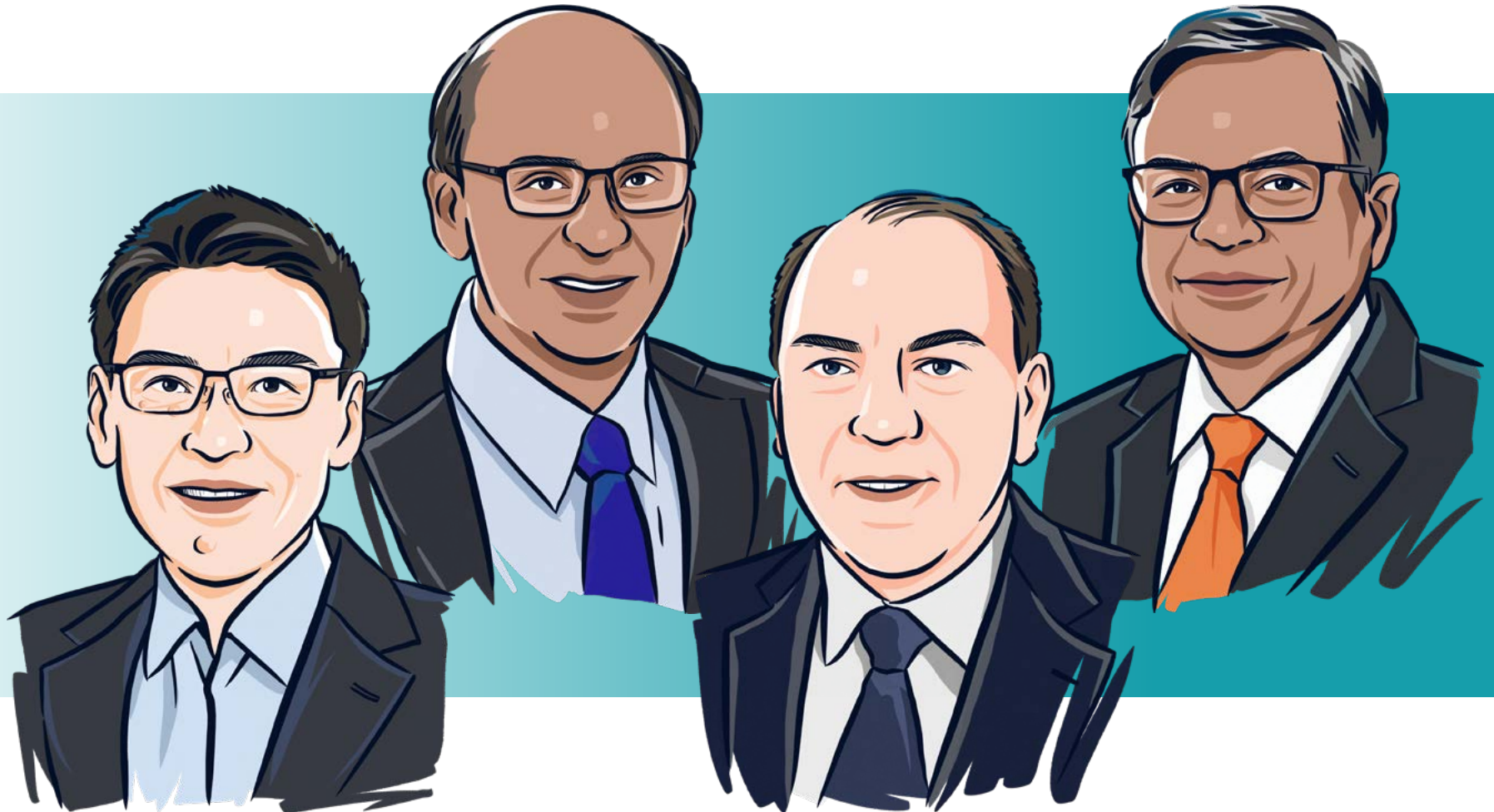
Moderated by Jeffrey Jaensubhakij, GIC's Group Chief Investment Officer, the conversation focused on policy responses to key global economy challenges including rising inflation, sustainability, and inequality. The panellists also shared their perspectives on global growth, and opinions on what central banks should do going forward.

Tharman Shanmugaratnam

Senior Minister, Republic of Singapore
Deputy Chairman, GIC

Natarajan Chandrasekaran

Chairman, Tata Sons



Jeffrey Jaensubhakij

Group Chief Investment Officer, GIC

Axel A. Weber

Chairman, UBS Group AG

Rising inflation and interest rate outlook

With growth strong and inflation rising, the Federal Reserve has announced tapering measures, a move expected to be followed by rate hikes in 2022. Despite inflation likely to remain above average targets, the panel expected US rate increases to be moderate over the next few years.

The panel thought the European Central Bank (ECB) would taper its balance sheet at a slower pace and move rates only a year or two later. The ECB was expected to exit negative rates but not move strongly into positive territory. Likewise, other central banks in Europe would not see much of a tightening cycle.

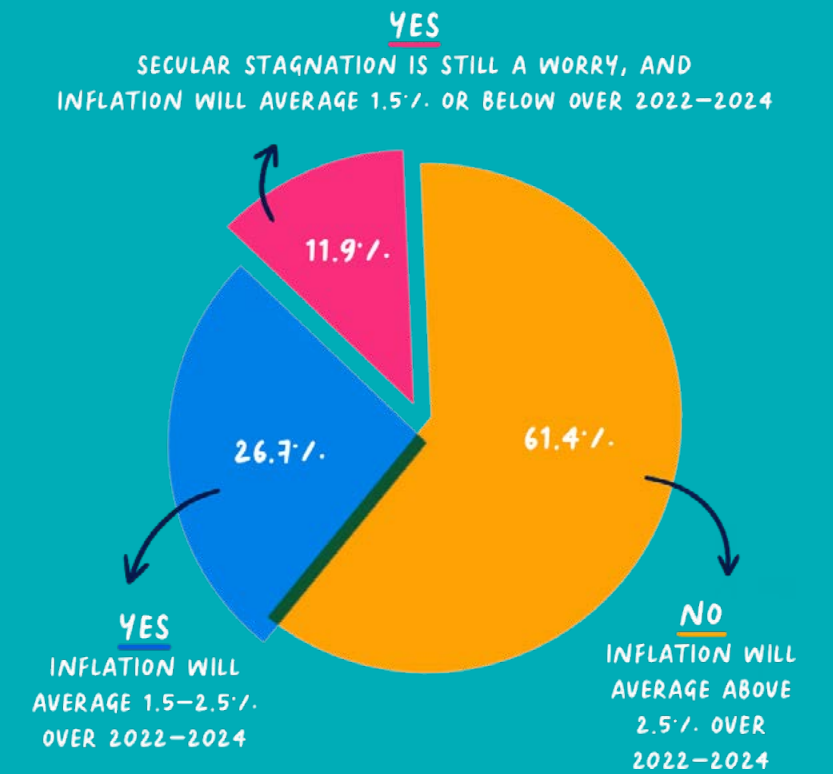
For emerging markets, the immediate concern was to pre-empt capital outflows in the face of developed market rate hikes. Indeed, some had already hiked rates as inflation started rising.

The panel discussed India’s numerous policy and reform measures including corporate tax, goods and

services tax, insolvency and bankruptcy policies, and the inflation target framework. These, together with asset monetisation plans, including the privatisation of airports and infrastructure, would support sustained growth despite potential global monetary tightening.



Central Banks globally have signalled a desire to target average inflation at **2.0%**. Current **inflation** is well above that – do you expect this to be **transitory**?



Policymaking needs to normalise

The pandemic has accelerated a policy paradigm shift with counter-cyclical fiscal deficits financed monetarily by central banks. This trend started prior to Covid-19 in advanced economies, with the pandemic leading to further surges in deficits and the need to finance them and keep interest rates low. Hence, central banks have become de-facto less independent over time.

The panel assessed that the cone of possible economic outcomes was wide. The sharp rise in inflation and energy prices were already examples of unexpected shocks. Faced with a lack of full knowledge and wider uncertainty, central banks needed to avoid basing policy on too definitive a view of the future.

The panel discussed the need for central banks to be building enough capital and liquidity buffers in monetary policy and financial regulation to reserve ammunition to combat likely shocks. There was, more broadly, a need for greater discipline in policymaking – returning to neutrality in both monetary and fiscal policy during normal times, so as to be able to respond robustly during crises and provide resilience. Normalising,

said the panel, would be an urgent task for central banks over the next few years, especially as the effectiveness of close-to-zero or even negative interest rates in stimulating the economy had become increasingly limited.

Most emerging economies had no choice but to run a more normal policy, given the disciplining effects of the markets. However, the more advanced economies, particularly those with reserve currencies, needed to exert their own discipline in reverting to running normal policy settings in normal times, rather than maintaining abnormal policies for extended periods.



Urgent need to address sustainability

The panel noted that the pace and irreversible nature of climate change meant that transitioning towards a more sustainable future was the most critical challenge facing the global economy.

This challenge involved completely transforming current energy usage patterns between now and 2050, and would require investments of US\$120 to 160 trillion,⁷ equal to the size of the global equity market.

It was imperative to shift the multilateral discussion away from that of costs or burden-sharing towards one of opportunity. The private sector had to be mobilised, as responding to climate change will be a lucrative race to develop cost-effective technologies that could be scaled globally.

Providing the right incentives to achieve collective investment in global public goods would also be key. It was noted that most technologies critical to facilitate a timely transition were not yet bankable or investable.

The public sector has to play a pivotal role by de-risking these investments to allow private capital to come in much more actively into renewables, long-distance transmission and storage, amongst others.

The developing world was still not attracting sufficient capital for its low-carbon transition, as the perceived risk remained too daunting for private capital. International organisations, multilateral development banks and regional development banks were still focused mainly on lending money. Instead it was suggested that shareholder capital should be deployed by these institutions to de-risk investments through first loss guarantees and the like. They would then be able to leverage capital markets and thus scale up the impact of their capital.

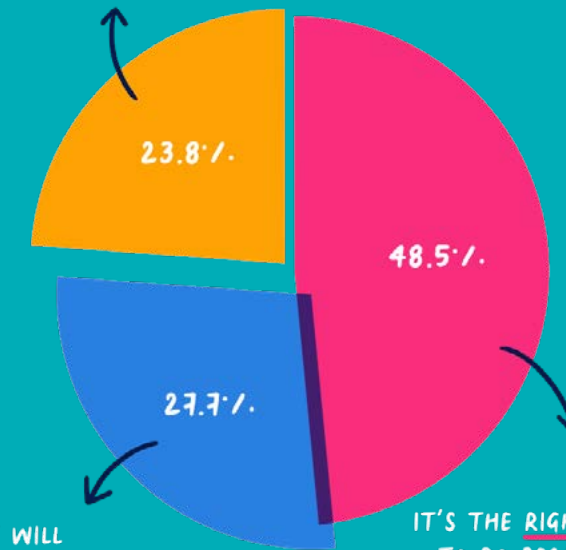
URGENT NEED TO ADDRESS SUSTAINABILITY



- 1 **ENERGY MARKETS NEED TO BE TRANSFORMED**
- 2 **INVESTMENT-SHARING PRIVATE + PUBLIC MONEY**
- 3 **PROVIDE THE RIGHT INCENTIVES MINDSET CHANGE TO INVEST IN GLOBAL PUBLIC GOODS**
- 4 **PUBLIC SECTOR TO DE-RISK INVESTMENTS ALLOW PRIVATE CAPITAL TO FLOW IN AND TO SCALE TECH**

What do you think is the most important reason for incorporating sustainability into your business or investment decisions?

IT IS INCREASINGLY BECOMING TABLE STAKES FOR MY INDUSTRY



IT WILL IMPROVE OUR LONG-TERM RETURNS

IT'S THE RIGHT THING TO DO BECAUSE OF THE RISKS FROM GLOBAL WARMING

Importance of addressing intergenerational inequality

The panel discussed the distribution of the burden of debt between today’s and future generations. Spending financed through debt should require a good rate of return, because the cost of the debt burden was being placed on future generations. For instance, total government debt of 350% of GDP in a country where only half the population was in the active workforce, is equivalent to the current generation borrowing roughly seven years of total income from future generations who would then need to work that much longer to put finances back into balance. Addressing this intergenerational inequality was imperative. If not, the ability of future generations to enjoy the same levels of welfare and wellbeing would be at risk.

The panellists warned that young protestors marching in the name of climate change might be representing future generations sounding a wake-up call amongst current generations. More innovative ways of creating equity between current and future generations must be found in order to ensure climate justice. Yet, the pandemic has forced government policymaking into

crisis management mode at the expense of the long-term consequences of the policies.

Panellists reflected that progressive politics had typically translated into more spending and larger deficits, but now required a different form of fiscal activism. Progressivity that took into account future generations required examining the shape of the fiscal curve and not just increasing spending or pushing repayment out further. In addition to progressive taxation, spending specifically targeted to spur social mobility, productivity, and upgrading in various forms would be far more effective leading to the “growth of the economic pie” and a cycle of optimism.

INTERGENERATIONAL INEQUALITY

- * **UNEVEN DEBT DISTRIBUTION TOWARDS FUTURE GENERATIONS PUT THEIR LONG-TERM WELL-BEING AT RISK**
- * **SPENDING TO SPUR PRODUCTIVITY AND UPGRADING LIKELY TO BE EFFECTIVE IN GROWING THE ECONOMIC PIE**

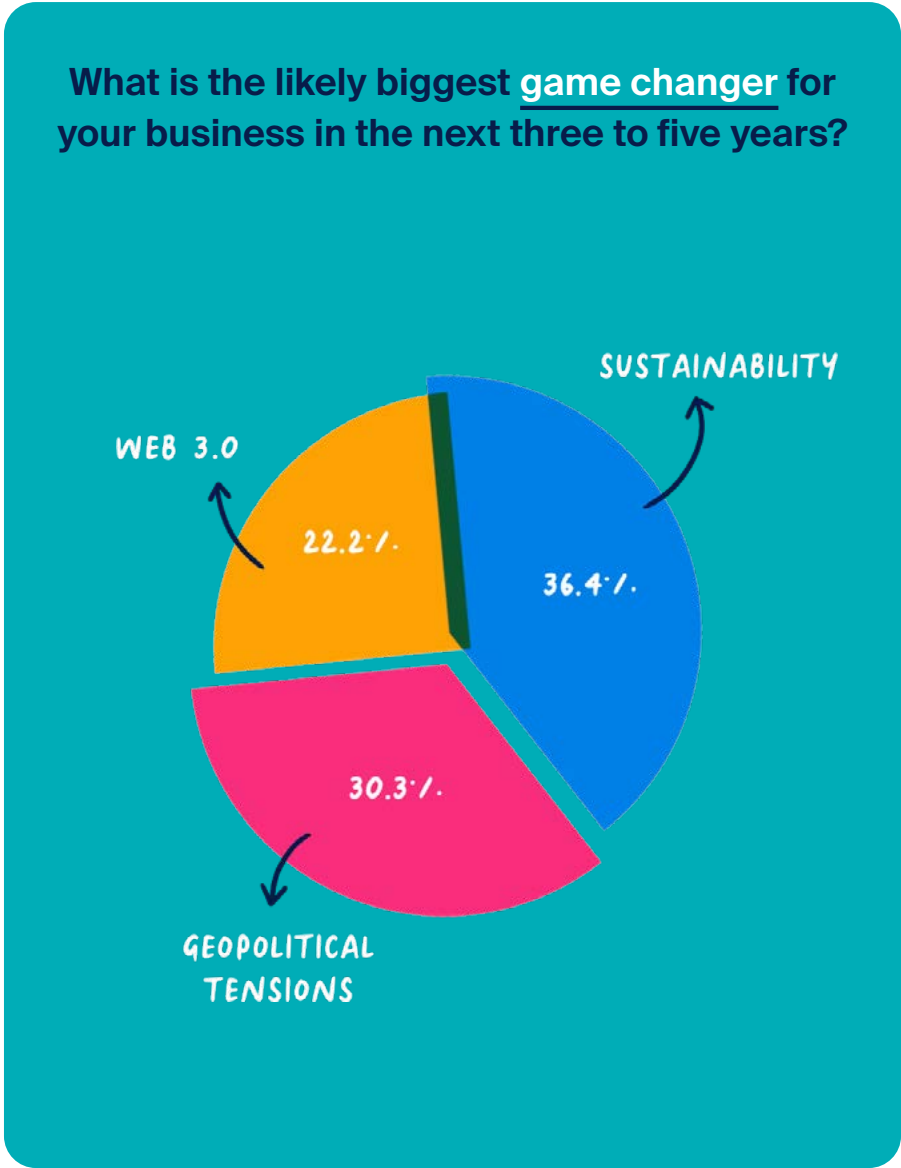


“... addressing this intergenerational inequality (is) imperative. If not, the ability of future generations to enjoy the same levels of welfare and wellbeing would be at risk.”

Allocating resources and capital for a more sustainable future

The panel concluded that there would be an immense need for capital over the next 20 to 30 years, even before taking into account another catastrophe or pandemic. However, policymakers, governments, investors and businesses needed to be extremely disciplined. It was not a question of making the money available, but also vigilance over what the capital was spent on. Private capital has a role to help governments create a future that is better, more affordable, and sustainable for all.

7. UBS (2021). *How will US\$140 trillion of investment be allocated across the energy supply chain?*



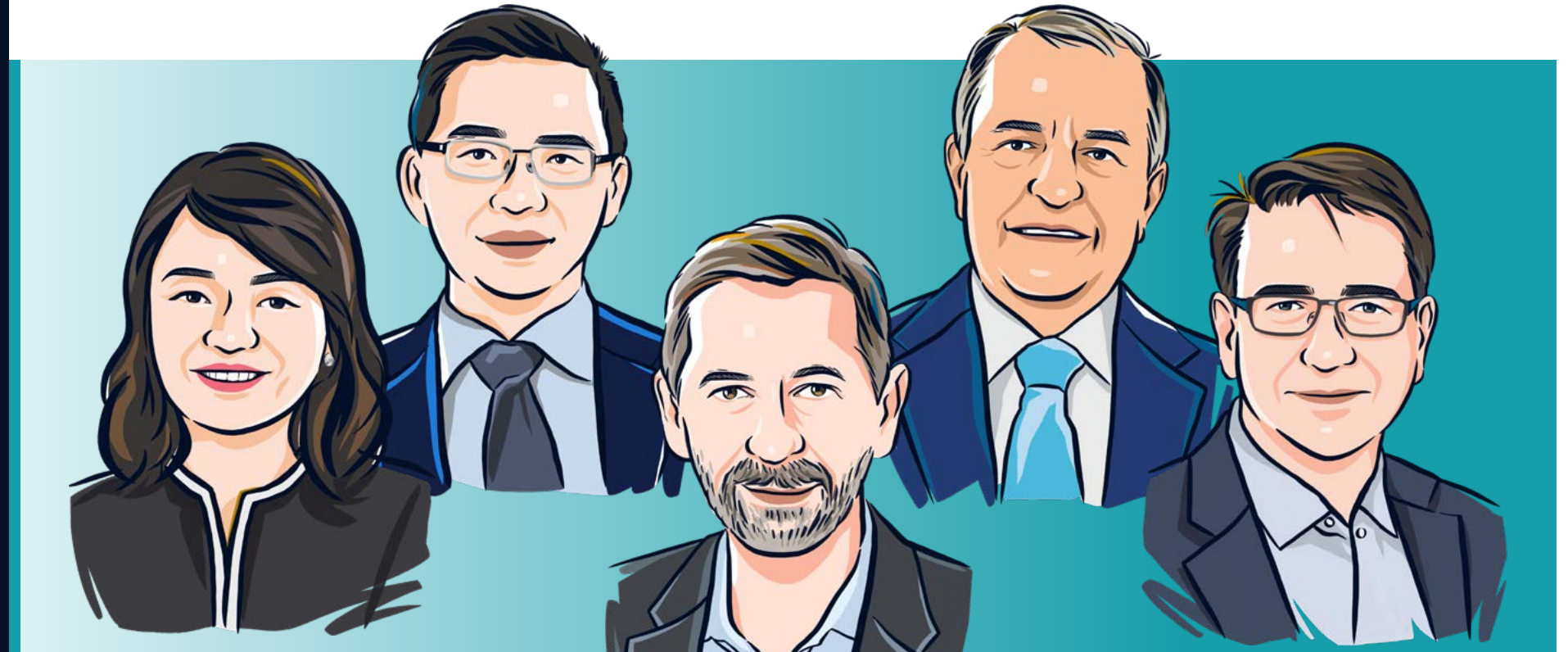
A Sustainable Future for a *Low-Carbon Economy*

This chapter presents takeaways from the panel featuring Lei Zhang, CEO of Envision Group; Hans Kobler, Founder and Managing Partner of Energy Impact Partners; Seifi Ghasemi, Chairman, President and CEO of Air Products; and Chris Shelton, Chief Product Officer of The AES Corporation, and President of AES Next.

Moderated by Liew Tzu Mi, Chief Investment Officer of Fixed Income and Chair of the Sustainability Committee at GIC, the speakers discussed the decarbonisation efforts needed and what role governments and private capital can play in this journey towards a low-carbon, sustainable future.

Lei Zhang
CEO, Envision Group

Seifi Ghasemi
Chairman, President and CEO, Air Products



Liew Tzu Mi
Chief Investment Officer, Fixed Income
Chair, Sustainability Committee, GIC

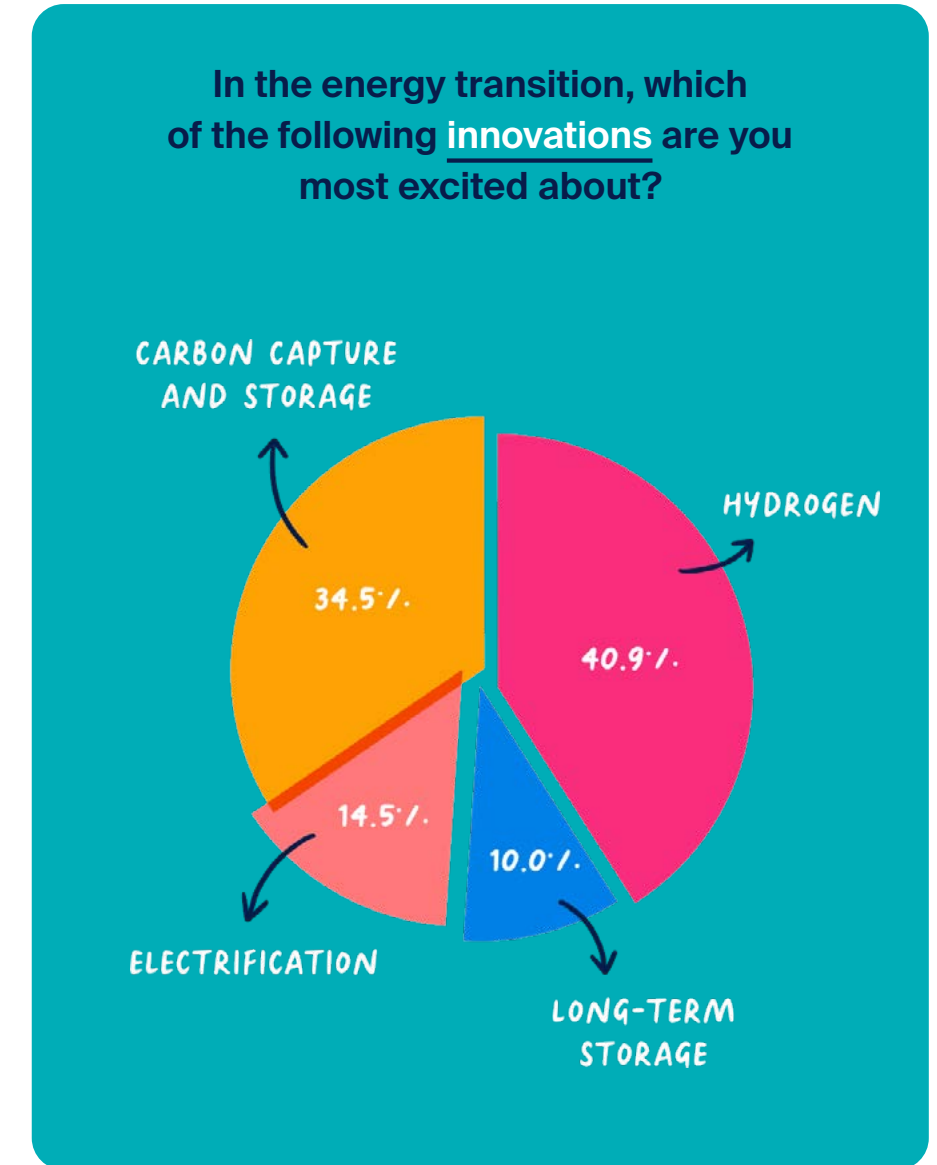
Hans Kobler
Founder and Managing Partner,
Energy Impact Partners

Chris Shelton
Chief Product Officer, The AES Corporation
President, AES Next

COP26 has seen ambitious commitments made to tackle everything from deforestation to methane emissions to the phasing out – or down – of fossil fuels. According to the panel, it remained to be seen, however, whether these lofty announcements would translate into tangible climate action to meet the temperature goals set by the Paris Agreement.

It was also acknowledged that while the resolve by governments and the private sector to address the climate crisis was undeniable, the practical pathway to get to these commitments was less clear. Transitioning from fossil fuels to clean sources of energy in the long term while adopting low-carbon technologies that can drive decarbonisation efforts now would without a doubt form a critical part of net zero plans.

MORE PRACTICAL PATHWAYS NEEDED FOR COP26 COMMITMENTS



Long-duration storage is key

With a steady decline in costs,⁸ the speakers discussed that wind, solar and lithium-ion batteries had the potential to decarbonise 80 to 90% of the power sector. Addressing the remainder 10 to 20% would be contingent on resolving the intermittency issues associated with renewables. With increased solar and wind capacity, long-duration storage including multi-day and seasonal storage could be critical to turning renewables into round-the-clock resources and to paving the way for a carbon-free grid.

While lithium-ion batteries are best suited for daily storage and distribution of energy, solutions such as iron-air rechargeable batteries could potentially store electricity for up to 100 hours.

It was also mentioned that long-duration storage still lacked the critical breakthrough to scale, and that most companies in this space were still in the process of proving that their technology is reliable, and that their business model could be cost-effective and sustainable over the long term.

Is hydrogen the future?

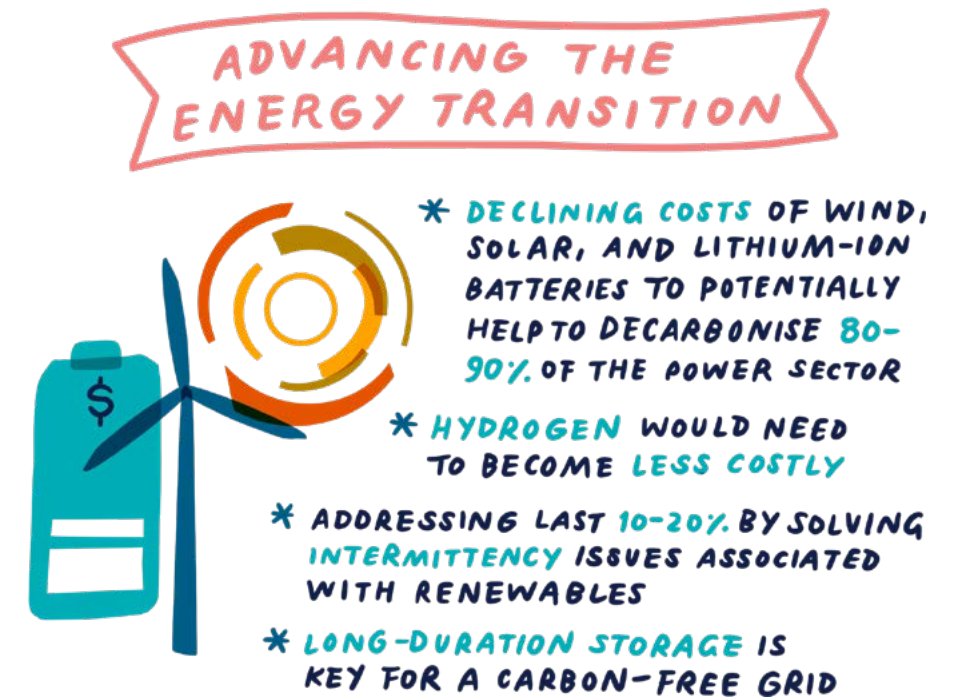
In addition, in certain hard-to-abate sectors such as heavy industries, including steel, cement and aluminium, chemical production, or heavy-duty transport such as shipping, trucking or aviation, electrification is challenging because of high costs or reliability issues.

The panel observed that hydrogen could provide these sectors with the means to decarbonise. Hydrogen burners, together with electric heating, could help generate the high temperatures required in heavy industrial processes. Meanwhile, the transport sector could swap fossil fuels for hydrogen fuel.

However, green hydrogen, the cleanest form of hydrogen produced from surplus renewable energy sources using a process called electrolysis, makes up a small percent of overall hydrogen production, mainly because of the cost gap with hydrogen from unabated fossil fuels.⁹

Blue hydrogen which is produced from natural gas or methane, and where the carbon generated is captured and reused or stored underground, could offer an interim solution.

To be economic, it was noted, hydrogen would ultimately need to become significantly less costly.



Introducing the net zero industrial park

The panel introduced the concept of the net zero industrial park¹⁰ which combines many of these low-carbon solutions, including wind, solar and hydrogen, as well as battery and electric vehicle (EV) manufacturing, in a single location. By integrating energy production, storage and consumption, it aims to eliminate the need to build costly long-distance transmission lines, address challenges related to intermittency, and provide a low-cost and reliable 24-hour source of electricity.

The first pilot project is being built in Ordos, Inner Mongolia with the objective of assisting the net zero transition of a traditionally coal-producing region. The park will be connected by an electric truck transportation network and will be managed by an Artificial Intelligence of Things (AIoT) operating system. It essentially brings together e-mobility, renewable energy and smart digital solutions in a systems-based approach.

Financing the energy transition

The panel discussed that while climate tech had undoubtedly gone mainstream, with valuations doubling and deal sizes increasing by 50 to 70%, more capital was needed than ever to accelerate the clean energy transition. Investor support would be key for both existing solutions such as wind, solar and batteries, and emerging technologies such as green hydrogen, long-duration storage or carbon capture and storage (CCS) to scale.

The International Energy Agency (IEA) estimated that to reach net zero by mid-century, global clean energy investment would need to more than double by 2030 – from just over US\$2 trillion to almost US\$5 trillion per annum.¹¹

To address the potential risk of climate tech turning into another dot-com bubble, the speakers explained that unlike many of the businesses that had gone bust during the Internet bubble, climate tech investors were dealing mostly with real companies working on real technologies. The investment required might be higher compared to the Internet, but so are the opportunities.



“By integrating energy production, storage and consumption, a net zero industrial park aims to eliminate the need to build costly long-distance transmission lines, address challenges related to intermittency, and provide a low-cost and reliable 24-hour source of electricity.”

The need for more regulatory support

It was also observed that a more enabling regulatory environment would be crucial to both increase clean energy production and galvanise demand by consumers.

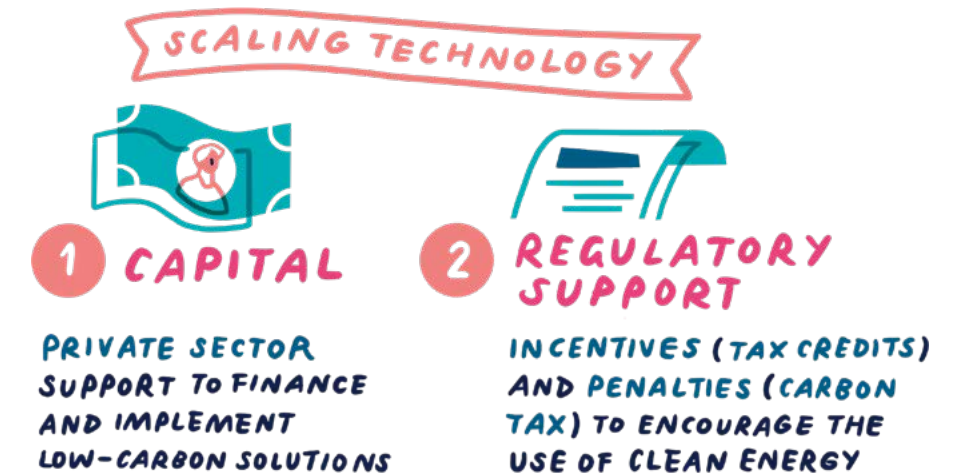
For example, Germany’s recently reformed Renewable Energy Sources Act (EEG),¹² which was originally enacted 20 years ago, set grid priority for onshore wind, solar and biogas, and provided them with generous feed-in tariffs. As a result, together with hydro and offshore wind, these renewable sources of energy now cater to almost half of the country’s electricity consumption.¹³

It was noted that policymakers must also commit to long-term support. Spain and Italy had introduced feed-in tariffs for solar, only to then cut back on these incentives which decimated the industry.

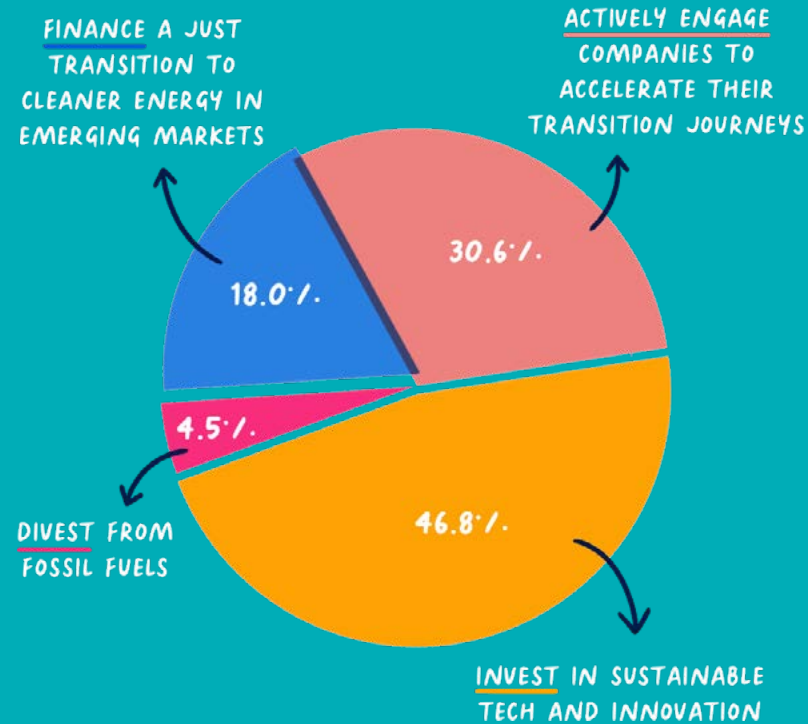
Tax credits for renewables in the US¹⁴ were mentioned as another example of incentivising clean energy projects, although the panellists cautioned that the “carrot” approach might not be sufficient without the “stick” – a potential global carbon tax on polluting industries.

The panel agreed, however, that it might be challenging to get governments around the world to agree on a universal carbon price. According to the International Monetary Fund (IMF), only one-fifth of global emissions are currently covered by pricing programmes, and the global average price is a mere US\$3 a ton compared to the approximate US\$75 a ton required to keep global warming below 2°C above pre-industrial levels.¹⁵

IMF data¹⁶ has also shown that fossil fuel subsidies made up US\$5.9 trillion – or 6.8% of global GDP – in 2020. Without putting a price on carbon and cutting back on fossil fuel support, the panel discussed that green hydrogen would struggle to compete with its oil and gas or coal competitors.



What can business leaders do?



Ultimately, climate change will impact every country, industry and company. The panel concluded that the private sector must play a significant role in advancing the low-carbon transition, and shared a few suggestions on what business leaders should do to shape a more sustainable economy:

- Embrace the energy transition and prepare your business for it.
- Set near-, medium- and long-term climate targets and engage the whole company in your sustainability efforts.
- Work towards and support cost-competitive and scalable low-carbon technologies.
- Identify and understand where the opportunities or threats are.
- Take risks and make bold decisions.
- Seek out and work together with like-minded partners.

8. IEA (2021). *Renewable Energy Market Update 2021*.
9. IEA (2021). *Global Hydrogen Review 2021*.
10. Envision. *Net zero industrial park*.
11. IEA (2021). *Net zero by 2050: A roadmap for the global energy sector*.
12. Clean Energy Wire (2021). *What's new in Germany's Renewable Energy Act 2021*.
13. Clean Energy Wire (2021). *Germany's energy consumption and power mix in charts*.
14. US EIA. *Renewable energy explained: Incentives*.
15. IMF (2021). *Five things to know about carbon pricing*.
16. IMF (2021). *Still not getting energy prices right: A global and country update of fossil fuel subsidies*.



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