

**ADDRESS BY MR TOM BURKE CBE, TO THE
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'RISK, OPPORTUNITY AND SCARCITY'

It is eleven years since I spoke at the very first MCA conference on sustainable development in Newcastle on the other side of this continent. The global mining industry then faced a set of profound challenges. At that time the broad public perception of the industry was that it was dirty, dumb and dangerous. The challenge I then set out was for the mining industry to become, and to be seen to be, clean, clever and careful.

Much has changed since then. The leading companies in the industry globally decided to define their contribution to society's transition to sustainable development. The Global Mining Initiative was launched as a strategic effort to reform the industry's behaviours on safety, the environment, its relations with its host communities and also the way it engaged with other social actors. The International Council on Mining and Metals (ICMM) was set up as a CEO led body to give a global voice to the mining industry.

It would be hard to claim that the industry is no longer dirty, dumb and dangerous in the light of the recent events. The technical brilliance of the rescue of the 33 trapped Chilean miners does not excuse the dangerous

state of the mine. The collapse of a tailings dam in Hungary not only killed nine people but has left a filthy legacy it will take years to clean. Nevertheless, there is also no doubt that the industry is a lot more careful and much cleaner and cleverer than it was a decade ago.

Then, the big challenges to the industry arose from questions society was asking of it. As we go forward into the twenty first century those challenges remain. But they are now being joined by a new set of profound challenges. These challenges are driven by what the mining industry needs from society if it is to be able to continue to make its contribution to the transition to sustainable development.



WHAT SOCIETY IS ASKING
OF MINING ?

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The short answer is stability. Global mining companies make very capital intensive investments in projects with very long lifetimes – typically three or more decades. Where we invest is determined by where we find resources valuable enough to warrant the risk and the

effort. This means we put billions of collars into holes in the ground which we cannot move.

To generate a worthwhile return we need the political and policy context to remain stable over long periods of time. Traditionally we have been able to count on governments to provide this stability. Where it has not been available, we have not invested. But we are now moving from an age of abundance to one of relative scarcity.

This has two important consequences for mining. Increasingly the world class resources that warrant large investments are found increasingly in places where governments are less capable of providing that stability. Also, the economic, social and political pressures that result from an increasingly stressed natural resource base are adding to policy and price volatility. This is creating an increasingly complex and dynamic landscape of risk and opportunity which we must navigate successfully to deliver value to our shareholders.



I have learnt an important lesson from economists. People take you more seriously if you express your thoughts in long and difficult sounding words. Hence the distinction between endogenous and exogenous risks.

Endogenous risks are those which are driven by the activities of mining companies themselves. They are the familiar operational, financial or market risks that we deal with day in and day out. Exogenous risk are those that impact on mining through the actions – or failures to act – of those beyond the business boundary. These are everything from abrupt shifts in legislation to increasingly sophisticated NGO campaigns.

Over the past two decades the mining industry globally has become increasingly well equipped to manage its endogenous risks. Institutional capability has been built, knowledge and skills acquired, management systems constructed. The result has been continuous improvement in performance across a very wide range of metrics. But the same cannot yet be said for the industry's capacity to manage increasingly pressing exogenous risks. As a result the industry is not communicating effectively to governments and other stakeholders what it needs from them if it is to be successful.

Sustainable development brings these issues into sharp focus. There are very few phrases more likely to bring on definitional constipation than 'sustainable development'. But this is rather more than a fashionable arrangement of words. A little history will help.

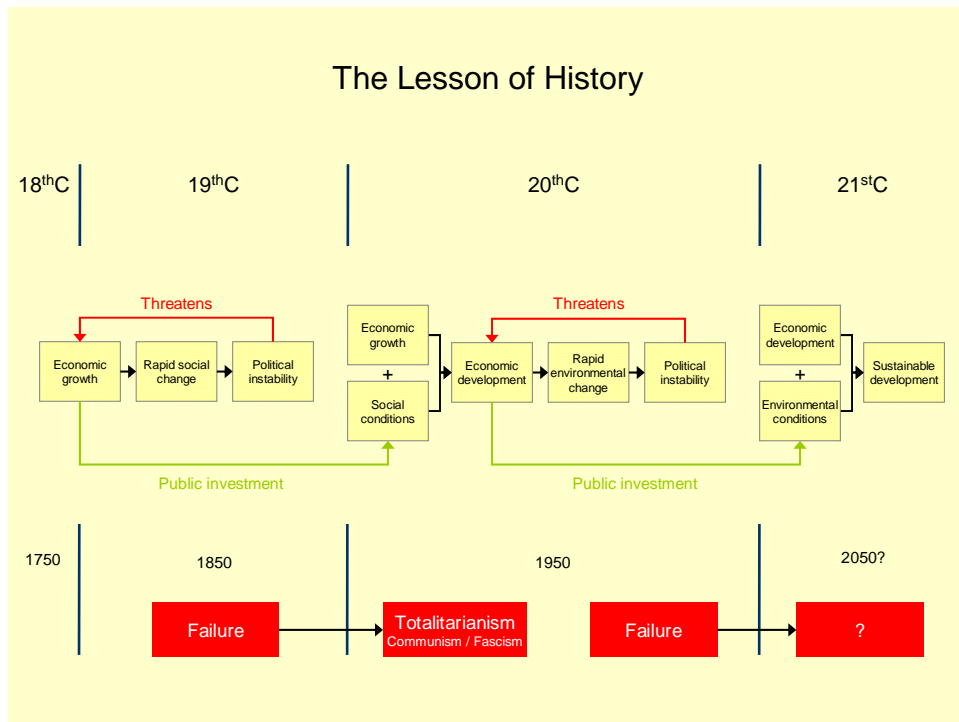
From about the middle of the 18thC. there was a sustained debate, predominantly within Europe, about how to make the economy grow. As the industrial revolution gathered pace under the stimulus of the

Napoleonic wars and the subsequent prolonged period of peace the answer became clear. If individuals are freed to pursue their own self-interest, the interests of all will be enhanced and the economy will grow.

As a formula for increasing economic growth there is no doubt that this argument was correct. As this liberal doctrine gained hold, economies did indeed grow rapidly. But as they grew they let loose an avalanche of change. It soon became apparent that economic growth disrupts social ligatures.

The complex, multi-dimensional relationships of relatively stable communities are replaced in the creative destruction of capitalism by the simpler, transactional relationships of the cash economy. Cultural bonds with their complex patterns of mutual rights and obligations are replaced by economic bonds based simply on the ability to pay. This is undoubtedly more efficient. It is not necessarily more stable.

In the 19th Century rapid economic growth led, then in Europe, as it does now globally, to very rapid social change. This social change, unmediated by any attempt to ameliorate its impacts on the welfare of large numbers of people, led to growing political instability which threatened to undermine the engine of the economic growth driving the change. It is worth recalling that by 1848 Marx had already written the communist manifesto.



In time, the beneficiaries of industrialisation came to realise that to continue reaping the benefits they had to share them. A new debate began about how to maintain the social conditions necessary for growth. The answer that emerged over the next century was that some of the proceeds of economic growth must be invested in maintaining those social conditions.

Institutions, policies and programmes were developed to do just that. Starting with Bismarck in the 1870s the nations of Europe slowly laid the foundations for the culture of solidarity, community and social investment that is modern Europe's greatest strength.

But we learned too late that we needed to invest some of the proceeds of economic growth to maintain the social conditions necessary for it to continue. Our failure to do so in good time let loose the massive tide of social tensions that swept through every country in Europe at the end of the 19th Century. As a consequence we spent the first half of the 20th Century deciding empirically

whether communism or fascism was our preferred form of totalitarianism.

By the middle of the last century there was no longer any argument over the need for nations to invest in health, education and social security in order to underpin their economies. The purpose of public policy expanded from simply facilitating economic growth to promoting economic development, that is, growth plus welfare. The arguments over how much welfare to provide and how best to provide it will continue for a very long time but very few today believe that governments can ensure prosperity without such investment.

As population and prosperity accelerated in the aftermath of the second world war the world entered an era of very rapid economic development. Within two decades a new debate began.

As air and water quality deteriorated, wastes accumulated, the deserts spread, cities sprawled and natural habitats and the plants and animals that lived in them began to disappear, doubts emerged as to whether the planet could continue to provide the resources necessary to maintain the momentum of development. Reinforced by the graphic pictures from space of a blue and white planet alone in the darkness of the universe these growing doubts led to the first of the great global conferences that punctuated the last decades of the 20th Century.

The Stockholm Conference on the Human Environment in 1972 defined for the first time an agenda for action to protect the planet's environment. Over the following thirty years it became increasingly clear that we now needed to invest some of the proceeds of our burgeoning economic

development in maintaining the environmental conditions for that development or it would not occur. In other words, economic development must become sustainable development if prosperity, security and stability are to be ensured in the 21st Century.

There is a more operational way to think about sustainable development. Governments everywhere will try to meet the expectations of their citizens for rising real incomes. When I was born six decades ago there were 2.5 billion people on the planet. Today there are 6.5 billion and by the middle of this century there are likely to be about 9 billion. The challenge is to meet those rising expectations for many more people but to do so without irreversibly undermining the ecological foundations of the economy.

SUSTAINABLE DEVELOPMENT - THE CHALLENGE

- the task is to raise the population of the planet to 9 billion in forty years
- whilst raising real incomes
- without irreversibly undermining the productivity of the 7 ecological systems which provide the foundations of the economy

These are the seven ecological systems that provide every resource in our economy that is not provided by fossil

fuels or non-fossil minerals. They are: croplands, rangelands, forestlands, wetlands, freshwaters, oceans and the atmosphere.

ECOLOGICAL FOUNDATIONS

- croplands
 - rangelands
 - forestlands
 - wetlands
 - freshwaters
 - oceans
 - the atmosphere
-
- \$16 - 54 trillion/year

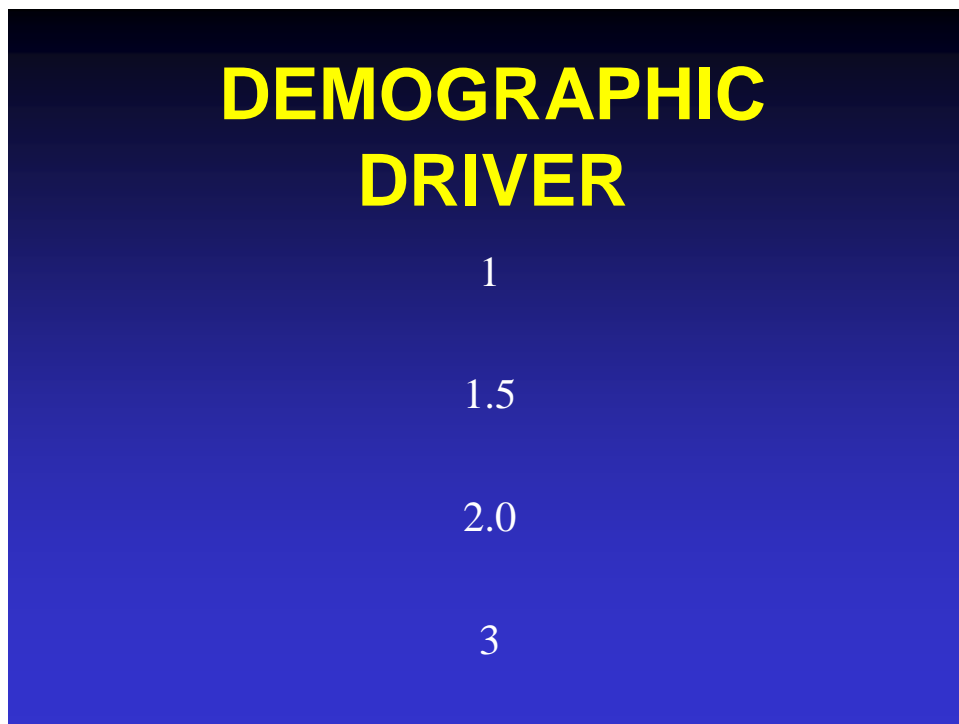
If the productivity of those systems declines, the productivity of the economy as a whole declines. There are many examples in history of cultures which so stressed that productivity that the culture could not survive. But previously we only over- stressed these systems on a local or regional scale. When the cultures collapsed and the people left the systems in many cases recovered, though rarely to their original level of productivity.

Today we are stressing these systems on a global scale. In a famous paper written a few years ago some economists made an estimate of the value of the goods and services provided to the economy by ecosystems. They came to the conclusion that it was somewhere between 16 and 54 trillion dollars a year. Until the bankers taught us otherwise, that seemed like a number too big to

understand. But it does illustrate the scale of un-captured costs we are incurring by continuing to degrade the productivity of these seven systems.

It is difficult to comprehend the scale and momentum of the pressures now building up on them. What we tend to see are the incremental impacts in our immediate locale. We do not see the overall picture. There is no shortage of information. Often, there is too much and all increasingly accessible at the click of a mouse. The problem is making sense of it all.

There are four numbers that I have found helpful in this respect. The interplay between them will shape the politics of this century. It will define the changing landscape of risk and opportunity that governments, businesses, communities and individuals will have to navigate successfully if they are to thrive.



The numbers are: 1, 1.5, 2.0 and 3.0. Let me explain.

The 'one' is the billion or so people who make up the affluent of the world. They live mostly in Europe and North America and the other OECD countries with fast growing pockets of new entrants in China, India, Brazil and the other emerging economies. These are the people who have arrived. They have many assets and secure and relatively high incomes. They are the main drivers and beneficiaries of globalisation. It is also predominantly their success that is responsible for the present state of the global environment.

The 'one point five' are the emerging middle classes in much of the developing world and the less well off in the developed world. They are the new consumers. They have begun to acquire assets and have steady but relatively lower incomes. They are in transition, becoming more affluent, healthier, better educated but they still have some way to go to enjoy the comfort and security of the one billion. Their success is driving the incoming tide of environmental pressure.

The 'two' are the two billion new entrants into the global economy. They have no assets and insecure incomes. They are on the move, making up the economic migrants both within and between countries. Hundreds of millions have moved to the cities in recent decades so that more than half the world's population is now living in the barrios, favelas, townships and their equivalents around the world. They are hanging on by their fingernails to their place in the global economy.

The 'three' are the three billion rural poor. These are the subsistence farmers and herders that have no economically valuable assets and too little cash for it to be reasonably called an income. Most of the billion undernourished people on earth are to be found

among their number. They are the most vulnerable to shocks of any kind – price shocks, storms, droughts, conflict.

It is the aggregate of the choices the individuals in these four groups make – their personal, economic and political choices – that will drive the 21st Century.. These aggregates and the complex interactions between them are the tectonic forces that will shape the landscape of risk and opportunity for business as the century progresses. They will not all be easily captured in conventional economic models. How well governments manage their part in these transformations will determine how possible it will be for companies to navigate them successfully.

These forces are already stressing the pillars of prosperity. That is the energy, food, water and climate security without which civilised life is impossible in any society. In our increasingly inter-dependent global economy most countries can no longer guarantee their maintenance from within their own territory. This places an ever greater importance on the need to maintain the open, rules based, global trading system on which so much of the world's post-Second World War prosperity has depended.

THE PILLARS OF PROSPERITY

ENERGY SECURITY

CLIMATE SECURITY

FOOD SECURITY

WATER SECURITY

After ensuring territorial integrity and internal stability preserving energy, food, water and climate security are the next most important imperatives facing governments. Any significant failure to maintain the pillars will quickly result in regime change whatever the nature of the regime in question. Governments everywhere are now finding this an increasingly demanding task.

FOOD SECURITY

- Cereal consumption has doubled since 1970 but over 1 billion still undernourished;
- Demand will double by 2050;
- 30% of the world's major fisheries now have yields that are at less than 10% of their original level;
- Second food price spike now occurring again leading to export controls.

The sudden and sharp spike in global food prices in 2008 was a timely reminder of the political importance of food security. It led to food riots in over 60 countries and, indirectly, to regime change in one. More alarmingly, the immediate reaction of several food exporting countries – as it was again this summer – was to ban exports of food. The UN is now forecasting a 20% increase in global food prices in 2011.

Over a billion people remain undernourished despite a doubling of cereal consumption since 1970. As incomes rise, diets change to include more meat and dairy products whose production is itself increasingly grain intensive. The FAO expects the combined effect of population and income growth to lead to a doubling of world food demand by 2050. Expanding food production to meeting this demand growth will place considerable additional stress on the other three pillars of prosperity.

WATER SECURITY

- 2.8 billion people currently experience high water stress. Two thirds of China's cities, that is 400, already suffer water shortages;
- 70 rivers at maximum extraction;
- More than 250 rivers worldwide are depleted. In many years the Nile, Yellow, Indus, Rio Grande, Colorado, Oxus and Murray rivers do not reach the sea.

This will be most acutely true with water. In the past fifty years population growth and increased demand have combined to cut the freshwater per person available globally in half. Historically, water use has increased almost twice as fast as population. Already some 2.8 billion people live in areas of high water stress. On current trends that is expected to increase to 3.9 billion by 2030. Since the nineties, water prices globally have risen at a marginally faster rate than oil prices.

Agriculture is by far the largest consumer of water at 70%, industry, including energy, uses 23% and households about 8%. If the water environment becomes too severely compromised it will not be possible to sustain food production. 70 major rivers around the world are near maximum extraction levels to supply water for irrigation systems and several, including the Yangtze, Colorado and Murray, struggle, and sometimes fail, to reach the sea.

Across much of Central Asia, Latin America and South Asia rural livelihoods depend on glaciers. The glaciers of the Himalayas and Tibet alone feed seven of the world's greatest rivers – the Brahmaputra, Ganges, Indus, Irrawaddy, Mekong, Salween and Yangtze. They provide water to more than 2 billion people. These glacial water banks are already melting at an accelerating rate. In the 1990s, glacial mass fell at more than twice the rate of the previous decade

ENERGY SECURITY

- 2030
- 50%
- 83%
- 50%
- 116mb/d
- \$26 trillion

The World Energy Outlook projects global primary energy demand to grow by 1.6% a year to 2030. By then fossil fuels will account for 83% of the world's primary energy mix with demand for coal rising faster than any other fuel. This will drive energy related carbon dioxide emissions up by nearly 50% at a time when they need to be reducing by that amount. There is no immediate shortage of either coal or gas and both are more widely distributed geographically than oil thus lowering the political risks to energy security.

Oil is a different matter. The International Energy Agency (IEA) projections show oil demand rising to 116 million barrels a day by 2030. Debate rages over when we will experience peak oil – the moment when the amount of oil remaining to be found is less than that which has been used – but few oil analysts believe that production will rise much above 90 million barrels a day.

This is because it is proving ever more difficult to match the rate of investment in new resources to the combination of the rate of decline in existing resources and that of the increase in demand. This recently produced the unusual sight of the head of the IEA imploring government to do more on climate change in order to reduce the pressure on oil reserves.

The International Energy Agency (IEA) estimates that to meet the world's growing demand for energy will require an investment of some \$26 trillion between now and 2030. Doing so in a low carbon way would add about \$10 trillion to that cost but would also avoid the need to pay for over \$8 trillion worth of oil.

CLIMATE SECURITY

- 2⁰C
- 0.8⁰C
- 0.7⁰C
- 425 ppm
- 2/3 ppm
- 450 – 550ppm
- 2070

There is now a high degree of confidence in the basic science of climate change. We know from observation that global average temperatures have risen by about 0.8⁰c in the last century. We also know from observation that the concentration of greenhouse gases in the atmosphere is now some 425 parts per million (ppm) carbon dioxide equivalent. Because of the lags in the response of the earth system, even if we stopped any additional carbon entering the atmosphere today, we would still experience another 0.7⁰c rise in global average temperature.

Whatever we do, or do not do, we are now committed to a rise in temperature of 1.5⁰C. This is very close to the 2.0⁰C threshold that political leaders have said marks the boundary of dangerous climate change. Beyond this point climate change will become progressively more unmanageable. Greenhouse gas concentrations are currently rising at about 3ppm per year. To have any chance of keeping within the 2⁰C threshold we need to

keep the concentration within the range of 450-550ppm. A recent analysis by the Hadley Centre suggests that at current emissions levels the global average temperature could have risen by 4°C by as early as 2070. That is well within the lifetime of major mining projects being planned today.



SHARED DILEMMAS

Each of these pressures would be significant in its own right, but it is the interactions between them that poses the more serious problem. These are poorly understood, pay no respect to geographical or bureaucratic boundaries and will be very difficult for governments and businesses to manage.

These two data sets above define a shared dilemma for the governments of the world. Without an increase in energy services on the scale projected by the IEA sustaining the economic growth necessary to maintain social and political stability will be impossible. But if that

energy growth is delivered primarily by current fossil fuel intensive technologies then avoiding the dangerous climate change which will also undermine social and political stability becomes impossible.

This is a true dilemma. Choosing one of the horns means being driven to the same unacceptable outcome by the other. Nor is searching for an illusory trade-off between the horns a solution. This simply increases the risk of achieving neither a sufficient increase in energy services nor avoiding dangerous climate change. True dilemmas must be resolved by meeting both goals simultaneously – in effect, by using imagination, innovation and investment to step out from between the horns.

Our food security is hugely dependent on cheap energy to make the chemicals and pump the water necessary to maintain agricultural productivity, the transport to get the food to ever more urbanised consumers and to run the machinery to produce and process food. Without water for irrigation, far less land would be useful for food production, especially in the drylands where a great many of the world's poorest people live.

These stresses on the pillars of prosperity are not unmanageable. There is no doubt that humanity possesses the technical competence to do so effectively. There is a deep and growing understanding of the stresses. Essential technologies and appropriate engineering skills are already in existence. Furthermore, it is also clear that there is no fundamental economic barrier to their management, although there are large barriers to the equitable allocation of the necessary capital.

The complexity and dynamic nature of the relationship between these pillars does, however, present difficulties to public policy and to politics which of a wholly new and

difficult kind. Managing these interactions effectively will require the achievement of a step change in the level of policy coherence by governments at all levels from the local to the global. But even the achievement of more coherent policy designs will do little to change outcomes if those better designed policies are not vigorously implemented.

The institutional structures governments currently have in place to tackle these issues treat each one separately. Typically, energy, water, food and climate are each dealt with by different government departments and agencies. Each has a separate constellation of supporting professionals and cluster of related businesses. This significantly increases the risk of policy cannibalism as the solutions to one problem add to the difficulties of another.

Threatened water security can be addressed by energy intensive desalinisation and water transfer projects but at the risk of undermining energy security by increasing dependence on expensive imports. If the extra energy is provided by the combustion of fossil fuels that will undermine climate security and thus the water security being sought.

If lower water security threatens food security by climate altered precipitation this can be compensated by the use of energy intensive agro-chemicals and water transfer projects. But, if the additional energy is provided from fossil fuels this increases the risk of further altering precipitation patterns and raising temperatures, thus undermining both water and food security.

Little is gained if the policy effort to strengthen one of the pillars of prosperity simply weakens another. In particular, poor policy coherence undermines the ability of the business world to make confident and timely investment

decisions. It also complicates the task of aligning collaborative efforts along the business supply chain to manage this nexus of risks efficiently.

RISKS

• Major environmental events	• Abrupt policy shifts
• Indigenous peoples	• Failing states
• Secondary development	• Over-stressed communities
• Air /water pollution	• Emerging market miners
• Safety	• Sophisticated NGO actions
• Corruption	• Rise of greens
• Human rights	• Resource taxes
• Biodiversity	

The risks listed in the left hand column above are those with which the mining industry has become familiar over the last decade. These are endogenous risks. They result from the activities of mining companies themselves. Over the past decade the leading companies in the industry have greatly improved their capacity to manage them in response to society's demand that they do so. The result has been a cleaner, cleverer and more careful industry that is delivering more value, more reliably to shareholders.

The risks listed in the right hand column are only some of the exogenous risks. These are growing in importance as the pillars of prosperity come under greater stress. The distinctive feature of these risks is that they cannot be effectively managed simply by a company changing its own behaviour. In order to reduce its exposure to these

risks mining companies increasingly need to ask more of others in society.

Thus far the mining industry has been slow to build the necessary competence and capacity to do so. Traditionally, miners have been able to rely on governments to take responsibility for limiting the industry's exposures to these risks. This is no longer the case. Increasingly mining companies, as they make long-life, high capital investments, must be able to make good judgements about more than simply the legal, financial and operational risks of their investment. They must then be able to persuasively articulate the part others must play in making those risks manageable.

RESPONSES

- Promises
- Performance
- Intelligence
- Skill sets
- Resources
- Methodologies
- Organisational structures
- Connections
- Assets
- Narratives
- Collaborations

This prompts a set of critical questions for the industry to answer, for example:

Is the industry keeping its promises to society?

Can continuous improvement in social and environmental performance be credibly demonstrated?

Is there enough intelligence within the industry on the nature, scope and urgency of its exogenous risks?

Does the industry have the necessary skill sets to interpret this intelligence and manage the risks?

Is the industry's capacity to understand and manage these risks adequately resourced?

Are appropriate methodologies in place for properly valuing the exposures of mining projects?

Are the right organisational structures in place in companies so that management of exogenous risks is fully aligned with the management of other business risks?

Does the industry have the right set and intensity of connections to other social actors?

Are trust and reputation fully valued and as well managed like any other corporate asset?

Are there compelling narratives in use both internally and externally that fully communicate the industry's value to society and what its needs back from society to continue to deliver that value?

Is there a long and strong inventory of effective collaborations with other social actors embedding the industry more deeply in society?

The landscape of risk and opportunity for the mining industry in the 21st Century will be more complex and more volatile than it was in the last century. But now, as

then, the rewards will go to those company's that read that landscape best and navigate their passage through it more effectively.

There is no prospect of the aspirations of the planet's soon to be nine billion people being met without a mining industry that is both profitable and responsible. But there is no prospect of the mining industry being able to play its part in meeting those aspirations if it does not get much better at understanding and communicating what it needs from society if it is to do so.