

Mining & Metals Scenarios to 2030

WORLD ECONOMIC FORUM

in collaboration with

the **INTERNATIONAL FINANCE CORPORATION** and **MCKINSEY & COMPANY**

Description

Geo-economic landscape

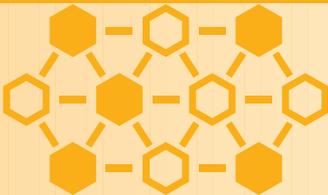
Green Trade Alliance



In 2030, the world is divided and countries are defined economically by whether or not they belong to the Green Trade Alliance (GTA), formed in 2016 to promote “environmental sustainability without compromising competitiveness.” GTA countries, including some industrialised, resource-rich and developing countries, have experienced a period of accelerating innovation and lifestyle changes. While there is strong alignment among GTA countries, non-GTA countries operate independently.

- **Environmental standards** are used as the basis for **protectionist measures** by GTA countries
- **Limited cross-border flows** between GTA and non-GTA countries

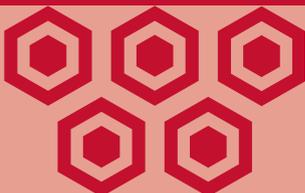
Rebased Globalism



In 2030, the world is committed to realising the benefits of global interconnection but has become far more complex and multipolar. Power comes from control of resources as well as possession of capital, with resource-rich countries playing by their own rules. Civil society has gained power, resulting in various local laws that affect global corporations.

- **Economic power** is held both by markets where there is **strong demand** – such as the EU, the US, China, Brazil and India – and by countries that **control strategically important resources**
- **Cross-border flows** are extremely open
- **Free market principles** hold forth, favouring privatization and financial liberalization
- Some states set out to **capture more social value** from their commodities through in-country processing and manufacturing

Resource Security



In 2030, the era of globalisation is a distant memory as nations prioritise narrow self-interest. They hoard domestic resources, enter cartels based on regional and ideological alliances and resource blocs, and engage in neo-colonialism and import substitution strategies.

- Markets are shaped by **state interventionism**
- **Trade** is defined by a complex web of **protectionist barriers** and **preferential agreements**
- **Limited cross-border flows** of products, labour and capital

Geopolitical landscape

- World with **tense relations between GTA and non-GTA** countries as they use different approaches to compete for resources
- Emergence of the **Sustainable Trade Organization (STO)** to facilitate and enforce GTA trade agreements

- **Multipolar world** with broad commitment to reaping the benefits of **globalisation and interconnectedness**
- **International decision-making** becomes **cumbersome** with numerous players included in the process. **Agreements** are reached **bilaterally** or **among smaller** groups of countries
- Proliferation of **local regulations**, which are strongly enforced

- **Globalisation stalls** amid geopolitical instability and an emphasis on national self-interests
- **International institutions** fade into **irrelevance**
- **Ideology** increasingly plays a role in the **choice of allies**

Economic outlook

- **Global GDP** growth averages around **2% annually**, as a result of **shifting trade patterns**
- In the GTA, an important new metric called **GDP+** incorporates **environmental, sustainability and social indicators**
- **Investment capital** comes with **“green ties” or “no ties”** depending on its origin

- **Global GDP** growth averages around **4% annually**
- High levels of **investment capital** are available, but there are often **strict conditions** on how investments will affect social development
- **Demand** for commodities is **high**, as are prices
- Most of the **largest companies** in the industry come **from emerging countries**

- **Global GDP** growth averages around **1.5% annually**
- Many countries revert to some form of **import substitution**
- **Limited capital** available for the mining sector
- Country **risk limits** private sector capital for **overseas investment**
- Sudden and unpredictable resource constraints lead to **extremely volatile prices**

Environmental outlook

- In **GTA countries**, there are decisive and radical environmental policies and changing consumer behaviours. Advanced **“cradle to cradle”** metals and minerals stewardship helps **determine trade-offs** about resource use
- In some **non-GTA countries**, **action** is motivated by the desire to **overcome impediments to economic growth** and in others there is **no effort** to address environmental concerns

- Local laws **protect local environments**, but there is no significant progress towards a widely adopted CO₂ reduction agreement
- Growing acceptance that it is too late to prevent climate change and that efforts must **focus on adaptation**

- Resources and technologies that are most readily available domestically are favoured, **irrespective of impact on environment**

Partner Views



“Crises usually create seismic shifts with long term consequences. The current global economic crisis is certainly driving profound sea changes across the metals and mining industry.

The Mining & Metals Scenarios to 2030 project has identified the major forces emerging from the crisis that will have an impact on our industry for a long time to come. The World Economic Forum has produced a timely roadmap into an uncertain and volatile future for an industry that will play a major role in shaping that future.”

Klaus Kleinfeld

President and Chief Executive Officer, Alcoa Inc.



“The scenarios addressed, involving discussions with over 200 leaders from the private sector, government, academia and international and non-governmental organizations, are

immensely thought provoking and challenging to current business and investment strategies. From transformational breakthroughs in technology; the existence of a 'G42,' a 'second scramble for Africa,' to sovereign default, nationalizations and neo-colonial practices, the wide range of scenarios and their implications will provide a sophisticated tool in helping our sector identify and question underlying assumptions and shape future strategic options.”

Cynthia Carroll

Chief Executive, Anglo American Plc



“In our age of ever-increasing globalization, the impact of a decision in what once was a completely unrelated sphere in a country far away from our area of operations can have

profound consequences on the financial viability of our company. Scenario planning, once a somewhat arcane science practiced by a few specialists, has become a strategic imperative that one ignores at the risk of one's future. The World Economic Forum is an arena where thinking of the highest strategic level takes place; putting this level of strategy into practical use involves an estimation of the many possible outcomes of each possible course of action. The people creating these scenarios have a great influence on the practical implementation of the ideas of some of the great businesspeople of our time.”

Oleg V. Deripaska

Chief Executive, Basic Element



“The World Economic Forum Scenarios projects serve as a timely reminder to us all of the uncertain future faced not only by the metals and mining industry but more importantly by those people

who on a daily basis are so dramatically affected by the social, environmental and economic impacts of the private sector. Over one-third of the people on our planet are living in poverty and it is the responsibility of business, government and civil society to find new ways together of tackling the imbalance of wealth across the world. I hope that those business leaders and decision-makers who have contributed so energetically to this project are now able to drive forward strategic partnerships and inspire innovations within the mining and metals industry in order to help bring about the systemic change required to adequately address the global challenges faced by us all.”

Helene D. Gayle

President and Chief Executive Officer, Care USA



“The scenarios highlight a number of challenges the mining industry will face over the next 20 years. In nearly all scenarios, developing countries will be the source of much of the world’s

supply of minerals. In these countries, IFC will continue to work with private investors and others to address economic, social, and environmental challenges to ensure that mining is a driver of sustainable development and helps reduce poverty.”

Lars H. Thunell

Executive Vice-President and Chief Executive Officer, International Finance Corporation (IFC)



“Built from strategic dialogues with multiple stakeholders, the Mining & Metals Scenarios to 2030 open the space of possibility for long-term thinking and stimulate thought and

discussion. Each scenario is a unique opportunity for all to stretch reflection on the future and prepare for capturing longer term opportunities.”

Ruben Verhoeven

Director, Leader of Basic Materials Practice, McKinsey & Company



“The rapidly changing global economy with the critical role of regions with high growth potential, as well as the recognition of the climate change challenge, make the development of a

scenario framework an important task that can help business with long range planning. As management, I pay utmost attention to business strategy, and the 360 degree approach of the World Economic Forum provides an integral outlook that takes into account all stakeholders’ views on the sector’s development. Our business and the sector as a whole will benefit from the long-term perspective this analytical tool brings to our planning. Together we can take the responsibility to address the strategic issues and challenges, steering the world to a sustainably prosperous future.”

Igor Syry

Chief Executive Officer, Metinvest Holding LLC



“Recognizing that the mining industry needs to do a better job of understanding and explaining its potential economic, social and environmental contributions to communities of interest

and thought leaders, it was agreed last year in Davos that the industry should undertake a comprehensive scenario planning process. This process has focused on what the environment for the global mining and metals sector might look like in 2030, drawing on the expertise of hundreds of experts from the industry and from various affected stakeholders and interested institutions. The scenarios will provide a key foundation for the industry’s strategic planning and outreach efforts as it prepares for the Rio +20 summit in 2012.”

Richard O'Brien

President and Chief Executive Officer, Newmont Mining Corporation



“The World Economic Forum Mining & Metals Scenarios to 2030 project makes a tremendous contribution to the strategic planning process at OPK.

We constantly review the scenarios in order to identify critical business issues that are likely to have greatest impact on our corporation in order to make sure that the decisions we make today will give us comparative advantage in the future no matter which scenario will take place.”

Alexander V. Gnusarev

Chairman of the Board, United Industrial Corporation (OPK)

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Preface

In collaboration with its constituents in the mining and metals sector, the World Economic Forum launched the Mining & Metals Scenarios to 2030 project in January 2009. This report is the outcome of a year-long process which brought together over 200 leaders from the private sector, government, academia and international and non-governmental organizations in a strategic dialogue structured by scenario planning methodology to consider the following central question: “How will the environment for the global mining and metals sector look in 2030?”

The project aims to:

- stimulate dialogue between the public and private sectors and civil society regarding the future of the mining and metals sector
- deepen insight into the complex context in which the sector operates by bringing together multidisciplinary and multistakeholder perspectives
- strengthen the mining and metals community by providing a non-threatening context in which diverse stakeholders with conflicting worldviews are encouraged to share their perspectives and develop mutual understanding, and
- provide useful tools to improve strategic decision-making, and identify strategies for collaborative action.

The scenarios presented in this report have been developed and selected by the participants of the project through numerous discussions and face-to-face and virtual workshops. They represent for those involved stories about their future context that are relevant, plausible, challenging and divergent. Moving forward in a multistakeholder setting, we propose to use these scenarios as a basis for collaborative work that will develop strategic options to contribute to the sustainability of the global mining and metals sector in economic, social and environmental terms.

We hope these scenarios will challenge your thinking, test established wisdom, and stimulate your imagination. As Marcel Proust puts it, “The real voyage of discovery consists not in seeking new landscapes but in having new eyes.”



Robert Greenhill

*Managing Director, Chief Business Officer
World Economic Forum*

Section

1

Developing and Using the Scenarios

Section

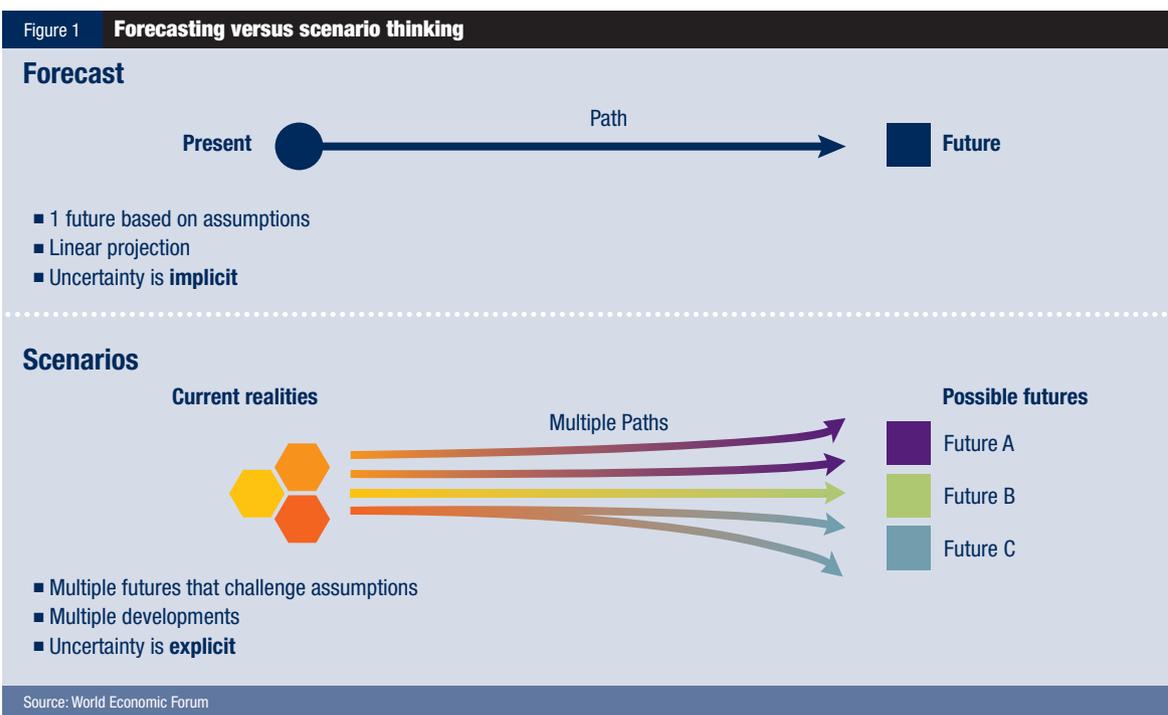
1 Developing and Using the Scenarios

The Mining & Metals Scenarios to 2030 project uses a scenario planning methodology that is primarily qualitative in nature. The Forum’s approach to scenario development focuses on the importance of generating meaningful discussions and challenging insights from a broad set of interdisciplinary and multistakeholder participants.

What are scenarios?

Scenarios are stories about the future. Good scenarios are plausible, challenging and rigorously constructed to address the most critical questions that decision-makers need to face. They represent stories about the future context that are relevant, plausible, challenging and divergent.

One cannot expect any given scenario to come true as it stands. They are not predictions, preferences or forecasts (Figure 1). Rather the process of developing and using scenarios is intended to help participants learn and generate insights, both from exploring each scenario individually and from comparing and contrasting them.



How can scenarios be used?

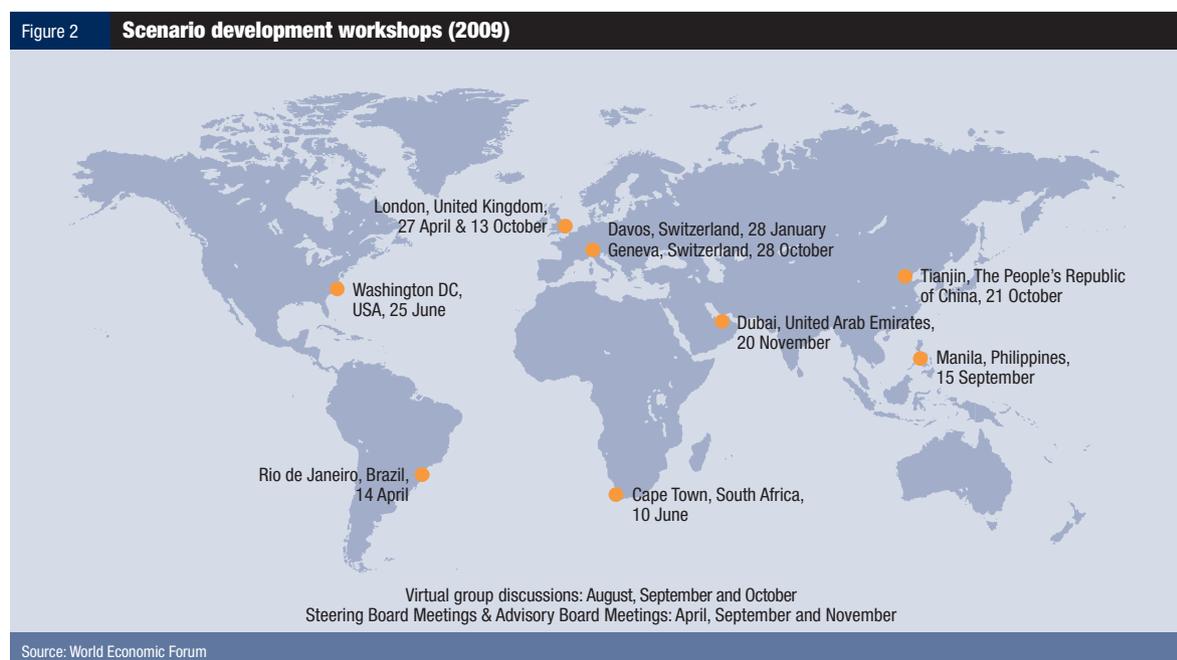
Scenario thinking is a powerful strategic management tool that can be used in the private, public and non-profit sectors as well as in a multistakeholder context. While scenarios are often used to provide decision-makers with tools to anticipate potential hazards, they have also proven to be a powerful tool for creating opportunities – in the form of new businesses, new markets and the forging of new connections – by freeing thought from the constraints of the past.

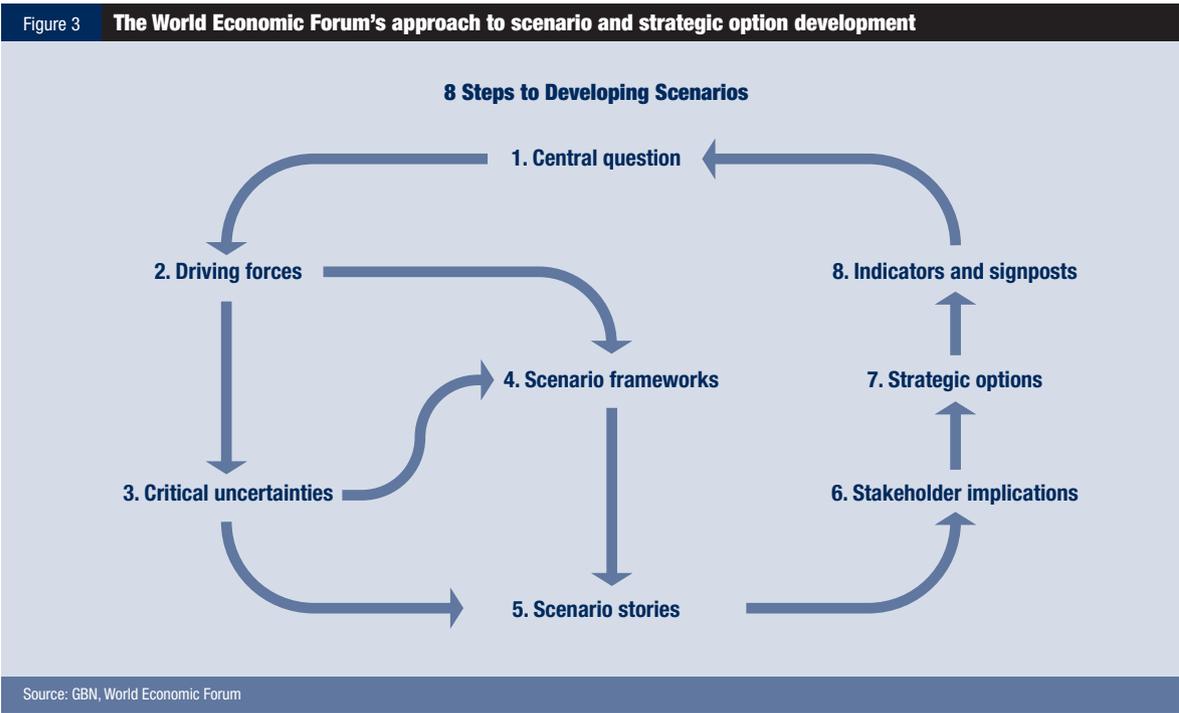
Scenarios can enrich learning as well as decision-making at both the organizational and individual level. In particular, they provide leaders with the ability to:

- **Enhance a strategy's robustness** by identifying and challenging underlying assumptions and established wisdom
- **Make better strategic decisions** by discovering and framing uncertainties, leading to a more informed understanding of the risks involved with substantial and irreversible commitments, and contributing to strong and pre-emptive organizational positioning
- **Improve awareness of change** by shedding light on the complex interplay of underlying drivers and critical uncertainties, and enhancing sensitivity to weak and early signals of significant changes ahead
- **Increase preparedness and agility** for coping with the unexpected by making it possible to visualize possible futures and mentally rehearse responses
- **Facilitate mutual understanding and collaborative action** by providing different stakeholders with common languages and concepts in a non-threatening context, thereby opening the space for creating robust, effective and innovative multistakeholder strategic options.

How have the Mining & Metals Scenarios to 2030 been developed?

The Mining & Metals Scenarios to 2030 have been developed through a year-long process which has brought together over 200 stakeholders from the private sector, government, academia and international and non-governmental organizations in numerous discussions and face-to-face and virtual workshops (Figure 2). These used the World Economic Forum's approach to developing scenarios and strategic options, as shown in Figure 3.





Section **2** Introduction

Section 2 Introduction

During the last year, stakeholders in the Mining & Metals Scenario to 2030 project have developed the scenarios depicted in this report by working through the first five steps of the World Economic Forum's eight-step approach to scenario and strategic option development (Figure 3).

Step one: Formulating the central question

Through discussion with constituents in the mining and metals sector, the project formulated the following central question to be considered through scenario planning methodology: "How will the environment for the global mining and metals sector look in 2030?"

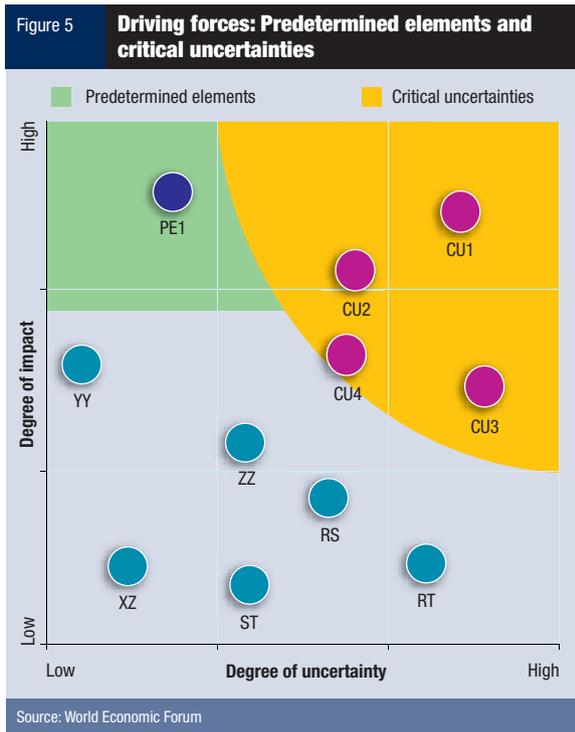
Steps two and three: Identifying driving forces and determining critical uncertainties

In order to understand how the mining and metals sector might evolve over the next 20 years, it is necessary to identify the social, technological, economic, environmental and geopolitical drivers shaping the environment in which the sector will operate. Over 60 drivers came out of brainstorming sessions and were discussed (Figure 4). Depending on their level of uncertainty, driving forces considered to have the biggest potential impact were then categorised into predetermined elements and critical uncertainties (Figure 5). The drivers that were deemed to have less impact on the sector were not used to create the scenarios, but in many cases come out within the stories.

Figure 4 **Examples of drivers (non-exhaustive)**

SOCIAL	TECHNOLOGICAL	ECONOMIC	ENVIRONMENTAL	(GEO)POLITICAL
<ul style="list-style-type: none"> • CSR expectations • Income inequality • Population growth • Consumer behaviour • Indigenous expectations • Skills gap • Health and safety expectations 	<ul style="list-style-type: none"> • Automation of operations • Substitutions for minerals • Energy innovation • Resource scarcity • Low carbon technologies • New uses for materials 	<ul style="list-style-type: none"> • Global economic growth • Emerging middle classes • Developmental states of economies • Access to capital • Financial openness • Global wealth distribution • Fiscal policy • Form of capitalism 	<ul style="list-style-type: none"> • Climate change policy • Water availability • Effects of climate change / environmental degradation • Price of CO₂ • Price of water • Global industry adaptation of environmental standards • Ecosystem valuation • Biodiversity regulation 	<ul style="list-style-type: none"> • Geopolitical instability • Level of state intervention in business • Degree of trade liberalisation • Resource nationalism • Resource management • Protectionism • Energy security policy • Corruption • Global governance • Quality of public governance • Geopolitical power shifts

Source: World Economic Forum



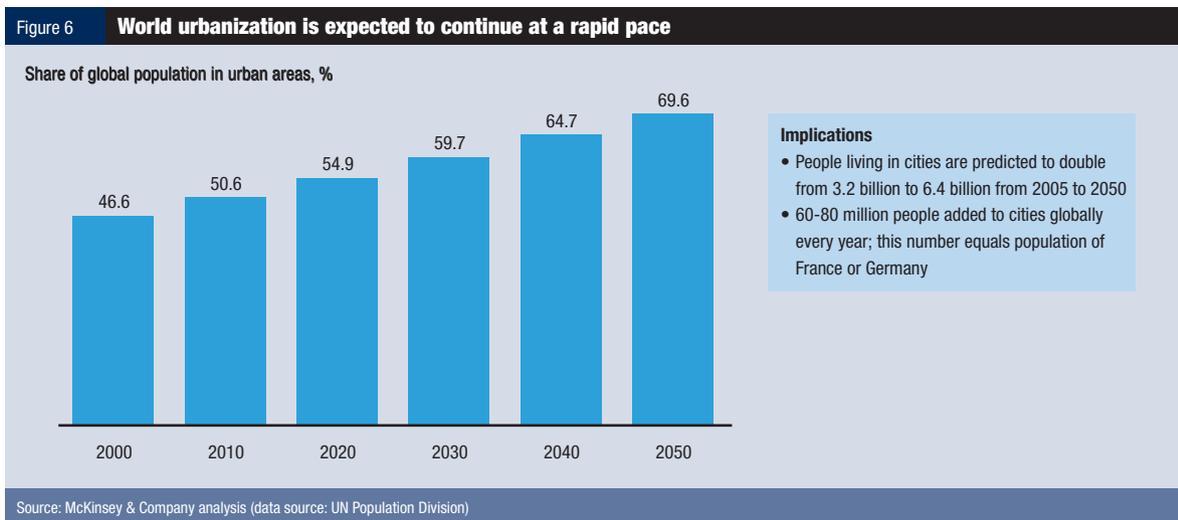
Predetermined elements

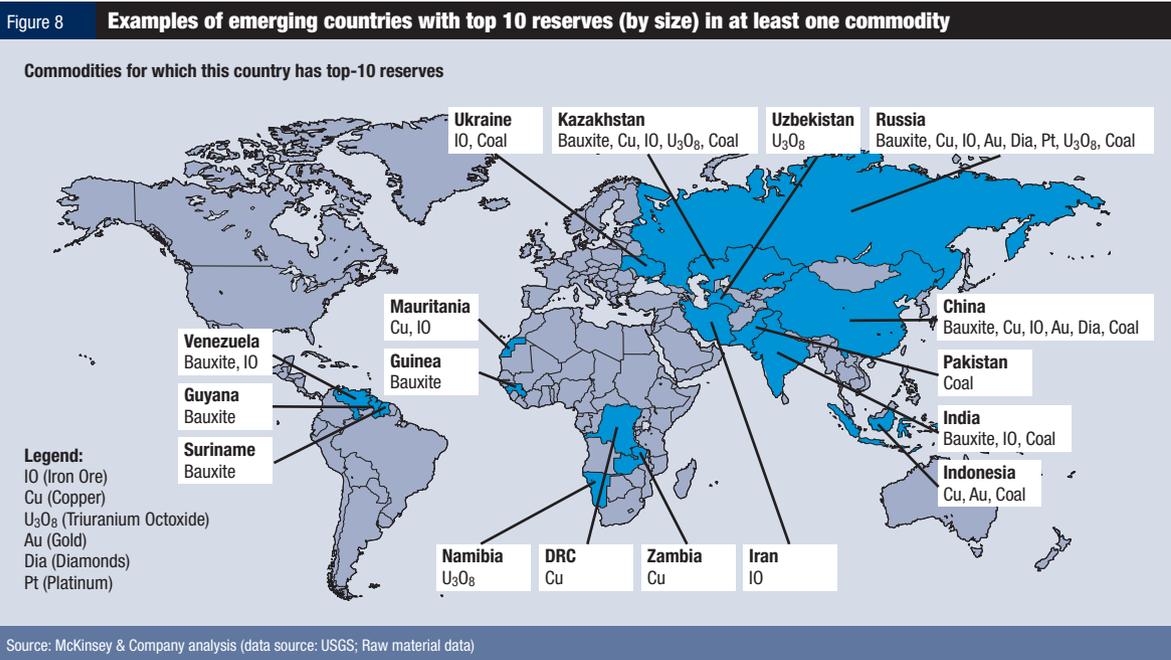
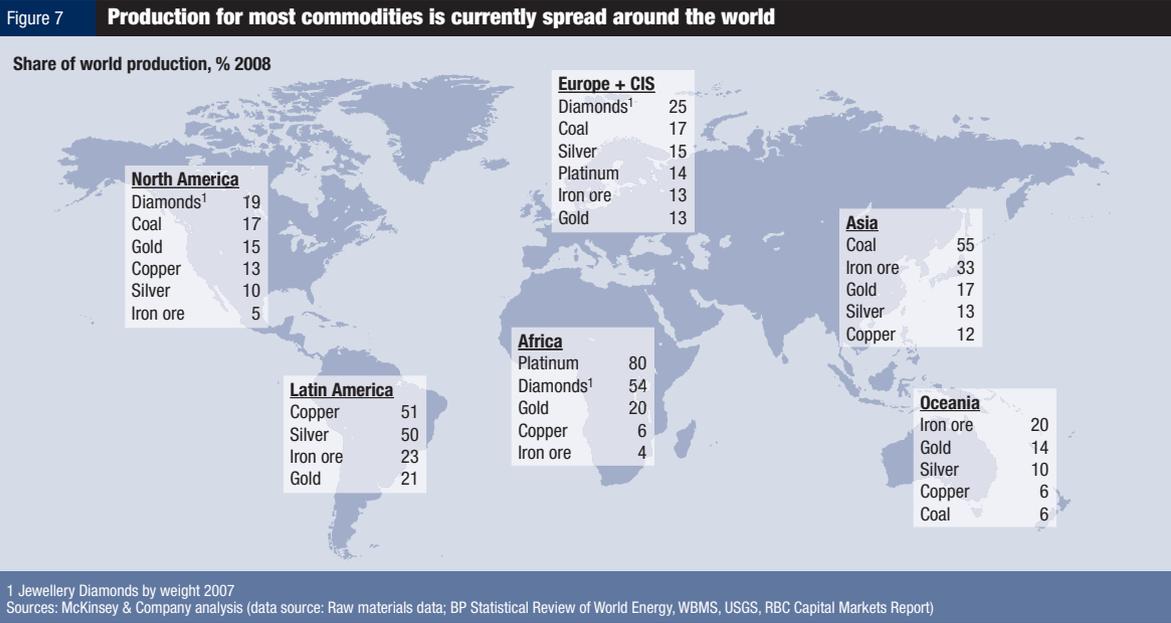
Population growth, continued urbanization and industrialization, and the challenge of meeting global demand for some commodities are generally agreed to be relatively predictable in their evolution while at the same time are expected to play a key role in shaping the future context for the mining and metals sector.

Global population growth – together with upward trends in urbanization and industrialization, particularly in emerging economies – has led to a strong increase in demand for commodities from the mining and metals industries. This growth is highly likely to continue. The number of people living in cities, and consuming a higher share of resources, could double to 6.4 billion (Figure 6). This growth will continue to place pressure on the demand for resources.

The challenge for supply to meet demand for some commodities is a result of the depletion of current reserves at a time when replenishment is becoming increasingly difficult. For most commodities, the primary

reserves are not located in the same places that generate most of the demand. Additionally, many known reserves slated for future exploration are located in developing regions where the political climate may be unstable and a lack of infrastructure may pose challenges for extraction, processing and transportation (Figure 7 and Figure 8).





Critical uncertainties

Drivers that have significant impact and are highly uncertain are called “critical uncertainties.” These are used to build the scenario frameworks and shape the differences between the scenario stories. Reflecting on the future of the mining and metals sector in 2030, eight critical uncertainties were identified where the range of possible outcomes is wide and their impact on the sector is significant. They have been categorized into four areas: geo-economic landscape, geopolitical landscape, economic outlook and environmental outlook.

Geo-economic landscape

This dimension looks at where economic power will be by 2030 and how markets will operate.

- ***Will Asia dominate the geo-economic landscape or will economic power be spread across regions?***
There is a general consensus that economic power is shifting to Asia, particularly China. However, looking forward 20 years, the rate of this change is less clear.
- ***Will cross-border flows be more open or more closed?*** Cross-border flows are defined as goods, services, human resources, capital, technology and intellectual property. Over the last decade cross-border flows have become more fluid, yet protectionist voices are emerging with greater strength.
- ***Will markets be free or controlled?*** The extent to which by 2030 governments might intervene to regulate markets and decide upon the use of resources is highly uncertain. At a global level, it is unclear whether the free market paradigm or the controlled-market paradigm will prevail.

Geopolitical landscape

This dimension refers to stability within or across countries.

- ***Will the geopolitical landscape be stable or unstable?*** Stability is defined not only by war and conflict, but also by consistency in political decision-making (foreign policy, trade and other policies) and adherence to the rule of law.
- ***Will there be ideological convergence or divergence between regions?***

Economic outlook

Given the recent economic downturn, this area is top of mind for many in the sector.

- ***Will change be more predictably cyclical or more extreme and unpredictable?*** In general, the mining and metals industry is considered cyclical; however, there is a chance that the economy will become extremely volatile, resulting in unpredictability.
- ***Will average global GDP grow rapidly or stagnate?***

Environmental outlook

This dimension looks at the nature and extent of the actions that society and policy-makers will take in the light of climate change.

- ***Will the response to climate change be decisive and ambitious or reactive and incremental?***

Technological uncertainty

Broadly speaking, the experts whose views contributed to these scenarios did not anticipate by 2030 any technological breakthroughs that would transform key aspects of the industry such as operations, metals and mineral use or energy technologies. Therefore no specific technological innovation was applied as a driver for developing the scenario frameworks. Rather, the scenario stories provide a basis for reflecting on how various innovations and the adoption of specific technologies could affect the sector in each of the different contexts.

Step four: Constructing scenario frameworks

Using an inductive scenario-building approach, project participants explored challenging combinations of a large number of critical uncertainties. While many other scenarios are plausible, the three depicted here were selected because they represent for those involved stories about their future context that are relevant, challenging and divergent.

Figure 9 expresses how the scenarios are structured using the four dimensions of critical uncertainty discussed above, with extreme outcomes represented by the ends of each spectrum.

Step five: Developing scenario stories

Over the course of numerous workshops and interviews, the frameworks were developed into three distinct scenario stories, which are presented in the following three chapters.

While some elements of the stories may strike you as unrealistic at first glance, we ask you to recall that 2030 lies 20 years in the future. Take a moment to think back 20 years to 1990, and consider the range of rapid and often surprising developments that occurred since then: for example, the massive changes in communication technology, the shift in attitudes towards security, fundamental changes in geopolitics, the strong financial performance of equity markets in the 1990s and the later reversals, the trend towards individualism in many countries, and the rise of China.

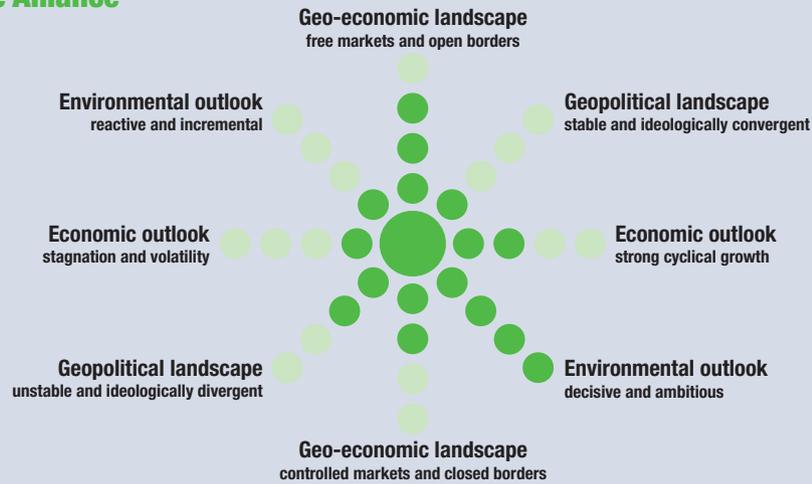
Inevitably, the next two decades will bring a new range of surprises. Hopefully these stories will help you anticipate some of the possibilities. More importantly, we hope they will inspire you to be a proactive partner in shaping a sustainable mining and metals sector.

The scenario publication is complemented by a video which can be viewed on our website:

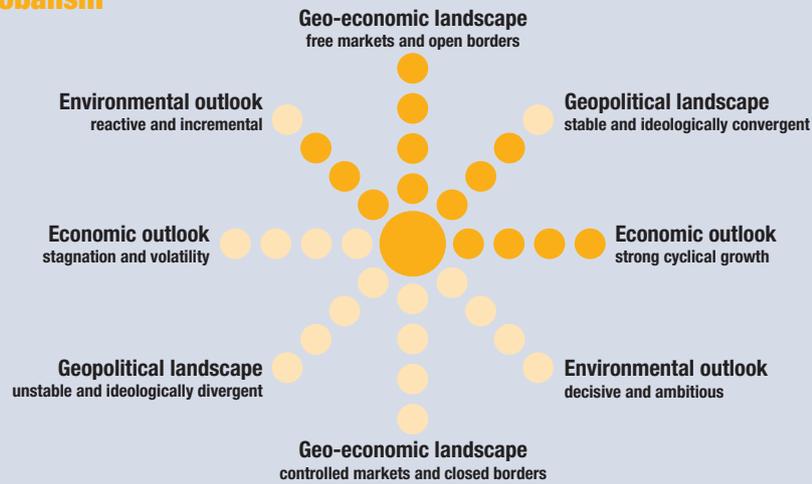
www.weforum.org/scenarios

Figure 9 Scenario structures

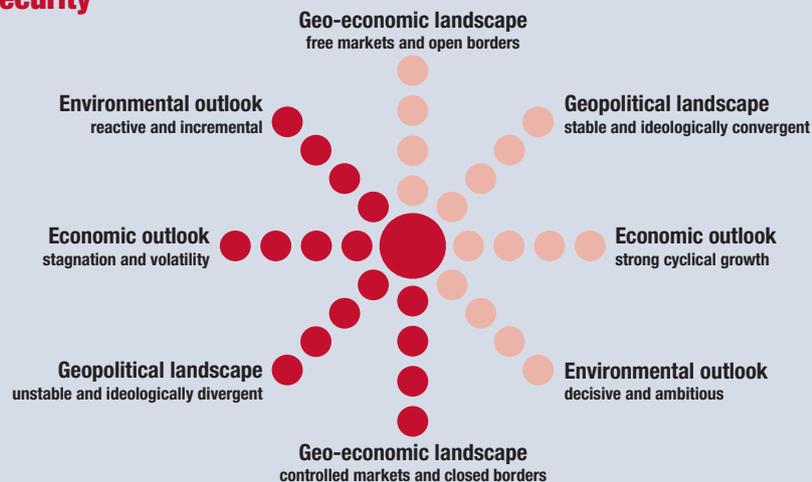
Green Trade Alliance



Rebased Globalism



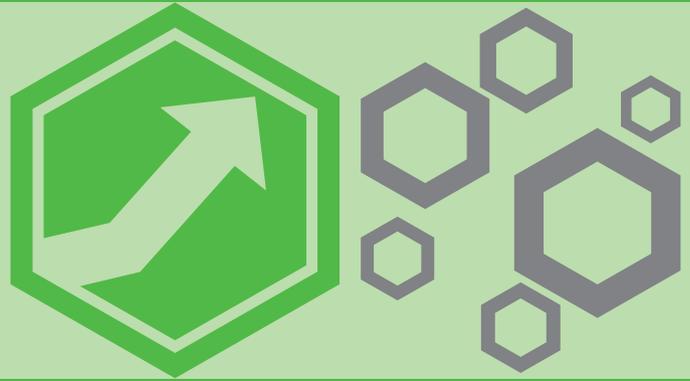
Resource Security



Section

3

Green Trade Alliance



3 Green Trade Alliance



**Public Engagement Office
GTA Secretariat
Prague**

To: **GTA heads of state and representatives**

Date: 27 January 2030

Status: Confidential

Green Trade Alliance www.gta.int – An alliance of countries united by a common vision:

“Environmental sustainability without compromising competitiveness.”

Media Brief for GTA heads of state and representatives – Cape Town Summit

Forthcoming negotiations on Chile’s application for full membership in the Green Trade Alliance (GTA) will prompt interest in the media regarding the GTA’s history, status and future as well as the potential benefits for Chile specifically. Considering the benefits of delivering a consistent message during interactions with the media, the GTA Public Engagement Office has produced this briefing note of key points for heads of state and representatives.

I. Vision and economic success

1. The Secretariat believes the GTA does not receive the credit it deserves for its contribution to the steady and sustained economic recovery. It should be recalled that the GTA’s creation in 2016 followed a highly challenging decade in economic terms. Financial stimulus packages had helped the global economy to emerge from recession but GDP growth remained very slow in the early 2010s, averaging only 1.5% globally and ranging from 0 to 1% in most developed economies.
2. As the economic recovery failed to gain momentum and the employment crisis persisted, demands throughout the EU calling for “real jobs” to be created in the manufacturing sector became increasingly vocal. At the same time a series of freak weather events, which media commentators linked to climate change, fuelled public debate about the sustainability of the resource-intensive lifestyles then prevalent in industrialized countries. EU leaders responded by launching a comprehensive review of their overall long-term growth strategy, which concluded in 2015 with the commitment at the Berlin Strategy Summit to a new focus on “green growth.”
3. The Berlin Strategy paved the way for the GTA’s creation. It stressed policies such as reallocating subsidies from fossil fuels and agriculture towards the promotion of green industries. The Berlin Strategy also formalized the definition of the GDP+ economic metric now widely accepted across the GTA. GDP+ improves on the simplistic definition of GDP by incorporating measures of environmental impact, economic sustainability for future generations and social indicators such as employment.
4. It also became apparent that the new green jobs needed protection from unfair competition from other states with less responsible standards. Meanwhile, the “green growth” movement attracted interest and support in other countries, most notably the United States. The EU therefore reached out initially to the US, Canada and Mexico to form the Green Trade Alliance. The vision statement adopted by EU leaders at the Berlin Strategy – “environmental sustainability without compromising competitiveness” – became the motto of the GTA.





5. The early years of the GTA were predictably difficult. Previous trade relationships, disrupted by the new green trade incentives and barriers, took time to settle into new patterns. New technologies and lifestyle changes encouraged by GTA regulations emerged only gradually. Unsurprisingly, therefore, many non-GTA countries saw faster GDP growth at first. But more recently their economic progress has been challenged by water and energy constraints, while the GTA's growth is steady and sustainable. Even using the outmoded GDP metric, which shows global growth averaging 2% since the GTA's formation, the GTA's performance has been increasingly positive.

II. Contribution to global geopolitical stability

6. Before the GTA, international governance institutions had played a more significant role on the world stage, and the GTA is sometimes held responsible for their increasing irrelevance and disuse. However, it is important to note that the GTA's determined trade stance has not undone the progress made by earlier globalization towards geopolitical stability. While disputes recur, most recently between the GTA and China over competition for Brazilian resources, the global geopolitical situation is relatively stable overall.

7. In fact the GTA's creation was not a cause of but a response to the inadequacy of global institutions to tackle global concerns effectively, a fact that had become increasingly apparent. When the GTA was formed in 2016, for example, the World Trade Organization had already shown to be incapable of successfully mediating the growing number of trade disputes, especially those between China and Western powers.

8. The GTA deserves credit for recognizing that the WTO's global mission was unsustainable and for creating the Sustainable Trade Organization (STO) to play a similar role among GTA member states. The STO has been highly effective in building local capacity for monitoring and enforcement of increasingly strict sanctions to ensure compliance with GTA standards and significantly reducing illicit trade. It has also brokered the gradual but substantial and ongoing expansion in the range of economic sectors covered by GTA agreements.

9. Unfortunately some non-GTA states have retreated from commitments made to environmental and ethical standards through international institutions as those entities were phased out and profitable opportunities to obtain resources in a less responsible manner became available outside the GTA. However, it would be unfair to hold the GTA responsible for this. Furthermore, it must be stressed that not all non-GTA states have acted irresponsibly. Notably, China has made incremental progress towards raising its environmental standards in order to overcome impediments to economic growth.

III. Innovation

10. Media commentators often take for granted the radical changes in technologies, lifestyles and business models that have occurred in GTA member states. They forget that only two decades ago, for example, cars were made mostly from steel and fuelled by petrol; coal was an important part of the energy mix; and many metals that could have been recycled were not.

11. The important changes that have taken place vindicate the GTA's core principle of setting targets while leaving it to individual states to choose how to meet them. As anticipated by the GTA's founders, this strategy spurred innovation in national and local policies, ranging from new regulations and government procurement standards to targeted taxes and carbon pricing schemes. Along with factors related to the materials themselves, especially their availability and cost, these creative policies have reshaped demand patterns and sparked innovations in the use and reuse of resources.

12. Advanced "cradle to cradle" metals and minerals stewardship has allowed decision-makers to make increasingly well-informed trade-offs, basing decisions about resource use on a product's footprint along the value chain throughout its life cycle. This has enabled the development of more sophisticated incentives, leading to numerous major advances in GTA states:



- Businesses have become more eco-efficient, lowering their footprints in terms of CO₂ emissions, water use, waste management and the disposal of toxins;
- End products have become more efficient in their use of minerals and metals, as businesses think holistically about their design and production;
- Through new business models and consumer engagement, businesses and governments have shifted their way of thinking about how to meet demand. For example, leasing has become increasingly popular, with metals companies leasing metals for their use in end-products and consumers leasing the end-products, giving manufacturers a reason to think about the product life cycle;
- Distributors have greatly influenced consumption patterns by considering a product's environmental footprint when deciding whether to distribute it.

13. The GTA is playing an ever greater role as a global leader in technology and innovation. Long-term strategies like the US education reform, adding sustainability in high school curricula and encouraging university students to major in Sustainable Engineering, are producing results. GTA regulations which make it easier to transfer technology and knowledge among member states are boosting trade among GTA states. And the GTA's negotiating strength is forcing a "trickle down" effect of green practices. Exclusion from the Green Intellectual Property Sharing Agreement (GIPSA) is often cited by politicians and commentators in non-member states as a major impediment to their social and economic development.

IV. Benefits for developing and emerging economies

14. The GTA has often faced scepticism from politicians in emerging and developing countries. Especially in its early period, many opted to pursue growth-focused "no ties" investment from capital-rich non-GTA states rather than accept the new requirements to continue to qualify for investment and aid from GTA member states.

15. However, GTA membership has become increasingly attractive to emerging and developing countries. After Russia and Australia joined the GTA in 2019 as expected, many were surprised when Guinea applied for GTA membership in 2022. That nation wanted to invest in better standards in its bauxite operations to avoid the higher GTA tariffs that were due to come into effect in 2025.

16. Guinea's experience has demonstrated how full GTA membership can bring to a developing economy the benefits of responsible investment and donor engagement and succeed in building high quality infrastructure that will be sustainable in the long-term. For other countries, GTA membership has benefited key industries – one notable example is the manufacturing sector in Mexico – as trade barriers reduced competition from low-cost countries.

17. It should also be emphasized that fundamental components of the GTA vision, such as small-scale energy distribution, renewables and energy efficiency, resonate with the people of many developing nations.

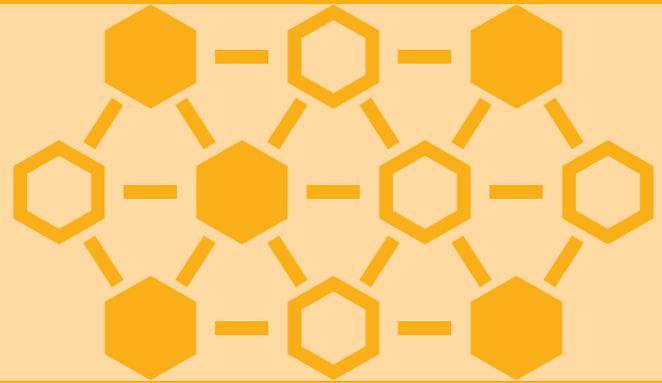
V. Chile's application for full GTA membership

18. Chile has cooperated with the GTA for a number of years, primarily on improving standards in the copper industry and other designated "key resources" as GTA's Key Resource Certification Criteria for copper imports have become gradually more demanding. As Chile now substantially meets GTA criteria across numerous sectors, the prospect of full membership has become more attractive.

19. GTA membership offers Chile the opportunity to protect its own markets and gain access to both GTA markets while obtaining new technology protected by GIPSA. The task of negotiators will be to allay concerns in Chile about the likely extent of retaliatory trade measures from non-GTA states by emphasizing the benefits of GTA status.

Section

4 Rebased Globalism



Section 4 Rebased Globalism



India Global Network
21.30 Indian Standard Time, 10 February 2030

DeepDive on changing global trends in the resource extraction industry

presented by Rumeli Kaur



Hello and welcome to DeepDive on the India Global Network – world news and analysis from New Delhi, broadcasting 24/7 around the globe. I'm Rumeli Kaur. On the programme tonight, we deep dive into changing global trends in the resource extraction industry. Our guests tonight are Ana Fuenmayor, a senior sector analyst at LatAmInvest; Jin Pengfei, recently retired CEO of the China Global Mining Corporation; and Eyong Bedimo, visiting professor of Sociology at the University of Africa in Luanda. Good evening to you all.

Ms Fuenmayor, let us start with you. On your corporate blog this week, you noted it is 20 years since you began your career as an investment analyst, and you took the opportunity to reflect on two big power shifts you have seen in that time that you say have profoundly altered the operating environment for resource extraction industries. Tell us, what are those shifts in power?



Hello, Rumeli. Well, the first power shift I talked about in my blog post is the move in political and economic influence, away from the powers of the last century in Europe and North America, and towards the more multipolar globalism we see today. Now there are more political and economic centres of gravity and an ever more complex web of interests to be balanced and tensions to be managed. The second is the shift in power in the society at large. We've seen communities become much more agile and sophisticated in harnessing the tools of technology to communicate and mobilise both locally and globally. Not only companies but also investors must take social responsibility seriously. If we, here in Rio de Janeiro, invest in an Indian company which has a mine in Suriname, and that company fails to respect laws adopted by the district government after a campaign by local people, our investors find out, and we feel the heat from that. Naturally, here at LatAmInvest we pride ourselves on our ethical investment standards. The combined effect of these two shifts has been that today's globalization looks very different from globalization when I started my career with LatAmInvest in 2010. The overall commitment to internationalism and market principles is still strong, and communications technology has bound us all ever more tightly together. But global governance institutions have become too cumbersome to work effectively. Especially after the formalization of the G42, there are too many powerful voices in the debate.

So instead of comprehensive agreements on standards and rules, you have many agreements among smaller groups of countries or bilaterally. The environmental and social standards in international law are far weaker than many local regulatory frameworks, often passed in response to pressure from civil society organizations.

Have your say
tweetback@IGN.in

What do you think of today's DeepDive topic? We publish selections of your online conversation here in real time.

[Lisa_Melbourne](#)

Ask your interviewee from LatAmInvest why they have still not divested their stake in World Mining Enterprises, despite the Inchiri regional court ruling against it in Mauritania? Shame on LatAmInvest!

[Sagarika_Kolkata](#)

How crazy that we are even talking about resource extraction. We should be investing only in renewables. Does nobody care anymore that we are destroying the planet?

[Oyunbileg_Ulaan_Baata](#)

Communities are more powerful now, are you kidding? Have you seen the latest GINI coefficients? The rich get richer, the poor only pick up the crumbs.

[Miguel_Santoro_Rio_de_Janeiro](#)

Lisa in Melbourne, please be assured that LatAmInvest is actively engaging with World Mining Enterprises to resolve satisfactorily the situation in Mauritania.



Any corporation operating internationally has to take local rules very seriously indeed. Back in 2010, only the big Western companies worried seriously about reputational risk. Now everyone is. They have to be.



Let me turn now to our Beijing studio. Jin Pengfei, until last month you were CEO of the China Global Mining Corporation, now the third biggest in the world. Jin Pengfei, do you concur with Ms Fuenmayor's analysis?



Let me correct you, Rumeli, we are actually now the second biggest. Incidentally, seven of the top 10 global mining corporations now are majority-owned in China, India or Brazil. This amply demonstrates Ms Fuenmayor's point about shifts in economic power. Companies from the emerged economies are now global market leaders in this sector. But I want to pick up on this point about reputational risk and the increasingly global reach of local civil society. As my country liberalised and privatised, and my company worked more in overseas operations, we indeed found ourselves being held strongly to account for how well we shaped up to various local regulations, some of which were quite onerous.

I am proud of how China Global Mining Corporation has become a leader in engaging with local communities in a transparent manner – a leader not only among Chinese companies but in the world. We are a responsible company and we welcome honest scrutiny. But I must add that, at times, the power of civil society is open to question. The law passed last year in Ms Fuenmayor's country, Brazil, is a case in point. To tax all corporate revenues of companies using Brazilian natural resources, and use the money for a general national social development fund, can arguably be seen as going beyond linking responsible mining companies with the local communities where they operate. Some would call it expropriation.



Ms Fuenmayor, would you like to come in here?



Well, Rumeli, it is not up to me to defend this policy of the Brazilian government. My personal view is that it was a knee-jerk reaction. But it does illustrate not only the growing power of civil society in resource-rich countries, but the growing political assertiveness of resource-rich countries themselves. This is perhaps the most unexpected element of the shifts in power of the last couple of decades. You know, anyone could have foreseen that the renminbi would come to rival the dollar and euro as a reserve currency as China inevitably liberalised and privatised its economy, or that more and more commodity trading would take place on the exchanges in emerged economies. What's been more interesting is that we haven't simply seen a switch from old to new centres of power. Instead we've seen resource-rich but relatively capital-poor countries emerge from spheres of influence to become real powers in their own right.

For instance, Latin American countries used to be far more dominated by the US. Mongolia's voice was barely heard above China's. The former Soviet republics used to operate in the shadow of Russia, especially back before Russia liberalised economically and became more integrated into the global marketplace. Such

David_NYC

It's far too late now for renewables to prevent climate change. The only sensible response is to adapt, like with the massive tidal defences we are building in NYC.

Ruslan_Ashgabat

Great news from Turkmenistan, a new law mandates extractive industries to fund improved preschools for local communities. Read about it at tmnews.tm.

Penelope_Mexico_City

David in NYC, how high do you want to build those sea defences? With the Greenland Ice Sheet melting this fast you will still have to relocate the city by 2065.

Obi_Lagos

Some would say expropriating the massive profits of global mining corporations for a social development fund is a very good thing. I applaud the Brazilian congress!



countries are all able to be much more assertive now. Of course this has often been a source of tension and disputes. Many of these countries have been able to work together to diversify their strategic partnerships.

We've also seen many resource-rich countries respond to social pressure to capture more value from resources which previously they had only exported. Many countries have successfully used their resources as a base for developing skills and boosting employment in processing and manufacturing activities. Look at Botswana's diamond industry and the quality of gold jewellery coming out of Venezuela. Or consider how India established itself remarkably quickly as a major smelter of aluminium.

It shouldn't surprise us that geopolitical and geo-economic power now comes almost as much from control of resources as possession of capital. This trend is easily explained by the sustained high demand for commodities, with global GDP growing at an average of 4% a year over the last couple of decades.



Eyong Bedimo, as a professor of Sociology at the University of Africa in Luanda, you have studied the extent to which local communities in resource-rich areas have been able to demand more social and economic benefits and protection of their local environments. How powerful has civil society become?



The situation is better than it was, Rumeli, certainly if you ask me to think back 20 years as Ms Fuenmayor is doing. In particular the capacity of grassroots organizations is greater now – back then, the civil society arena was dominated by big Western NGOs. Communications technology of course is more powerful and widespread. We have seen numerous successes in holding extractive industries to higher standards, particularly through the strategy of targeting banks, institutional investors, sovereign wealth funds and international donor and lending organizations to attach strict conditions to their lending and investment.

But the major problems we are facing now are related to environmental sustainability. Although there have been many successes in protecting local environments from the effects of extractive activities, these have not added up to comprehensive global action on the environment. Because global governance institutions have become too cumbersome to work effectively, as Ms Fuenmayor pointed out, we have had no effective international agreements to tackle climate change. And sadly, that has fed a general sense of public acceptance that it is simply too late to do anything about climate change.

How well we will be able to adapt is very much open to question. There are increasingly tense conflicts between industry and local communities over the use of land – as desertification spreads – and of course water, which is increasingly scarce in many places. Power shortages are affecting industry and communities alike. There is only so much you can save through efficiency, and one can question whether renewable energy is coming on stream quickly enough to prevent serious disruptions. I believe there are increasingly painful choices ahead and I can foresee major social unrest as a result.



Thank you, Professor. That's all we have time for this evening. Stay with us for World Business Desk, and join us tomorrow for another edition of DeepDive.

Jim_London

It is true that the GINI coefficients are widening, but don't forget we're all becoming better off. Statistics show a continued downward trend of the numbers of people in absolute poverty.

Lomana_DRC

Hello from D. R. Congo, please help our legal campaign to prove a link between one company's copper mine and the pollution of water sources in six villages, see ccwkp.cd.

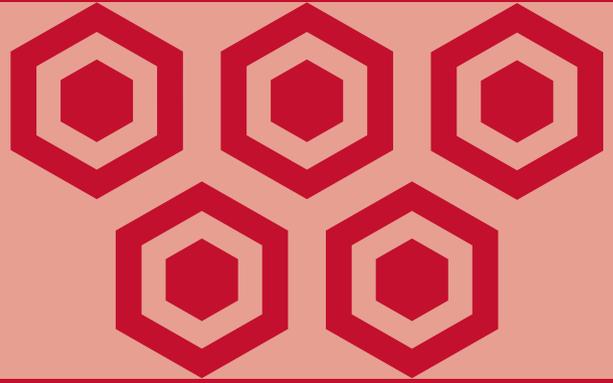
Anon_Moscow

I work for a mining company and I agree that local communities are far more powerful now. Navigating all these local bureaucracies and threats from activists can be a nightmare.

Section

5

Resource Security



Section 5 Resource Security

M A S T E R I N R E S O U R C E P L A N N I N G

National University of Economic Planning

REV: MAY 28, 2030

Global trends in resource security from 2010 to 2030

Economic and political contexts have changed considerably since the Era of Globalization (commonly considered by historians as 1989-2011). Economically, that era was characterised by the twin assumptions that liberalising trade would ultimately work to the benefit of all, and that the mechanisms of the free market would be sufficient to manage transitions as resources became scarcer (Trudeau, 2025). The extent of state intervention, national economic planning and protectionism common today would have been unthinkable.

Politically, the Era of Globalization was characterised by an idealistic commitment to ever-closer international integration, which Johnson (2026) calls “naivety” in *The Return of the Great Game: Neo-Colonialism and Neo-Mercantilism in the 21st Century*. For this “brief interlude in world history” it was seen as “bad form,” Johnson writes, “to pursue national self-interest overtly. The exercise of military and economic power overseas was routinely framed as serving the broader goals of humanity and global development. Today, power is once again exercised not only more aggressively but also more nakedly.”

The process of accessing resources during the Era of Globalization was less straightforward in some ways, and easier in others. Operations were complicated by more serious qualms about environmental and social impacts, which have since come to take a “firm second place to considerations of national interest” (Johnson, 2028). On the other hand, more confident expectations of political and economic stability meant that financing for overseas operations was much easier to raise from private investors – in contrast to the situation nowadays, when most financing for overseas resource exploration and extraction activities comes from national governments motivated by strategic considerations (Matos, 2029).

The end of globalization in the 2010s

The beginning of retrenchment from the ideals of global engagement, as Depta and Liang (2029) write, “was the strengthening recovery at the start of the 2010s. As China, Brazil and India drove global GDP growth back towards 4%, political leaders focused on the seemingly unstoppable development of the emerging economies. They concluded that progress would depend largely on securing access to resources.”

The growing expectation that there could be no end to ever-rising demand for oil, gas and other commodities was crystallised in the public mind by Namita Foss’ 2012 worldwide bestseller *The Crunch is Now: Four Survival Strategies for a World of Resource Scarcity*. Combinations of and interplays between the four types of strategy identified by Foss did, indeed, come to increasingly define geopolitics and economics in the 2010s and 2020s. Foss formulated them as:

- **The Cartel Strategy** This would be pursued by states in relation to reserves of natural resources that exceeded what could conceivably be required for development of their own economies. They should, Foss argued, try to “extract every last ounce of value” for their reserves, by heavily taxing the profits of companies exploiting them for export, or by joining resource blocs to enhance their negotiating power.
- **The Hoarding Strategy** This would be pursued by states in relation to resources for which they saw a need for their own national development. Foss identified the trend for such countries to ban, cap or heavily tax the export of those resources, to give priority for their use for the development of domestic markets.
- **The Colonial Strategy** States without sufficient reserves of a resource they needed, argued Foss, would need to secure that resource from external sources through the use of power – economic, political or military.
- **The Substitution Strategy** Characterised by active industrial policies, and barriers to trade and foreign investment, this strategy would be open to all states and could be pursued in combination with other strategies. Some states would be forced into substitution strategies because they were unable to gain access to or afford to buy necessary imports, Foss argued; others would choose self-reliance for ideological reasons and reduce their dependency on resources unavailable domestically.





Foss' book caught the public imagination as it offered a framework for understanding two pivotal events which occurred shortly after its publication. First, in 2012, Russia, Iran and Qatar sent shockwaves through the European Union by jointly convening a meeting to discuss the “strategic deployment” of natural gas reserves – a meeting which led in 2013 to the creation of the Organization of Natural Gas Exporting Countries (ONGEC). Then, also in 2013, China's new leaders announced their policy of “Chinese resources for Chinese development,” precipitating the final breakdown of already stalled trade negotiations with Western powers and leading to an outright ban on the export of rare earth minerals among other things.

The rise of regionalism and neo-colonial practices

As worries about future access to resources dominated public discourse around the world, the early 2010s saw resurgence in nationalism. Institutions which had characterised the Era of Globalization, such as the United Nations (a forum for discussing politics) and the World Trade Organization (a mediator of trade agreements), faded into irrelevance. Mutual retaliation escalated in the forms of export taxes and restrictions, and a web of protectionist barriers and preferential trade agreements spread. Governments in many countries asserted their need and right to intervene economically in the national self-interest. Commodity prices became highly volatile, further feeding the sense of concern.

Populist political leaders turned to culturally and ideologically compatible trade partners. In 2015 the Americas Alliance for Equity and Prosperity was created by Brazil, Ecuador, Bolivia, Peru, Venezuela and Cuba, with the stated intention of pooling resources to develop their own economies. They agreed taxes on exports of some resources at rates that made them prohibitively expensive for previous trade partners such as China, the US and EU – intensifying, argues Matos (2029), the “second scramble for Africa.”

The Second Scramble for Africa

Few areas have provoked more controversy among scholars in resource security than the “second scramble for Africa,” which in the 2010s and 2020s has seen both the continent's former colonial powers and more newly capital-rich states compete fiercely for Africa's natural resources. Some maintain that Africa has benefited from being the renewed focus of international attention after decades of being mostly ignored; others argue the continent has been exploited. In a new monograph, Wanyoto (2030) concludes that the reality has been a nuanced mixture of benefits and missed opportunities.

On the positive side, Wanyoto points out that the 7% average annual GDP growth recorded by Africa from the period 2010 to 2030 exceeds its performance in the previous half-century. Wanyoto also points to numerous significant improvements in transportation infrastructure around the continent which have accompanied the sharp increases in exports of fuel and mining products. He also highlights the new employment opportunities, especially in the mining sector.

Wanyoto concedes, however, that social and environmental indicators have lagged behind economic performance. Low-skilled jobs are the norm, with foreign mining companies importing skilled labour. Analysis of educational enrolment rates and quality suggests that Africa's human resource capital has been little developed. Health infrastructure has also lagged, with incidences of malaria, HIV/AIDS and child mortality generally on the rise. Resource extraction projects have often been criticised for inadequate safety measures, exacerbating water shortages, polluting local reserves of water, soil and air, and human rights abuses.



It was not only in Africa that “neo-colonies” emerged, but also among the Stans¹, Mongolia and Indonesia. In *The Return of the Great Game: Neo-Colonialism and Neo-Mercantilism in the 21st Century*, Johnson explores the various strategies through which capital-rich states have sought to secure access to resources. These include buying and leasing land, development aid, foreign policy, and condoning and facilitating informal payments between corporations and political leaders. They also extend to covert arms trading with favoured militias and occasional direct military engagement; this has contributed to the growth in global military spending over the last two decades.

Growth slows but conflict grows

Trudeau (2029) points out that the end of the Era of Globalization was marked by rhetoric about the need for measures to safeguard continued GDP growth, but argues that the cumulative effect of these measures was in fact to slow that growth significantly. Trudeau primarily blames the decline in cross-border flows of products, capital and labour for the slowing of global GDP growth to its recent average of around 1.5%.

As economic growth has slowed, the argument that resource security can ensure growth has been undermined. The last few years have seen academic interest in the idea of “reglobalization” percolate into the political realm (Moreno, in press). Especially resonant in the academic reglobalization movement has been Prinku’s 2028 paper *An Analysis of Technological Developments Attributable to Import Substitution Strategies*, which shows how impediments to cross-border flows of knowledge and technology have led to inefficiency and duplicated research efforts.

Import substitution: Weighing the positive and negative effects

The emerging “eco-localist” movement (Johansson, 2027) celebrates advances in green and renewable technologies sparked by quests by some governments for self-sufficiency. Eco-localists point to advances in wave technology in Scandinavia and the “Cleantech Corridor” in Scotland, a hub of state-supported academics and industry researching green building materials and low-carbon transport solutions.

However, in *An Analysis of Technological Developments Attributable to Import Substitution Strategies*, Prinku takes issue with the eco-localist school of thought. She points out that such advances have been slow to spread internationally, and argues that their beneficial environmental effects are more than counterbalanced by the detrimental effects of other substitution strategies elsewhere.

Prinku shows that many substitution strategies represent not innovation but the resurgence of old ideas. For example coals to liquids, increasingly important in many places in the last two decades, can be traced back to wartime economies in the mid-20th century. Even when techniques are recent and considered successful, they have often merely mitigated losses in efficiency compared to the original material, as Prinku shows in a case study of the numerous imperfect attempts in various countries to find substitutes for different uses of cobalt.

Despite some indications of a return to export-led growth strategies, serious reglobalization appears unlikely. Trudeau (2029) argues that the absence of political will in the 2010s to maintain global institutions made the conflicts of the 2020s more intractable. In *The Arctic Hotspot*, she cites the recurring disputes between the United States, Canada, Russia, Greenland and Norway over resources in the Arctic region – ranging from oil, gas and minerals to fish, diamonds and shipping routes – as a notable example of international tension which might have been managed more efficiently in the Era of Globalization.

In a recent journal article, Ndungu (2030) notes that there is little hope for a return to consistent commodity price stability. He writes: “Governments have turned a deaf ear to the protests of local communities about resource extraction activities, often having to step in to deal with abandoned sites and social unrest. As they have cracked down on troublesome interest groups and NGOs, shadowy extremist groups have emerged as the only outlets for protest. Already troublesome phenomena like coup attempts, sovereign default and nationalization appear to be with us for a long time.”

¹ A collective term referring primarily to the Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, and sometimes also including Afghanistan and Pakistan.

Section

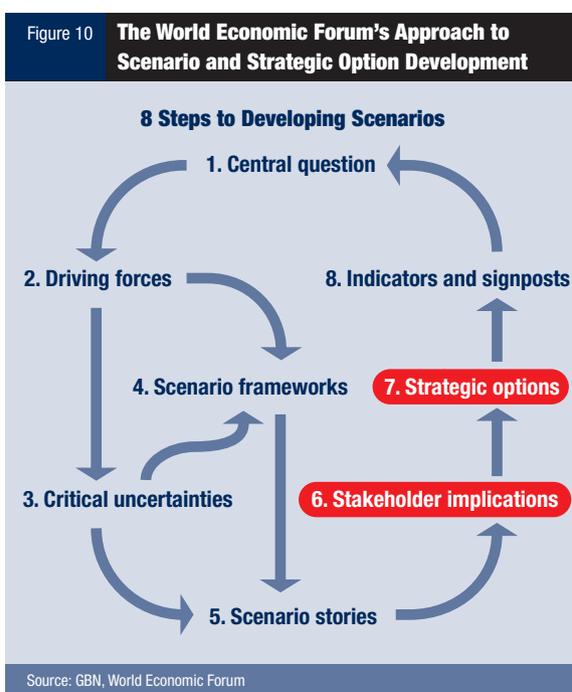
6

From Scenarios to Strategic Options

6 From Scenarios to Strategic Options

Hopefully you found the scenario stories interesting. Do remember that these stories are not ends in themselves. They exist to spur scenario thinking, which can be a powerful tool to stretch your imagination, facilitate debate, generate new strategies and test existing ones. These strategies can then serve as the basis for action.

This document represents the conclusion of the scenario development phase of the Mining & Metals Scenarios to 2030 project. Figure 10 describes the eight-step scenario and strategic option development process used by the World Economic Forum. This phase covers the first 5 steps.



The next two steps, forming the link between the scenarios and the strategic actions on the part of stakeholders, come through considering these questions:

1. **Implications:** What do the scenarios imply in terms of opportunities and challenges?
2. **Strategic options:** What possible actions could be taken to benefit from the opportunities and/or overcome the challenges?

By reflecting on implications, in terms of opportunities and challenges, stakeholders can discuss and create robust multistakeholder strategic options – defined as actions that could be taken to benefit from these opportunities and respond to the challenges – to promote the sustainability of the sector.

Generating useful implications

In a multistakeholder setting, various actors naturally will identify different implications depending on the sector or institutional context in which they operate.

These implications are revealed by asking questions such as:

- How might the scenarios affect my relations with other stakeholders?
- What happens to industry structure, in terms of the economics of demand and supply, as well as the value chain?
- What implications does the regulatory and policy environment have for my organization in this scenario?
- In what new areas could my organization create sustainable competitive advantages in this scenario?
- Who might be new potential partners for value creation in this scenario?
- What kind of competitors or new entrants may emerge in this world?
- Which technologies might become viable and/or mainstream?
- What additional second- or third-order effects stemming from the economic, political, social, environmental or technological drivers might negatively or positively impact my organization?

The answers to these questions are then commonly grouped as “challenges” or “opportunities.” These implications can then act as a starting point for discussions about general and specific strategic options of interest.

Examples of implications that emerged from initial stakeholder discussions

Green Trade Alliance

- Need to determine the incentives that would entice resource-rich countries to join the GTA
- Need to determine the value of non-GDP/indirect benefits of a sustainable development model
- Within the GTA, resource intensive processes and products need to be reviewed
- States and businesses need to review value chains as a result of altered trade flows
- Need for mining and metals companies to review their corporate strategies and the implications for organizational structures
- Need to rethink the areas of competitive advantage for mining and metals companies (e.g. explore life cycle management)
- Potential for mining and metals companies operating in the non-GTA to dismiss sustainable (environmental, socio-economic, governance) practices
- Technological choices will be determined based on the availability of specific materials

Rebased Globalism

- Establishment of a "level playing field"
- Blurring of boundaries between the responsibilities of stakeholders
- Longer timeline for resource development due to more in-depth engagement with stakeholders
- Challenge for companies to navigate simultaneously global and local market conditions
- Trade-off between efficiency and social issues (for example, automation versus job creation)
- Need to manage increased operating costs as inputs such as energy and water become more expensive

Resource Security

- Significant substitution for products, minerals, metals and other resources
- Diversification of domestic manufacturing industries
- International mining exploration and operations face economic challenges, bankruptcies, and possible nationalization
- Negative effect on wider economic development due to abandoned mining activities

Generating strategic options

Using the scenarios and their implications, the stakeholders can then reflect on the collaborative approaches they may take to contribute to the sustainability of the global mining and metals sector – in economic, social and environmental terms. A specific focus can be put on selected options which are deemed to be the most effective and the most innovative or undervalued.

Opportunity for country deep dives

In addition to the actions above, the scenarios also provide for an opportunity to take a country-specific focus. These strategic discussions can aim at helping the country's mining and metals stakeholders reflect on the implications of the global scenarios to their context. Using the lessons from these plausible future global contexts, stakeholders can discuss strategic options related to resource management policy to optimize the sustainability of the country's mining and metals sector.

Section

7

How to Use these Scenarios in Your Organization

Section

7

How to Use these Scenarios in Your Organization

Beyond the World Economic Forum and the multistakeholder context, these scenarios can also serve as a useful tool in strategic decision-making within your organization. The following points suggest some practical ways to translate the scenario process into action within your organization.

1. Strategic decision-taking

Use scenarios to evaluate the resilience and vulnerability of different options regarding specific strategic decisions (for example, a business development option or large investment). In this case the need to take a decision is known beforehand, and the aim is to assess the resilience of the various possible options in different business conditions. The main steps are:

- Identify the key criteria the business environment would have to meet in the future to support a preference for one option over another (for example, growth rate, technological development, regulatory environment, etc.)
- Assess the state of these criteria or conditions in each scenario to decide on the overall consequences of each possible decision
- Ascertain which possible decision would be best in each scenario, and which would be most likely to succeed across the different scenarios
- Consider how each possible option might be hedged or modified in some way to increase its resilience

2. Strategy evaluation

Use scenarios to evaluate the viability of an existing strategy and to identify any need for modifications and/or contingency plans. The main steps are:

- Identify specific elements of the strategy and spell out its goals and objectives
- Assess the likely success of the strategy to meet its objectives in each scenario
- Based on this analysis, identify opportunities addressed or missed, risks foreseen or overlooked, and comparative likelihood of competitive success or failure
- Identify options for changes in strategy and the need for contingency planning

Example of a Strategy Evaluation Workshop

Test the robustness of a specific business strategy in the context of the Mining & Metals Scenarios to 2030 – one day workshop

Before the workshop: Clarify objectives, frame the question, gather the right people, assign participants to scenarios and send background reading

During the workshop: Assuming participants are familiar with the scenarios and background reading:

- Disaggregate the current strategy and spell out its goals and objectives (one hour)
- Assess the likelihood of meeting the objectives in the context of each scenario (one hour 30 minutes)
- Identify opportunities addressed or missed and risks in the context of each scenario (one hour)
- Cross-scenarios discussion, recording commonalities and specificities (one hour)
- Identify strategic issues that need to be examined further, options for change in the strategy and contingency plans (one hour)

3. Strategy development

Use scenarios to develop a new strategy. This is probably the most interesting and sophisticated use of scenario planning. The goal is to develop a strategy that is robust enough to deal with wide variations in business conditions across all the scenarios. Here, the main steps are:

- Identify the key elements of a successful strategy (for example, geographic scope, product range, competition, marketing strategy, etc.)
- Analyse each scenario to determine the best setting for each strategy element (i.e. what would be the best corporate strategy for scenario A? For scenario B? etc.)
- Review the scenario-specific settings to determine the most resilient option for each strategy element, and integrate these strategy options into an overall, coordinated business strategy.

A simpler approach involves selecting one of the scenarios as a starting point and focus for strategy development, then using other scenarios to test the strategy's resilience and viability.

4. Exploring additional scenarios

As a tool for organizational and individual learning, other combinations of the critical uncertainties can be used to construct and explore additional plausible yet challenging scenarios. Please see the end of the publication for cards which can be used as supporting material.

Acknowledgements

This publication synthesizes the ideas and contributions of many individuals through workshops, interviews, group calls and research. The project team thanks everyone who took the challenge to think hard about the future for their time, energy and insights. Without their courage, dedication, guidance and support, we would not have been able to successfully develop this project.

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Geo-economic landscape

Geo-economic landscape

Geo-economic landscape

Geo-economic landscape

Geo-economic landscape

Geo-economic landscape

Response to climate change

Response to climate change

**Asia-dominated
geo-economic landscape**

**Economic power
spread across regions**

**More open
cross-border flows**

**More closed
cross-border flows**

Free markets

Controlled markets

**Decisive and ambitious
response to climate change**

**Reactive and incremental
response to climate change**

Economic outlook

Economic outlook

Economic outlook

Economic outlook

Geopolitical landscape

Geopolitical landscape

Geopolitical landscape

Geopolitical landscape

Cyclical volatility

**Extreme and
unpredictable volatility**

Global GDP grows rapidly

Global GDP stagnates

**Stable
geopolitical landscape**

**Unstable
geopolitical landscape**

**Ideological convergence
between regions**

**Ideological divergence
between regions**