



# Navigating the Global Transition

Summary Report

1. About GIC Insights	3
2. Opening Remarks	4
3. The Global Macro Transition	10
4. The Digital Economy Transition	15
5. The Sustainability Transition	19
6. The Geopolitics of the Energy Transition	23

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.

#### **Navigating the Global Transition**

Structural shifts are underway globally across multiple dimensions. As more markets move towards endemicity and normalised policymaking, the private sector will play a bigger role in supporting growth going forward. Rapid technological adoption



and progress, and the urgent need to act on sustainability risks are also transforming the role of regulation, consumer behaviour, business models and economic structures.

However, this transition journey is unlikely to be smooth as markets respond to the changes amidst elevated valuations, very low real interest rates, record high public debt levels, and persistent inflationary and geopolitical pressures.

At GIC Insights 2022, we discussed these fundamental shifts, and the challenges and opportunities faced by policymakers, businesses, and investors.

About

**GIC  
Insights**

Good afternoon, GIC Board Directors, honoured guests, ladies and gentlemen. A very warm welcome to GIC Insights. Thank you for joining us.

We organise this forum to share insights and show our appreciation. Most of you already collaborate very closely with GIC. For that, we thank you.

With that, let's review the theme of the forum, "Navigating the Global Transition". This afternoon, we look at three fundamental transitions: macro, digital, and sustainability.

For all these developments, GIC has more questions than answers. Geopolitics, for example, presents a complex set of issues. We think about it as comprising two parts: chronic and acute challenges.

- Chronic issues, such as gradual tit-for-tats, are quite difficult to deal with but manageable.
- Acute problems, including sudden military incidents like the war in Ukraine, are impossible to predict with confidence. For investors, this is made more challenging as we need to find the right investment instruments and transact at the right prices.

We may not even have the right questions. So, to help us, we have assembled a whole host of expert panellists and speakers. I thank them for their help.



Lim Chow Kiat, CEO, GIC

We also want to get to solutions and actions. That's why we partnered FCLTGlobal, a long-standing champion of long-term investing, which GIC has long been associated with, to bring their C-suite roundtable discussions here. You will have the opportunity – and task – to tackle the issue of "balancing resilience with agility". After the discussions, we will develop a toolkit<sup>1</sup> to help turn your insights into actions and improve our organisations for the future.

Let me now share my thoughts on the three transitions - macro, digital, and sustainability - and the key questions I hope we can tackle today.

<sup>1</sup> GIC (2022).  
*Balancing  
Resilience and  
Agility to Deliver  
Long-term  
Performance.*

## 1. Opening Remarks

**Firstly, the macro transition.**

- Let’s use the 60/40 portfolio to illustrate the issue. The 60/40 portfolio has become a popular, standard asset mix over the past four decades. No one seems to remember its origin. It is popular primarily because it has delivered good returns over long periods of time. That changed this year. The 60/40 portfolio has just experienced its worst performance in the last century. Both bonds and equities sold off. There has been a big jump in the correlation between them, eliminating the portfolio diversification benefit.
- Our Bridgewater friends would say the correlation jump was incidental, which we agree with. The more fundamental drivers are the higher discount rates and the expectation of a poorer growth/inflation mix - the much dreaded “stagflation”.
- A key macro variable is interest rates. Will we go back to a zero-interest world, which seemed to have sustained a lot of businesses? Beyond the current overheating in the economy, deglobalisation and decarbonisation trends are pointing to a more inflationary world ahead of us.

Yet a return to the ‘70s seems too pessimistic, or at least we are hopeful that central banks will remain determined to anchor long-term inflation psychology.

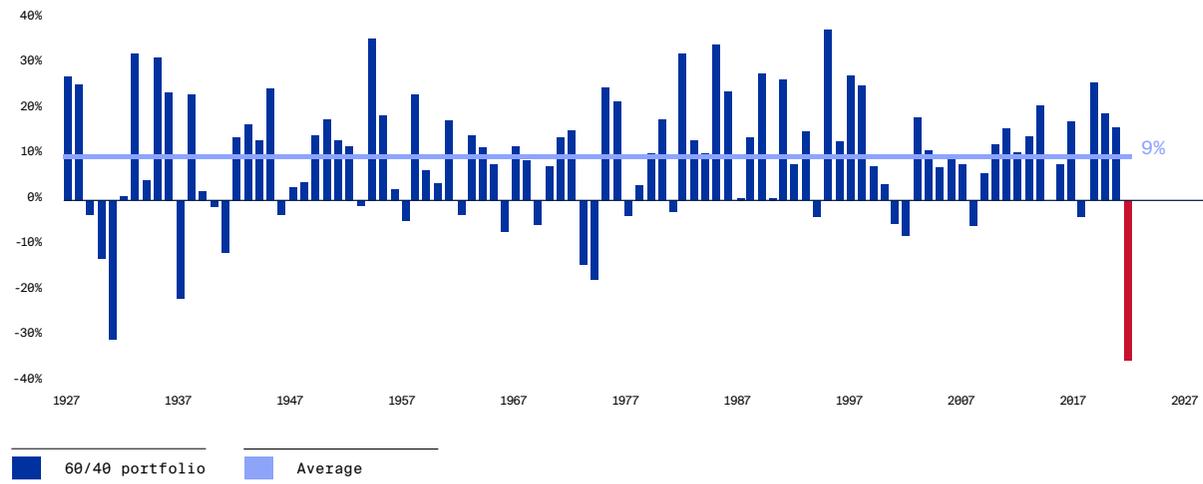
- This leaves us with several questions:

- **What’s the growth-inflation mix we are likely to see in the coming years?**

- **Have we truly left the world of “lower for longer”?**

- **Should we be concerned about financial stability?**

**Annual 60/40 Portfolio Performance**



Source: Bank of America, GFD

**The second transition is digital.**

- The **end of cheap capital** has decimated the fringes of the tech industry. The loss-making tech complex is down an astonishing 70-80% year to date<sup>2</sup>. If you assume that the complex has an interest rate duration of approximately 30 years, that magnitude is about right. A 2.5% change in interest rate multiplied by 30 years is about 75%.
- **Scarcity of capital** is a huge challenge, particularly, for early-stage companies. As top-line difficulties are likely to play out, cost discipline and balance sheet strength are critical for survival now. Investors are hopeful of more rational competition and less wasteful spending. Having the financial strength and playing the long game will likely offer a huge competitive advantage as the weaker ones falter. That's the lesson from history.
- History also teaches us that we should not throw the baby out with the bath water. Digital innovation continues to scale and impact the real economy.
- For investors, the tech sector offers a unique value proposition in the form of platform

companies with vast total addressable market and networks. Their scale and scope are a great advantage, because revenues can scale without additional new dollars being invested, resulting in tremendous capital efficiency.

- But such a tech advantage has also produced more negative externalities. Issues related to data privacy, increasing digital divide, the risk of monopoly power, cyber risk, supply chain dependency, and ethics are becoming more and more critical.

- Against this backdrop, we must ask:
  - **How should tech companies deal with scarcity of capital?**
  - **Which tech trends deserve the most investor attention?**
  - **What should our expectations of regulation be given the list of negative externalities?**

<sup>2</sup> Goldman Sachs non-profitable tech stock index

<sup>3</sup> 2020 for connected devices and robotics, 2021 for EVs

**Unprecedented acceleration of digital innovation**

		Today <sup>3</sup>	Tomorrow (2030)
	<b>Number Of Connected Devices</b>	30 billion	125 billion
	<b>Global Daily Data Traffic</b>	57 EB	4,394 EB
	<b>Global Robotics Market</b>	\$25 billion	\$160 billion
	<b>Annual Passenger Ev Sales</b>	4 million	37 million

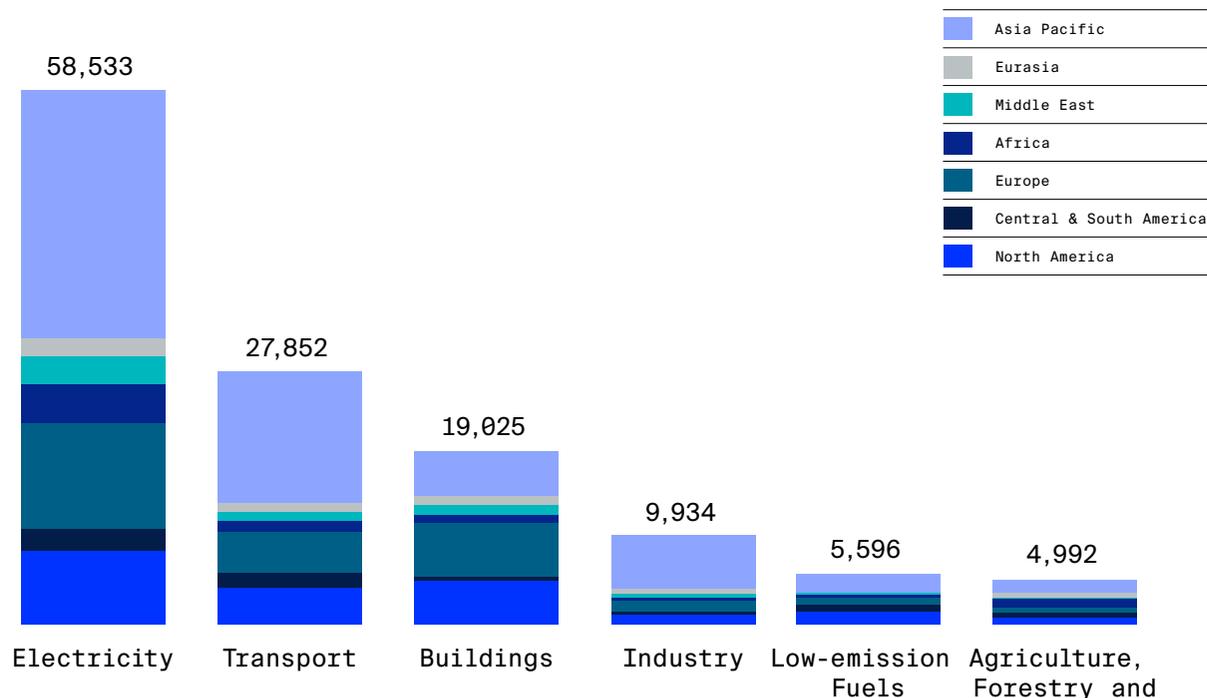
Source: IHS Markit, ITU, BCG, Goldman Sachs

### Thirdly, the sustainability transition.

- The role of climate finance was front and centre at COP27. Based on the IEA's "Net Zero Emissions by 2050" scenario, transition in the real economy will require an additional US\$126 trillion from now until 2050, and almost half of this money is needed in Asia-Pacific.
- These significant financing requirements also offer potentially big opportunities for investors. Importantly, they are also a must-do, given the severe negative return consequences of a transition failure.
- GIC looks at the task by first dividing the investment universe into three categories.
  - Using the MSCI ACWI Index as a reference point, high-emitting assets in sectors such as electricity, transport, and buildings make up about 10% of market cap, but account for 40% of Scope 1 and 2 emissions, so their transition will make a huge difference. Equally, companies in this space that are not able or willing to make this transition will become stranded.

### Scale up in capital required by region and sector in a Paris-aligned pathway, 2021-2050<sup>4</sup>

Investment gap<sup>5</sup> for climate solutions (2021-50 compared to historical, USD billion)



Source: GIC Sustainability Office calculations, Vivid Economics, IEA, FOLU, and NGFS Data

<sup>4</sup> Excludes investment in fossil fuels

<sup>5</sup> 'Investment gap' reflects the additional investment needed in 2021-2050 on top of historical levels to reach net zero by 2050 using the IEA Net Zero Emissions by 2050 scenario

- At the other end of the spectrum are green assets deriving a high percentage of their revenues from green activities such as renewable energy and other decarbonisation solutions. GIC has been quite active in investing in this area, but as you can see from the Index proxy, these assets only make up a small part of the investment universe. We need to help to grow this. GIC would like to play a role in developing the ecosystem, including the off-take market and creating customer demand for climate solutions such as green hydrogen.

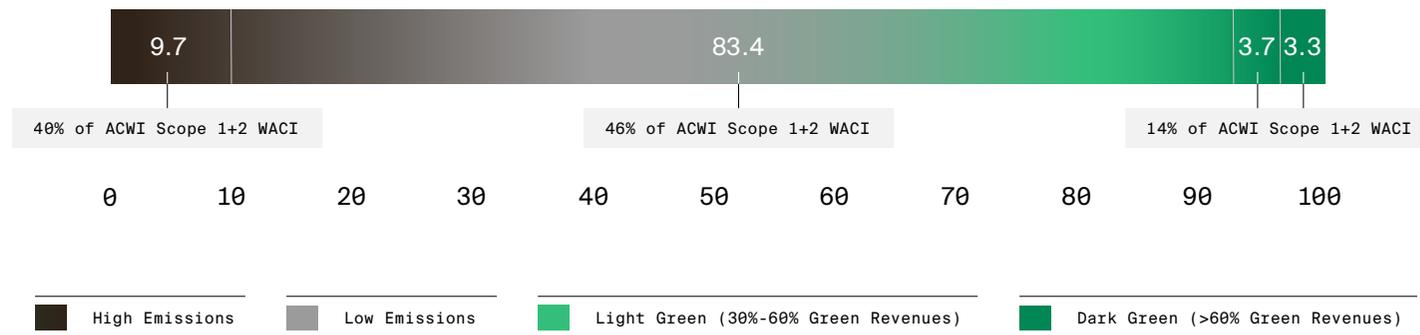
- The in-between segment is the largest, making up almost 85% of the index. They have a lower emission intensity compared to high-emitting assets, but they also need to transition urgently.

- GIC has engaged with a number of these companies. For example, through an industry engagement programme (AIGCC’s Asia Utilities Engagement Program), we worked with a Hong Kong utility set targets to phase out coal by 2040 and reach net zero by 2050. I had previously reported that we had provided US\$2bn in transition finance to Duke Energy

Indiana in the US. We also invested in a Korea-based chemical company to help it replace oil-based plastics with renewable raw materials, switch to renewable energy for its operations and introduce CCU (carbon capture and usage) by 2050. We have since expanded our investments to its battery subsidiary.

- Making these investments bankable is not easy. In an ideal situation, cost-competitive new technologies or innovative business models allow for cost-effective and scalable solutions.

**% of MSCI ACWI Market Cap (31 Oct 22)**



Source: GIC Sustainability Office calculations, MSCI, Factset, FTSE Russell

More likely, there would be additional costs to be borne among governments, customers, existing shareholders and perhaps, if possible, multilateral organisations or philanthropic funds. Not all can afford it. We were looking closely at the US Inflation Reduction Act and that is a good example of government support with a comprehensive set of incentives. But not all governments can afford to implement those kinds of programmes.

- Most sustainability goals can be captured under the “iron triangle” of sustainability, security and affordability. Achieving each goal is difficult on its own; achieving all three is much more challenging. The current energy crisis is a case in point.
- Some questions for this transition include:
  - How can we scale transition finance, especially in emerging markets where it is most needed?
  - How can investors help develop the off-take market?
  - Which new technologies are most promising?

### MACRO TRANSITION

- \* 60/40 PORTFOLIO
  - DELIVERED GOOD RETURNS IN THE PAST
  - RECENTLY: WORST PERFORMANCE IN 100 YEARS
- \* INTEREST RATES ARE A KEY MACRO VARIABLE
- \* POTENTIAL FINANCIAL STABILITY RISKS
- \* MORE INFLATIONARY WORLD AHEAD
  - DUE TO DEGLOBALISATION DECARBONISATION ETC

### DIGITAL TRANSITION

- \* CHALLENGES END OF CHEAP CAPITAL SCARCITY OF CAPITAL
- \* PLAY THE LONG GAME COMPETITIVE ADVANTAGE
- \* DIGITAL INNOVATION CONTINUES TO SCALE & IMPACT THE REAL ECONOMY
  - RESULTS IN CAPITAL EFFICIENCY
  - BUT RAISES ISSUES E.G. CYBERSECURITY, DATA PRIVACY, DIGITAL DIVIDE ETC

### SUSTAINABILITY TRANSITION

- \* APAC HAS LARGEST INVESTMENT GAP\* USD56TN
  - \* GIC ACTIVELY INVESTS IN GREEN ASSETS & ENGAGES COMPANIES TO SUPPORT THEIR TRANSITION
- BASED ON THE IEA NET ZERO EMISSIONS BY 2050 SCENARIO

### Conclusion

We have reached a tipping point where we now have to deal with the consequences of our cumulative actions or inactions over the years. Years of easy money need to be repaid. Years of digital splurge need to be rationalised. Years – in fact decades and centuries – of emissions need to be accounted for.

We need to navigate these transitions well. Let's hear from the panels on how we can do so.

I wish you a good Insights.

“ We have reached a tipping point where we now have to deal with the consequences of our cumulative actions or inactions over the years. ”



From left to right: Anne Richards, Greg Jensen, Jeffrey Jaensubhakij, Raphael Arndt & Lei Zhang

## 2. The Global Macro Transition

This section summarises a panel discussion with Raphael Arndt, CEO of Future Fund; Greg Jensen, Co-CIO of Bridgewater Associates; Anne Richards, CEO of Fidelity International; and Lei Zhang, Founder and Chairman of Hillhouse.

Moderated by Jeffrey Jaensubhakij, GIC's Group Chief Investment Officer, the conversation looked at the

increasing impact policy changes have on markets and what investors can do to build resilient portfolios. The speakers also discussed the economic outlook for different regions and how the world can tackle the climate crisis through greater cooperation.

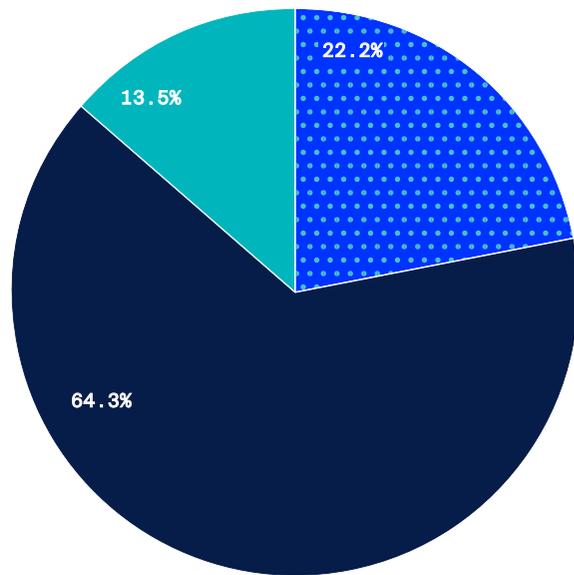
### When policymakers influence markets

The current volatile global economy is characterised by persistent inflation, continued policy tightening, rising geopolitical fragmentation and an unprecedented energy and climate crisis. In the midst of this, the panellists pointed out that the role of policymakers had risen to the fore, with long-term investors and forward-looking corporations having to increasingly navigate an economy overwhelmingly influenced by policy rather than free markets.

They noted that this might be the first time in a long time that policymakers have played such a central role in driving macroeconomic direction, evidenced in actions like the Federal Reserve’s monetary tightening policies. They predicted that government intervention in the economy could be more common and more intrusive – regulating businesses, compressing margins, influencing trade, and changing tax mixes.

Even so, the speakers remarked that as a result of continued elevated inflation, policymakers might still face significant constraints in implementing either monetary or fiscal policy to combat an impending global recession – one that could hit next year, according to a recent World Bank study<sup>6</sup>. They also noted that central banks faced increased difficulty

**Many predict that we are headed for - or are already in the midst of - a global economic downturn. How long do you estimate a potential recession to last?**



as their inflation models had shown poor predictive power amidst the volatility.

On the timing of markets’ reactions to the impending recession, there were differing views among the panel. Some noted that as the markets had not priced in a possible recession with persistent inflationary pressures, further market volatility may still to come, and could lead to a longer, deeper downturn. However, others said that inflation expectations could start to come down in the second half of 2023, leaving more potential for an upside surprise, especially in Asian markets where central banks are not as behind the curve.



Despite the gloomy outlook, the panel agreed that investment opportunities were still available. These included real yields from inflation-indexed bonds, private markets, as well as in countries that could benefit as companies seek to diversify their manufacturing from China.

<sup>6</sup> The World Bank (September 2022). *Risk of Global Recession in 2023 Rises Amid Simultaneous Rate Hikes.*

### Think resilient portfolio, not assets

When discussing resilience, the speakers thought it was important to build resilient portfolios of assets, rather than focusing on particular assets that one might label “resilient”. They stated that investors would know, for instance, that bonds and cash are resilient in a business cycle recession while gold and commodities help to manage downside risk in an inflationary recession.



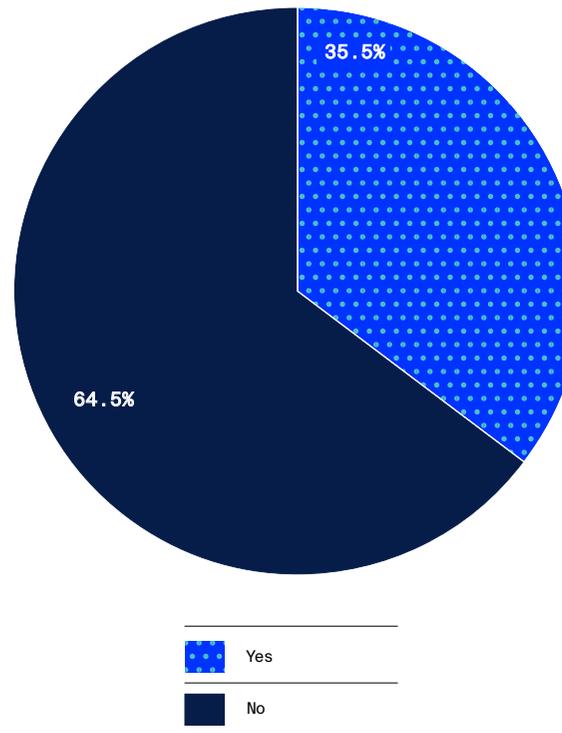
The panellists discussed alternative ways that investors could shore up their portfolio. These included using skill-based strategies and

geographical diversification. They also said that stock-picking skills and operational value-creation capabilities had become more valuable as global macro trends had become less supportive of aggregate asset class returns.

When looking at companies to invest in, the speakers highlighted adaptiveness, strong fundamentals, and being within sectors that provided value creation and high growth opportunities. They noted that such companies were able to quickly respond to the rapidly changing environment and have leveraged technology to develop innovative solutions which could help push down costs and buffer against top-down macroeconomic difficulties.

Ahead of 2023, the panel cautioned against thinking markets would follow the macro environment. Some pointed out that markets tended to anticipate and move ahead of the economy, a possibility that investors should bear in mind as they execute their strategies.

Is the 60/40 portfolio dead?



## A tale of two continents

The panel also discussed the contrasting economic outlooks of Europe and Asia over the next six to 12 months. With war at Europe's doorstep and its direct consequences, particularly on energy and food prices, the speakers reflected that there seemed to be a real sense of fear among policymakers of the income effect on wide swathes of the population. They noted that the expectation for the continent to suffer a difficult recession in 2023, combined with other secular and cyclical factors, might also result in populist policies.

To avoid the full brunt of a downturn, the panellists stressed that cooperation within the European continent would be vital. They pointed out that the Russia-Ukrainian war had already precipitated some of this, and that relations between the United Kingdom and Europe had also showed signs of warming, with some movement to reduce frictions on trade underway. Even then, the panel recognised that Europe's political situation remained volatile, with policymakers potentially reacting to the war and the changing economic situation in a diversity of ways, which would contribute to increasing unpredictability from an investor's standpoint.

Meanwhile, Asia presented a far more optimistic picture for investors. The panellists noted that Asian markets would likely recover from an impending recession sooner than their European counterparts. Fund managers are already making a beeline for places like Southeast Asia<sup>7</sup>, as the region's stability and growth prospects make it far more attractive. From manufacturing solar-powered batteries to exporting nickel, Asia remains a bright spot.

On China, while the panellists recognised that investors would have to remain careful, undertake extensive bottom-up due diligence, and even opt

for more liquid investments, they concurred that it should remain a part of any investor's portfolio. The key would be to understand the politics and what the Chinese government's policy stances mean. They said that it was now clear, based on the latest Party Congress, that the country would be pursuing "modernisation with Chinese characteristics". This approach, they explained, emulates specific government policies from other countries, such as housing or education, but tailors them for China. It also potentially opens up opportunities in investing in the green economy and social sectors.



<sup>7</sup> Fidelity International (October 2022). [Q4 Asia Investment Outlook: Potential bright spot amid a challenging winter.](#)

## Businesses need more policy signalling to reach sustainable goals

One thing the panellists agreed on was how climate change would be a significant factor when it comes to investor demand. They highlighted that even as corporations must continue to step up their sustainability commitments, governments needed to also send stronger policy signals on the demand side – be it policies that promote the use of solar panels in buildings or which make it easier to own an electric vehicle.

The panellists agreed that by now, businesses and governments recognised the cost of failing to meet their 2050 climate targets and agreed that the consequences would be vast. Increasingly, sustainability has become embedded within organisations, a move that panellists applauded, even while they warned that corporations should be wary to not become complacent about their integration efforts. More debated, according to the panel, was the trajectory to getting to key climate goals within the next 30 years. Critical factors of consideration should include energy security, in addition to the diversity of economies and countries that transition pathways would have to be tailored to.

Beyond cooperation between governments and businesses, the panellists also emphasised the need for greater collaboration among businesses themselves. Within an incrementally fragmented global supply chain, the panel pointed out that companies would do well to collaborate to facilitate the energy transition needed to manage climate risks.



Even as these challenges are posed to businesses and policymakers, the panel acknowledged that significant investment opportunities remained, particularly in Asia and in climate-related solutions – a bright spot for investors in what may be a volatile 2023.



Lei Zhang, Founder and Chairman of Hillhouse



From left to right: Eric Wilmes, Nathan McCauley, Jerry Ng & Ravi Menon

3.

## The Digital Economy Transition

This section summarises the panel discussion featuring Nathan McCauley, Co-Founder and CEO of Anchorage Digital; Jerry Ng, Founder and Chairman of Bank Jago; and Ravi Menon, Managing Director of the Monetary Authority of Singapore (MAS).

Moderated by Eric Wilmes, GIC's President of Americas and Head of Private Equity, Americas, the speakers discussed how the global financial industry can harness opportunities, manage risks, and balance regulation with innovation as the digital economy continues to evolve.

### Digitalised finance can be transformative, if applied correctly

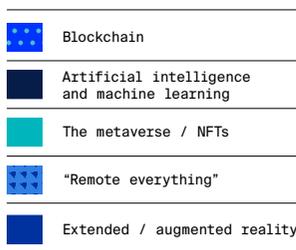
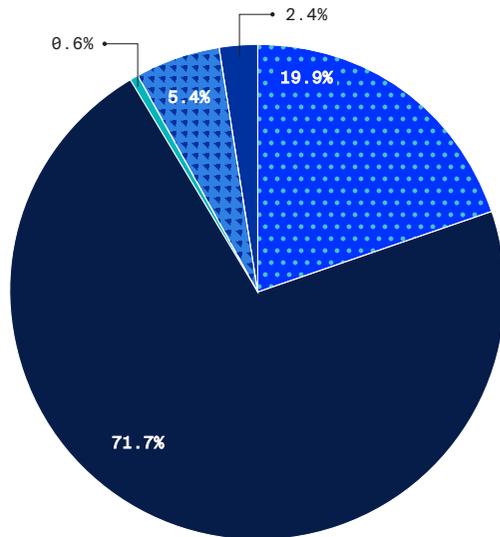
With the recent fall of FTX and the Luna crypto crash earlier last year, a series of market developments have shaken global confidence in cryptocurrencies.

While these fallouts have destabilised the crypto world, the panellists believed that the future of blockchain technology – a digitally distributed, decentralised, public ledger that facilitates the process of recording transactions and tracking assets in a business network – remains bright. For blockchain to be used successfully, innovators should focus on using this technology on real-world problems and use cases, coupled with the right governance.

In particular, the speakers shared that in the digital asset ecosystem, the use cases that can ride on the concepts of atomic settlement, programmable money, and asset tokenisation will be most transformative for the following reasons:

- Firstly, blockchain technology can potentially provide greater convenience in regional cross-border payments. Through such initiatives, the panel noted that digital technologies have the potential to reduce inefficiencies in the

As we look towards leveraging technology to solve real-world problems, where do you see the greatest opportunities?



pre-trade and post-trade capital markets, avoiding duplicated reconciliation exercises and double invoicing in banks, for example. This is how a distributed ledger with digital tokens can work to enable efficiency.



- Secondly, the panel agreed that digitalisation and digital assets can potentially drive greater financial inclusion. With over 1.7 billion people without access to financial services globally, blockchain and decentralised networks have the potential to be leveraged as a global public utility. Such use cases can drive globalisation forward, which has been receding in recent years. Asset tokenisation can also be used to monetise collaterals, potentially enhancing financial and social inclusion.

- Thirdly, the panel observed that digitalisation can pave the way for greater transparency. By using a distributed ledger, blockchain technology ensures that all transactions are tracked, making the data easily visible. Despite its public nature, these transactions also cannot be manipulated or deleted, eliminating the risk of fraudulent activities.

### Maintaining an optimal balance between innovation and regulation

The speakers, however, also agreed that regulation will be critical for blockchain to thrive and for digital innovation to continue. Smart regulation will engender trust, while minimising risks such as:

- Money laundering and terrorism financing
- Cybersecurity and technology threats
- Investor harm (retail investors often put in more than they can afford to)
- Stablecoin instability
- Financial instability (ensuring the volatility of the crypto market does not spill over to the formal financial system)

- Lack of accountability in decentralised finance (Tokenisation enables decentralised finance which removes the need for finance intermediation. This introduces risks as transactions can be carried out through smart algorithms and are often made anonymously.)

While there are worries that smart regulation could hamper innovation, the panellists believed the two can co-exist. For instance, stablecoins can be backed by full reserves in cash or a cash equivalent like gold. Being pegged to cash or commodities allows supply to be controlled, providing them with a firm value.

As an example, MAS has been working on several pilot programmes that look to combine smart regulation with blockchain innovation. One of them is Project Guardian, a programme that explores the tokenisation of financial assets and enables real-time settlements, while being implemented under strict regulations<sup>8</sup>. This programme enhances security by using regulated financial authorities as trust anchors to verify entities and check their credentials. Ultimately, strict protocols must be enforced to establish accountability in a decentralised financial market.

<sup>8</sup> Monetary Authority of Singapore (October 2022). *Project Guardian*.



Additionally, the panel noted that there is also a need for regulation to address the separation of concerns as many crypto companies often combine huge numbers of offerings onto a single platform, where they can play the role of a custodian, an exchange, and a trading firm all in one entity.



**Building the right infrastructure to support the growth of digital finance**

As the global financial industry evolves alongside the digital economy, the panellists discussed that the next step is to create a proper set of infrastructure to support its growth. This will build

greater connectivity across countries and foster proper governance, setting the rules of the game in the digital realm.

Beyond infrastructure, digital finance institutions and banks also need to prepare for a complex and unpredictable future that will elicit both excitement and concern. To protect their balance sheets and be ready to adjust in an agile manner, financial institutions will need to have a combination of defensive and offensive strategies.

Ultimately, the panel surmised that digital finance, especially led by blockchain technology, while promising, remains very much in its infancy. Scaling it safely will require discipline and a laser-like focus on applying it to real-world problems.



Jerry Ng, Founder and Chairman of Bank Jago



From left to right: Liew Tzu Mi, Alexander Tancock & Maya Chorenge

## 4. The Sustainability Transition

This section presents the key takeaways from the panel featuring Alexander Tancock, CEO of InterContinental Energy; and Maya Chorenge, Co-Managing Partner of The Rise Funds, TPG.

Moderated by Liew Tzu Mi, Chief Investment Officer of Fixed Income and Chair of the Sustainability

Committee at GIC, the panellists discussed the key challenges faced in climate investing and the global transition to a net-zero economy, the role of regulators, and the importance of both climate adaptation and mitigation as well as focusing on both environmental and social impact.

### The need for deep knowledge and large capital

In November 2022, United Nations Secretary General Antonio Guterres kicked off COP27 with a powerful warning: “humanity has a choice – cooperate or perish”. Certainly, the window for taking decisive action on climate change and sustainability is closing rapidly. As a result, the last few years have seen a significant increase in the amount of capital flowing into climate solutions and subsequently, an increase in the number of climate-related opportunities available.

The panel shared that such a vast range of opportunities requires investors to gain a deep understanding of different sectors and technologies. This is to identify not just what is impactful, but what is investable and when the best time to invest is.

In terms of where the best opportunities are, the audience identified green hydrogen as the most promising game changer in the energy transition, followed by carbon capture and storage, carbon removal, and long-duration storage.

Elaborating on the potential of green hydrogen, the speakers noted that while it is not the only solution to decarbonising the energy sector, it is a vital part

of the equation. They added that green hydrogen is simple and sustainable, making it an ideal replacement for fossil fuels and chemicals which make up ~2/3 of global energy consumption<sup>9</sup>. The challenge is being able to produce clean energy at a large enough scale which will require substantial capital. According to the Energy Transitions Commission, decarbonising energy and other industries globally will require nearly US\$15 trillion in investment from now till 2050<sup>10</sup>.

**SUSTAINABILITY AFFECTS EVERY ASSET CLASS & SECTOR!**

**ENERGY TRANSITION**

GREEN TRANSITION REQUIRES SIGNIFICANT CAPITAL

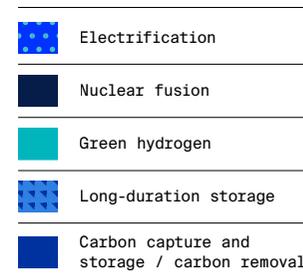
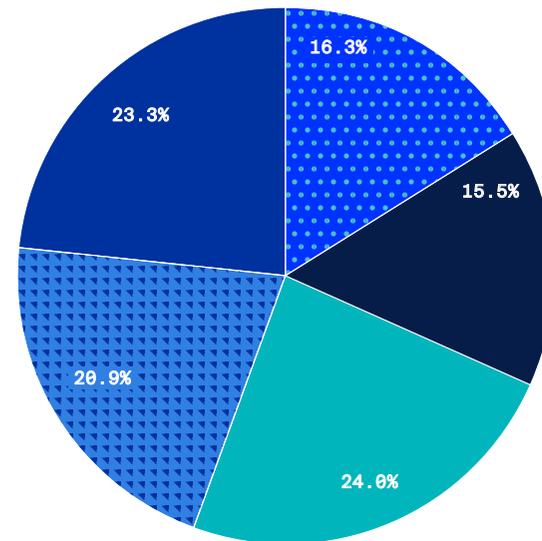
\* GREEN HYDROGEN IS NOT A SILVER BULLET BUT IT IS VITAL FOR DECARBONISATION

1/3 OF ENERGY WE USE IS ELECTRICITY

2/3 ARE FROM CHEMICALS & FUELS!

WE NEED GREEN HYDROGEN & OTHER CLIMATE SOLUTIONS TO DECARBONISE 2/3 OF OUR ENERGY

Which of the following is the most promising and scalable game changer for energy transition?



9 REN21 (2022). *Renewable Energy Data in Perspective*.

10 Energy Transitions Commission (April 2021). *Making the Hydrogen Economy Possible*.

### Climate adaptation remains important

While climate mitigation solutions such as green hydrogen are important, the panel also drew attention to the need for climate adaptation to help the world cope with the devastating physical effects of the climate crisis, such as rising temperatures and increasingly frequent natural disasters.

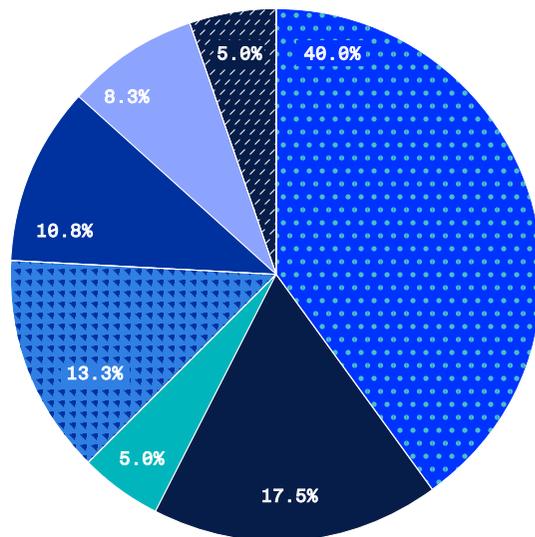
One example is Climavision, a weather tech start-up that uses data and artificial intelligence to predict weather patterns. The solution is used by logistics companies, government agencies, and even hedge funds. For example, it may help a logistics firm understand how best to reroute their services in case of weather extremes, or a government body to identify the most vulnerable areas with an immediate need for aid.

### Balancing ESG and returns, solving the energy trilemma, and the role of regulators

The panel discussed a few critical challenges presented by the sustainability transition, including balancing ESG outcomes and investment returns, and solving the “energy trilemma”.

The trade-off between “doing well” versus “doing good” was likewise identified by the audience

What is the single biggest challenge you need to overcome in order to invest more in sustainability?



	Trade-offs between investment returns and ESG outcomes		Low carbon prices / no global carbon pricing
	Lack of scalable solutions		Limited internal buy-in / consensus & lack of urgency
	Technological disruptions risks in existing solutions		Insufficient expertise
	Limited regulatory incentives and support		

as a key obstacle to drawing in more capital. The speakers shared that while it may not apply to every sector, certain opportunities could offer both high returns and high impact. They added that for more of these investments to be made possible, governments must introduce more incentives to help offset certain risks that investors are not yet willing to bear. This will help unlock a greater flow of capital to fund important technologies and help them achieve scale.

Examples of such incentives include the United States (US) Inflation Reduction Act and the European Union (EU) REPowerEU Plan, which will invest ~US\$370 billion<sup>11</sup> and ~€300 billion<sup>12</sup> in energy security and climate change, respectively.

The panel also discussed the “energy trilemma”, which refers to the challenge of achieving sustainability, cost efficiency, and energy security all at the same time. They shared that energy security especially has become increasingly important given recent geopolitical tensions, adding that investors will likely bring energy back to the fore in the years ahead. Resolving the trilemma will require greater regulatory support, such as increased carbon taxes, but the onus is also on markets to play a more significant role.

<sup>11</sup> The White House (August 2022). [Inflation Reduction Act Guidebook](#).

<sup>12</sup> European Commission (May 2022). [REPowerEU: A Plan to Rapidly Reduce Dependence on Russian Fossil Fuels and Fast Forward the Green Transition](#).

### Bringing back the focus on social equity

The panel reflected that given the magnitude of climate issues, a lot of attention is placed on the environment and as a result, social equity can sometimes be overlooked, particularly in emerging markets. They added that the “E” and “S” in ESG are closely linked and highlighted the importance of climate justice given that the effects of climate change are most deeply felt by lower-income communities.

One of the panellists provided an overview of potential metrics to measure social impact, such as looking at the benefits of providing people with improved access to finance, education, healthcare, and more, in the same way we would quantify the reduction of carbon emissions. Robust impact measurement will enable investors to place a greater focus on social investing.

The panel also shared that often, paying attention to the “S” in ESG can have a positive impact on a company’s business operations and bottom line. For example, when InterContinental Energy identified the potential for a large-scale green hydrogen project on the traditional lands of the Mirning Nation in Western Australia, they first established a groundbreaking partnership with the Mirning

involving carried equity, a permanent board seat, and other benefits. By incorporating “S” considerations upfront, innumerable benefits have already been seen, which are leading to a larger and better project.

In sum, the panellists concluded that achieving a net-zero economy while also advancing social equity and enabling a just transition is possible, but ultimately requires greater action from everyone, from consumers to businesses to government bodies.



Maya Chorengei, Co-Managing Partner of The Rise Funds, TPG





From left to right: Daniel Yergin & Prakash Kannan

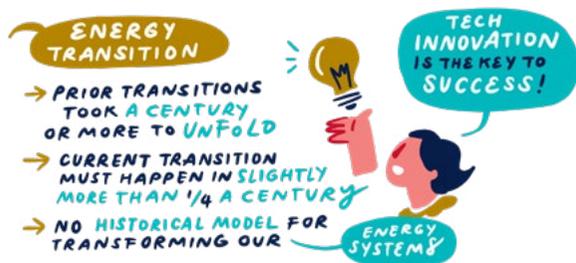
5.

## The Geopolitics of Energy Transition

This article is an adapted summary of a keynote speech and fireside chat with Daniel Yergin, Vice Chairman, S&P Global, and Author of “The New Map: Energy, Climate, and the Clash of Nations”. Moderated by Prakash Kannan, Chief Economist and Head of Total Portfolio Macro & Markets, GIC, the session considered the opportunities and challenges presented by the energy transition and its implications for energy security, the oil and gas market, and supply chains more broadly.

## A brewing energy crisis

Contrary to popular belief, the energy crisis did not begin with Russia's invasion of Ukraine on 24 February 2022, but with the post-pandemic economic recovery in the latter part of 2021. Global economic growth surged to 5.9% in 2021<sup>13</sup>, exacerbating pressure on energy supplies.



US President Joe Biden's announcement in November 2021 of an additional release of crude oil signalled a burgeoning energy crisis – the stage for which had already been set by “pre-emptive under-investment” in oil and gas. According to estimates, global upstream investment in hydrocarbons remained depressed in 2021 at \$341 billion, nearly 25% below pre-pandemic levels<sup>14</sup>. Reasons for this

trend include poor returns following two oil price crashes in just seven years and uncertainty about future demand. Regulatory and investor pressure to pivot to cleaner sources of energy have also grown, limiting access to finance for fossil fuel development<sup>15</sup>.

With European gas markets reeling from Russia's attempt to leverage it as a second front in the Russia-Ukraine war and given insufficient renewable energy supplies to effectively meet global energy needs, the issue of energy security has gained renewed focus.

## An unprecedented energy transition ahead

Energy transitions are not new, but prior transitions were not so much transitions as they were additions to the existing energy landscape. The discovery of coke – a form of processed coal – as a more efficient material than wood in the smelting of iron ore in 1709 and the drilling of the first modern oil well in Western Pennsylvania in 1859 signalled a shift from wood to coal and coal to oil respectively. These transitions also took a century or more to unfold.

There is no model for what is being attempted now, which is to change the energy foundations of a world economy worth roughly \$100 trillion<sup>16</sup> in slightly more than a quarter century. This monumental task requires urgent action in four key areas:

“  
There is no model for what is being attempted now, which is to change the energy foundations of a world economy worth roughly \$100 trillion<sup>16</sup> in slightly more than a quarter century.  
”

- **Energy security** must be prioritised after years of being taken for granted. Geopolitical developments, such as the Russia-Ukraine war, have highlighted the importance of balancing stable energy supplies today with the need to speed up the energy transition for the future.
- The **macroeconomic impact** of the energy transition requires deeper analysis, addressing the costs and time involved. Experts in Europe warn about potential unintended consequences, including economic disruptions on the scale of the energy crisis and global recession of the 1970s<sup>17</sup>.

13 S&P Global Market Intelligence, December 2022.

14 IEF (2021). *Oil and Gas Investment Outlook*.

15 Daniel Yergin (2022). *Bumps in the Energy Transition*.

16 Visual Capitalist (2022). *The \$100 Trillion Global Economy in One Chart*.

17 Jean Pisani-Ferry (2021). “Climate Policy is Macroeconomic Policy, and the Implications will be Significant,” Peterson Institute for International Economics; “The Missing Macroeconomics in Climate Action” in S. Tagliapietra, G. Wolff, and G. Zachman, eds., *Greening Europe's Post-Covid-19 Recovery*, Bruegel.

- As developing countries demand more funding to enable an inclusive and equitable transition, the need to address the current **North-South energy divide** has taken centre stage. As more financial institutions pledge to stop financing new fossil fuel projects, emerging markets criticise such decisions for curbing their access to funding to build infrastructure such as natural gas pipelines that would be critical to their energy security in the absence of sufficient renewable energy supplies. It could also limit economic opportunity while exacerbating health issues such as indoor pollution from continued reliance on burning wood – or trash – for power.

- With the rise of mineral-intensive climate solutions, the move from **“big oil to big shovels”**<sup>18</sup> must involve securing new supply chains to meet rising demand. With policy incentives such as those introduced by the US’ Inflation Reduction Act to promote the adoption of clean energy technologies, demand for minerals such as copper is set to soar<sup>19</sup>. However, operational and geopolitical constraints remain. It can take 16 to 25 years to develop mining projects from discovery to first production<sup>20</sup>, and many of these raw materials are concentrated in high-risk countries that might not be supportive of new investments in the mining industry.

been increasingly investing in climate tech in order to future-proof their businesses. They have made forays into molecules, such as hydrogen, ammonia and biofuels, and electrons, or electrification. While an electron-based approach is supported by the rapid growth of wind and solar and an uptick in demand for electric vehicles, developing these other molecules will be equally important, especially in heavy transport and residential heating systems where the barriers to electrification are higher. As it is, despite their rapid growth, wind and solar currently comprise about 3% of world energy, while hydrocarbons account for about 80%<sup>21</sup>.

Challenges to deploying these new solutions at scale remain, however. Green hydrogen, for example, enjoys considerable regulatory incentives and offers significant potential, but the technology still faces major obstacles, most notably much



### Tech innovation will be key

The EU’s ban on the purchase, import, or transfer of crude oil products from Russia to the EU began on 5 December 2022, with an additional ban beginning in February 2023. This has prompted the US to take the lead in imposing price caps on Russian oil to avert an oil crisis arising from shortages, but enforcement difficulties may cause disruptions to markets.



Amidst these uncertainties and in response to stakeholder pressures, oil and gas companies have

18 Daniel Yergin (2020). *The New Map: Energy, Climate, and the Clash of Nations*.

19 S&P Global (2022). *World copper deficit could hit record; demand seen doubling by 2035*: S&P Global.

20 IEA. *Reliable supply of minerals*.

21 IEA (2022). *World Energy Outlook 2022*; *BP Statistical Review of World Energy*

higher costs compared to blue hydrogen, challenges of scale, and constrained commercial viability, including market demand.

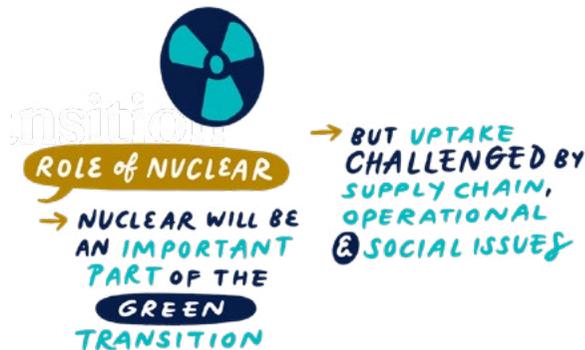
### Potential in nuclear, but obstacles abound

It will be difficult to make the energy transition without nuclear energy as a climate-friendly alternative to fossil fuels that already avoids 1.5 gigatonnes of global emissions and 180 billion cubic metres of global gas demand per year<sup>22</sup>.

One key obstacle to nuclear energy is geopolitics. Russia dominates the nuclear fuel cycle value chain, providing 35% of enriched uranium<sup>23</sup> – necessary for use in nuclear reactors – globally. However, Russia is no longer regarded as a reliable supplier of energy, owing to the Russian-Ukraine war and Russia’s weaponising of natural gas.

The uptake of nuclear energy also faces social, cultural, and operational challenges. Germany abruptly decided in 2011, immediately after the Fukushima disaster, to shut down its nuclear power industry, which at the time provided 25% of the country’s electricity. That is now widely seen as a major mistake, undermining Germany’s energy security and leaving its economy highly vulnerable

with the Ukraine war and the cut-off of Russian gas exports to Europe. While the energy crisis has prompted a delay in the mothballing of Germany’s last three nuclear power plants, it is unlikely that the phase-out policy will be reversed.



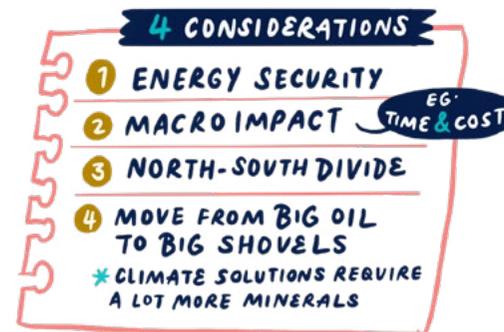
Meanwhile, ageing nuclear reactors in France and delayed maintenance owing to Covid-19 have put part of France’s nuclear fleet out of operation, although remediation is proceeding and reactors are coming back into operation. With its long-term focus on energy security, Japan currently has seven operational nuclear power plants and the government is seeking to restart a number of other plants.

Despite such challenges, there is a growing view that nuclear energy must play a critical part in the energy transition.



Daniel Yergin, Vice Chairman, S&P Global

Ultimately, amidst the current energy and geopolitical crisis, it’s increasingly recognised that a multitude of solutions are required to accelerate the energy transition and that such a transition must go hand in hand with greater energy security worldwide.



22 IEA (2022). *Nuclear Power and Secure Energy Transitions.*

23 Energy Monitor (2022). *Cutting Nuclear Links With Russia May Be Harder Than Cutting Fossil Fuel Imports.*



GIC is a leading global investment firm established in 1981 to secure Singapore's financial future. As the manager of Singapore's foreign reserves, we take a long-term, disciplined approach to investing, and are uniquely positioned across a wide range of asset classes and active strategies globally. These include equities, fixed income, real estate, private equity, venture capital, and infrastructure. Our long-term approach, multi-asset capabilities, and global connectivity enable us to be an investor of choice. We seek to add meaningful value to our investments. Headquartered in Singapore, we have a global talent force of over 2,000 people in 11 key financial cities and have investments in over 40 countries.

For more information

[www.gic.com.sg](http://www.gic.com.sg)



For more information on GIC Insights, please visit:  
[events.gic.com.sg/gicinsights](http://events.gic.com.sg/gicinsights)

For more content from GIC, please visit:  
[gic.com.sg/thinkspace](http://gic.com.sg/thinkspace)