



# Australia Report 2011

RISKS & OPPORTUNITIES



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# Foreword

The *Australia Report 2011: Risks & Opportunities* is our second annual publication designed to assist leaders across business, government and the wider community with a clear insight into the threats and opportunities that await us.

Our report addresses the risks and opportunities facing the nation over the next decade and explicitly acknowledges their interconnectedness with each other and the global forces at play.

Our paper provides a forward-looking capture of risks and opportunities across economic, political, environmental, societal and technological boundaries. It is a qualitative and quantitative report built on surveys and discussions with key leaders in each of these respective fields.

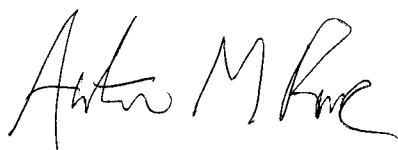
The aim is to provoke a public debate on key risks and opportunities, and inspire action to address them. It is intended that this research will help shape policy, inform business decisions, and bring risk management nearer to the top of the national agenda.

The issues captured here are a reflection of the issues top of mind of many Australians such as the environment and carbon pricing debate, concerns about global imbalances and

divisions within the Australian economy, and the opportunity for Australia to play a part in shaping regional and global thinking. Our discussion forums highlighted the need for Australian policymakers and business leaders to be proactive in planning for risks and to anticipate longer-term, cumulative risks. In doing so, we hope this will assist Australia to build on existing strengths and seize new opportunities.

We would like to thank those who gave up their time to complete the survey and to those who attended the discussion forums. A special word of thanks to Andries Terblanché for his assistance and contribution to the preparation of this report.

We are delighted to commend this paper to the national discussion in preparing for the challenges ahead.



**Anton Roux**  
Director of Programs  
ADC Forum

# Executive Summary

## INTRODUCTION

The Australian risk landscape lies within the global risk context. Historically buffered by geographical distance, we have become more connected and exposed to events elsewhere in the world than ever before.

This increasing interconnection comes at a time when Australia's physical distance from centres of economic power is also narrowing, with China forecast to overtake the United States as the world's largest economy within 5 years.

The World Economic Forum Global Risks report for 2011 identifies two pervasive global risks – economic disparity and global governance – and three major risk clusters: macroeconomic imbalances, an “illegal economy” nexus and a “water-food-energy” nexus. The business leaders, academics and policymakers consulted for this report are keenly aware of our global connections. The most severe and most likely risks they identify confronting Australia are part of an intricate web of risks that largely cannot be catalogued as strictly domestic or external: in most cases they are both.

This report is, necessarily, a snapshot in time: recency has an impact on perceptions of the likelihood and severity of risks to Australia over the coming 10 years. However, the study aims not only to track risk, but also the perception of risk. It is important to look not only at what has changed since the previous survey, but what hasn't: to examine chronic conditions as well as critical ones.

## OVERARCHING THEMES AND KEY MESSAGES

Risks emerging from the natural environment continue to dominate the Australian risk landscape (Figure 1). There is rising concern about potentially slower growth among our major trading partners, our ability to support our ageing population and about economic risks relating to our potential exposure to debt-burdened European nations.

The majority of these are risks without borders: global phenomena, with specific country risks. Australia is part of a world in which bad economic news travels faster than cyclones. A ratings agency's announcement of a negative outlook for a major trading partner has immediate impact on our equities and currency, while a sovereign debt default in Europe may stand to impede Australian access to capital.

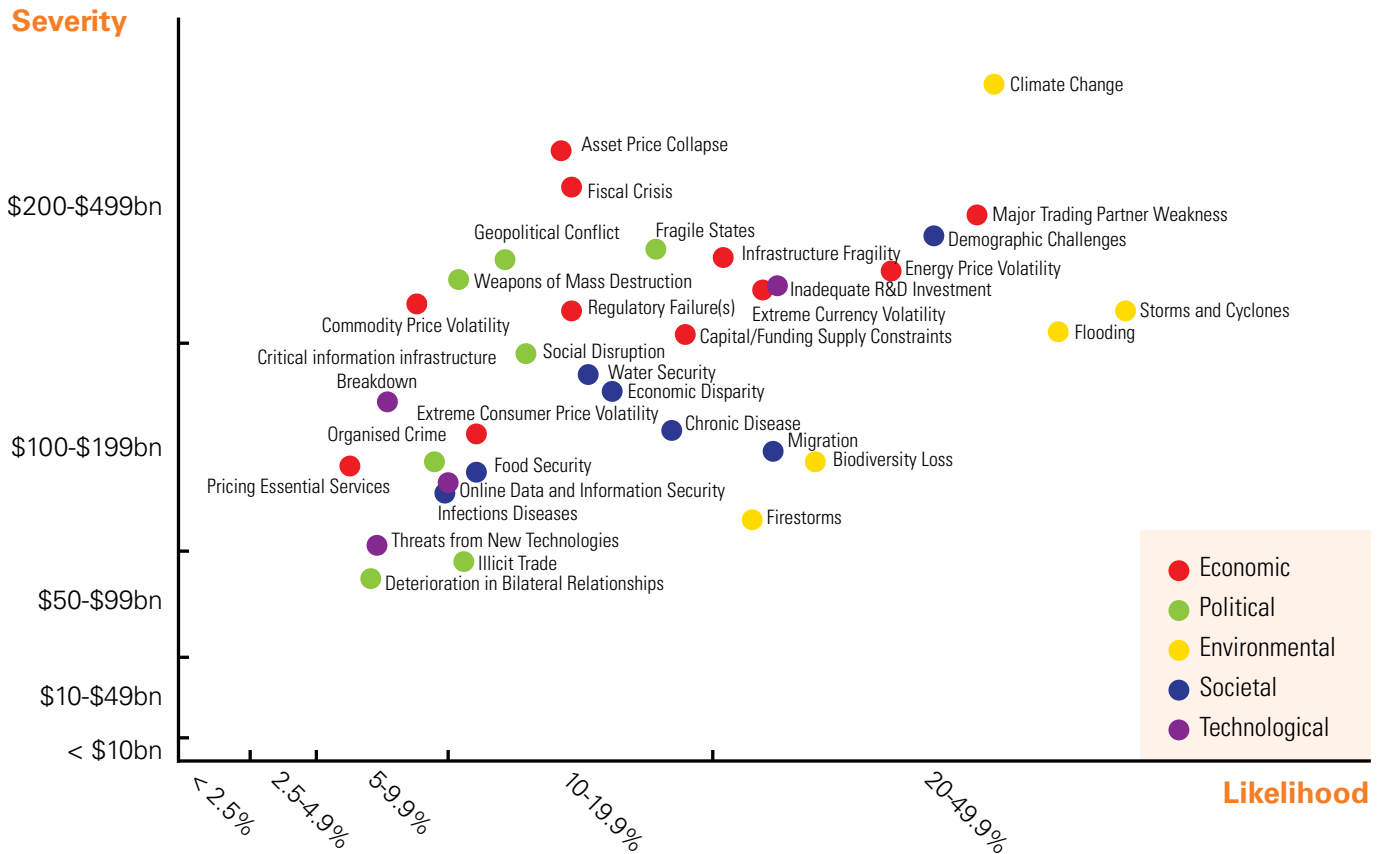
The speed with which a single event can affect an entire web of interconnected risks highlights the need for Australia to be proactive in planning for risks. Extreme events – outliers with extreme impacts – need to be included in scenario planning, not dismissed as too improbable to bother planning for. Hindsight often helps us see the patterns that lead to such events, making it even more important to identify and attempt to measure the likelihood and severity of longer-term, cumulative risks, and to be conscious of their consequences and cascade effects.

This highlights the overarching theme of this report: that of interconnectivity. No single risk exists in isolation, with almost every risk identified as having links to others, spreading from one category to another. The risk landscape shows which risks are regarded as standouts but it is significant that some risks closer to the centre of the picture – such as economic disparity – are more highly interconnected.

## CRITICAL RISK FACTORS FOR AUSTRALIA

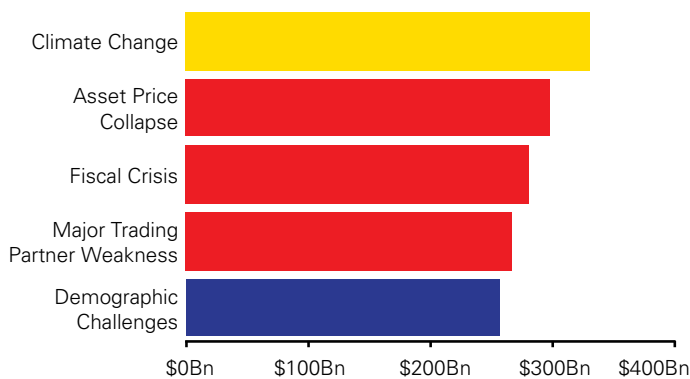
- For a second time, environmental issues dominate the risk landscape, with *climate change* the standout risk in terms of both likelihood and severity (Figures 2 and 3).
- *Major trading partner weakness* is perceived as the most likely economic risk to Australia as Japan grapples with the aftermath of its recent earthquake and tsunami, China anticipates slowing growth and the United States continues to struggle with an uncertain outlook.
- *Asset price collapse* is rated the most severe economic risk. Although most respondents saw this as relatively unlikely, it reflects concerns about overseas asset pricing and uncertainty about the outlook for Australian property, especially housing.
- *Fiscal crisis* is rated as one of the three most costly risks, albeit less likely. Our own risk of this is low but the fallout from a European sovereign debt default would make it more difficult and expensive for Australian banks to access wholesale funds.
- The risk associated with *demographic challenges* is rated in the top five for both likelihood and severity. At present Australia has about five people of working age to help support every retiree; in 30 years, the ratio will have fallen to less than 3:1. Australians' standard of living will suffer if we fail to find ways to enlarge our tax base and improve productivity.

# 1. RISK LANDSCAPE

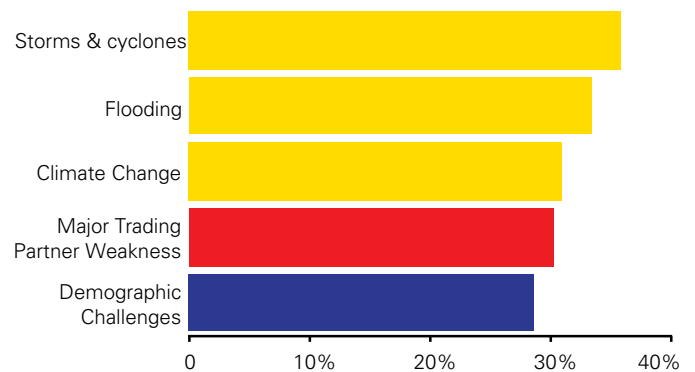


Refer to pages 30 and 31 for a complete list of risks and explanations.

## 2. TOP 5 RISKS - SEVERITY



## 3. TOP 5 RISKS - LIKELIHOOD



## RISK INTERCONNECTIVITY

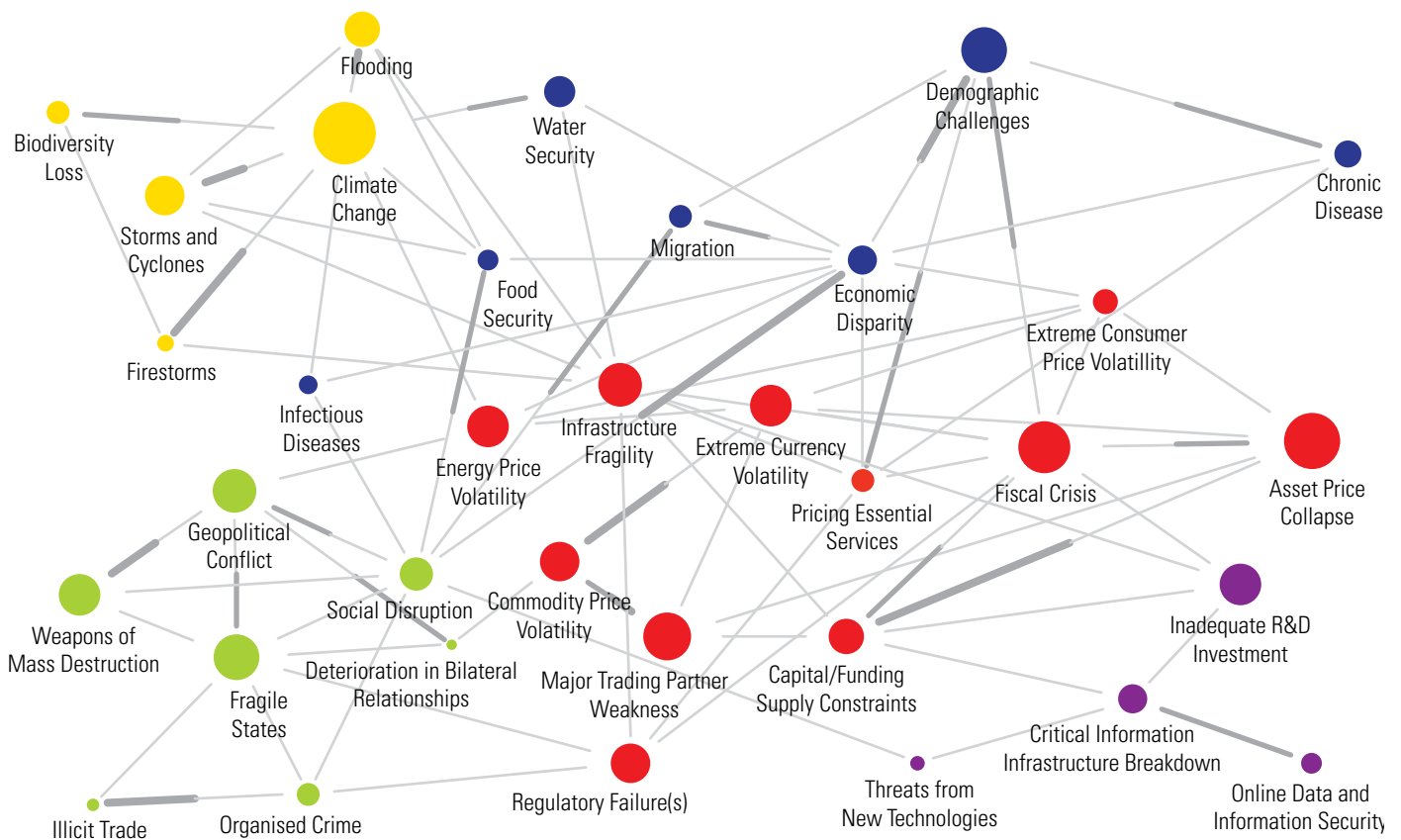
Identifying risk inter-relationships (Figure 4), and in particular which risks have common characteristics to a range of risks, is essential to understanding the forces behind these risks. This analysis shows that risks do not exist in isolation, and illustrates the paths via which the effects of a single event can compound and spread. But there is an upside: identifying these relationships helps us home in on points at which we can most effectively mitigate risk and seek opportunities.

- The single most interconnected risk is *economic disparity*. It is at the centre of a cluster of ten further risks across the societal, economic and political categories, suggesting that respondents are conscious of the way in which income disparities – which have widened in Australia over the past 3 decades – threaten stability and productivity.

- The second most interconnected risk is *infrastructure fragility*, at the centre of nine risks spread across the economic, environmental, societal and technological categories. Much of Australia's infrastructure is ageing and is under increasing stress. It is not being replaced or modernised fast enough. Many new projects are designed to meet only existing, not future demand, with worrying implications for our standard of living and ability to service and compete in the global economy.

- Other risk clusters centre on *social disruption*, *fiscal crisis* and *climate change*. Many of the risks surrounding these also appear around the risks named above: for example, *water security* appears in three out of five of these clusters, as does *pricing of essential services*.

## 4. RISK LINKAGE



### Key:

Larger circle = greater severity.

A thin line shows risks that are related. A thicker line indicates a risk that makes the originating risk worse. For example, survey respondents indicated that *climate change* is the most pertinent risk to make *firestorms* more likely or potentially worse.





# ECONOMIC *Risks & Opportunities*

## HIGHLIGHTS

Australia remains economically confident compared with much of the world. However, concerns about factors beyond our borders are reflected in the standout economic risk, *major trading partner weakness*, and concerns about *asset price collapse* and *fiscal crisis*.

*Fiscal crisis* (Figure 5) was among the most interconnected risks facing Australia, reflecting fears about the likely fallout from a major European collapse and consequent impact on Australian institutions' access to and cost of funds. This risk is strongly linked to *asset price collapse*. *Infrastructure fragility* (Figure 6) is the most widely interconnected of all economic risks surveyed, linking directly to risks in four categories.

A risk to watch that may assume greater significance is *capital/funding supply constraints*, itself directly linked to a range of economic and technological risks.

The resources boom presents Australia with a rich but finite opportunity to mitigate many of the risks identified, by establishing a fund to assist in financing long-term programs in the national interest. By doing so we can lay the foundations for a prosperous future and ensure that our present good fortune is shared with future generations of Australians.

Significant policy direction is required simply for Australia to maintain its position, let alone to prosper in the future. We need to diversify our systemic commodity exposure to Asia and boost education; review, modernise and co-ordinate ageing infrastructure nationally; and resolve the stalemate over carbon pricing to allow business to plan ahead, invest and capitalise on opportunities. Increasing productivity is critical.



## The resources boom presents Australia with a rich but finite opportunity to mitigate many of the risks identified...

*Major trading partner weakness* was the most likely economic risk for 2011 but *asset price collapse* and *fiscal crisis* were rated as most severe. Perceptions of risk in this category were dominated by shifting, increasingly negative economic forecasts for our biggest trading partners and the looming possibility of sovereign debt default in Europe.

*Major trading partner weakness* was seen as one of the five most likely risks to Australia, and one of the five most severe. This represents a shift from 2010, where the risk of subdued Asian economies was seen as severe in impact but very unlikely. China, Australia's single biggest two-way trading partner, is anticipating slowing growth. Even so, China will remain an enormously significant trading partner for Australia. The prominence of this risk in the 2011 landscape may reflect a level of unease about Australia's dependency on resource exports to China: they may become less profitable as China diversifies its supplier base for raw materials.

Japan is Australia's second-biggest trading partner: its share of Australian exports is about 15 percent. The effects of this year's earthquake and catastrophic tsunami are expected to keep Japan's economic prospects subdued: yet orders for commodities such as Australian coal and iron ore are expected to be interrupted only briefly. The rebuilding effort will add to demand for raw materials. Damage to agricultural land and concern about radioactive contamination of food production may add to demand for Australian agricultural exports.

Although the survey was taken before ratings agency Standard & Poor's cut its outlook for United States government debt from stable to negative, *fiscal crisis* was among the most highly rated and interconnected economic risks. Australia is in a strong fiscal position, with government net debt levels well below other G20 members. However, the possibility of sovereign default by at least one of Greece, Portugal, Ireland or Spain is considered increasingly likely. A new European Union stability mechanism is being negotiated and due to take effect by mid-2013 but its ability to contain the consequences remains uncertain.

Australia is far from unique in fearing the fallout from a major European collapse but we are particularly

vulnerable to such an event because of our banking system's reliance on global wholesale debt markets. Between 25 and 30 percent of funding comes from offshore: such a crisis is expected to make access to these funds more difficult and/or expensive. The coming three years may be especially challenging for our banks as international demand for refinancing is expected to be high during this period.

*Fiscal crisis* and *asset price collapse* are strongly inter-connected risks. *Asset price collapse* is seen as a far more likely and more severe risk than in 2010.

Although the outlook for Australian equities is broadly positive, our sharemarket moves in step with international markets and is exposed to the same shocks. Moreover Australia invests heavily in overseas markets through our substantial superannuation pool. In June 2010, Australian superannuation funds had slightly more than \$48 billion invested in international shares – 23 percent of total assets.<sup>1</sup>

The risk rating for *asset price collapse* may also reflect concern over Australian property prices. These are high in historical and global terms. From the post-war period until the 1980s, an average house in a capital city cost roughly 3 years of average earnings. By late 2010 this had doubled to six years of average household earnings, with Sydney, Melbourne, Perth and Adelaide identified in a global survey among the world's top 3 percent of least affordable cities; another international survey asserted that Australian houses were 56 percent overvalued.<sup>2,3</sup>

However, it is also argued that price-to-income ratios are lower than this Australia-wide and unexceptional by global standards; that high metropolitan prices are supported by limited supply; and that Australian default rates are low. More recent data shows prices softening, while housing construction figures are slowing and residential land sales on the fringes of major cities have fallen sharply.

Even so, affordability remains a live issue, with a looming likelihood that Australians are already being divided into those who own property and those who never will. Our entrenched culture of home ownership is about more than shelter and assets: for example,



residential properties secure SME loans, while ownership diminishes social security dependency among the elderly. A substantial long-term change to home ownership rates could affect societal risks such as *demographic challenges* and *economic disparity*.

*Capital/funding supply constraints* sits at the centre of the 2011 risk landscape. Australian banks appear well placed to meet the standards imposed by the Basel 3 rules to be phased in from 2013; however they will face increased pressure to continue to lift their deposit bases.

The availability – or scarcity – of capital has profound implications for the highly rated and interconnected risk of *infrastructure fragility*. This is the second year in which the survey has shown high levels of concern about underinvestment in infrastructure. The Federal Government’s recent announcement of tax concessions to attract more private-sector investment to infrastructure projects, and of increased funding and autonomy for Infrastructure Australia, are welcome. Yet these initiatives fall short of what is required to deliver appropriate infrastructure for the long term.

Australia’s infrastructure deficit is estimated to stand as high as \$700 billion. To address this deficit over the next decade would require a doubling of the \$60 billion currently spent each year on infrastructure.<sup>4</sup>

A high proportion of Australia’s infrastructure is approaching the end of its useful life, with replacement of ageing assets needed to meet the demands of a rising population (regardless of low – or high-growth assumptions), increasing natural resource exports and sustainability objectives. Not only is substantial capital investment required; whole-of-life operational performance and maintenance must be funded.

The latest Engineers Australia five-year report card (November 2010) found that while many sectors planned major capital works, this was mostly to meet existing rather than future demand and few projects were funded. In the 19<sup>th</sup> and 20<sup>th</sup> centuries the public sector

was the primary financier, owner and operator of infrastructure. In recent decades public-private partnerships have played a greater role but have become increasingly difficult to secure. Australia’s superannuation pool is seen as having potential to provide a greater proportion of infrastructure funding.

Continued underinvestment in infrastructure will not only compromise the standard of Australia’s transport, hospitals, water and energy supply: it will hamper our ability to compete with more modern, integrated, sustainable infrastructure in emerging economies, and to make the productivity gains that are critical to future growth.

Productivity growth cannot be achieved without addressing Australia’s skills shortage. Further funding of apprenticeships will help in the long term; in the meantime, Australia needs a well-targeted skilled migration program. *Inadequate research and development* is identified as one of the more likely and severe risks confronting Australia, yet better use of technology is critical to raising productivity.

Significant policy direction is required nationally simply for Australia to maintain its present position and to benefit from opportunities emerging from global economic shifts. While we must continue to regulate foreign investment, we cannot be complacent about Australia’s desirability as a destination for offshore capital.

We must also remain conscious that the resources boom will not last indefinitely. We need to diversify our systemic commodity exposure to Asia. Education has been one area in which we have built an important export market. While our high dollar is partly to blame for falling overseas demand, we must also be aware that Asian countries are increasingly offering high-quality alternatives with which we must compete.

Australia can expand our range of exports to cater to Asia’s increasingly consumer-based economy and growing middle class. China is forecast by the International Monetary Fund to overtake the United States as the world’s biggest economy

by 2016. Managing our relationships with this economic giant will require skilful diplomacy as well as initiative.

In the medium term, however, we can expect the continuing industrialisation and urbanisation of China – and to some extent, India – to continue to drive demand for Australian commodities over a decade or more. That growth will however eventually come to an end. In the meantime Australia has an opportunity to ensure that the prosperity we attribute to a booming Asia is distributed throughout the community and secured for future generations.

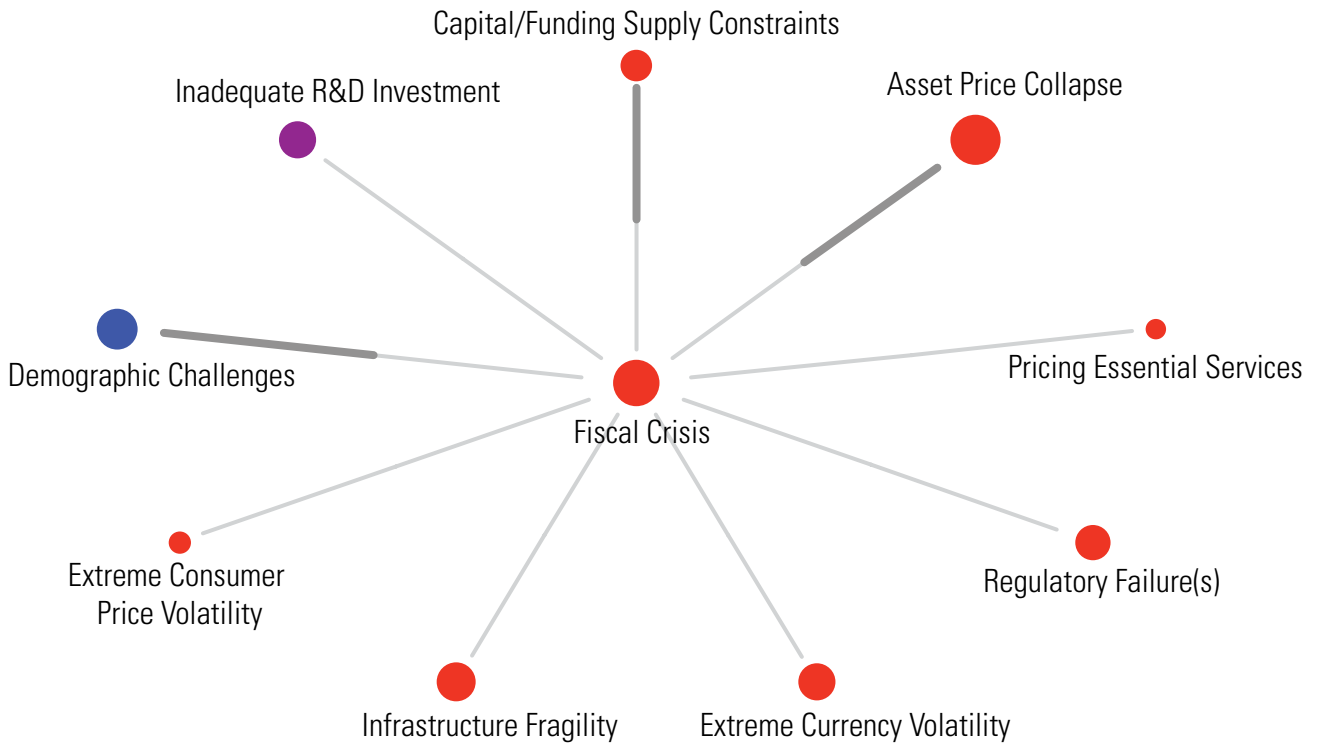
One vehicle for doing so might be a new sovereign wealth fund, potentially a powerful tool for risk mitigation. Such a fund, regardless of what we call it, need not follow the well-known Norwegian model; some commentators argue that Australia is better suited to the kind of fund established by Singapore. One option would be to finance it through budget surpluses.

Quarantined from the demands of the electoral cycle through tightly written governance rules, the fund could help mitigate imminent problems, such as the need to support and provide medical care for our ageing population. Its most important role would be the funding of national programs requiring long-term expenditure, such as education and infrastructure. It could also help fund low-carbon emission technologies.

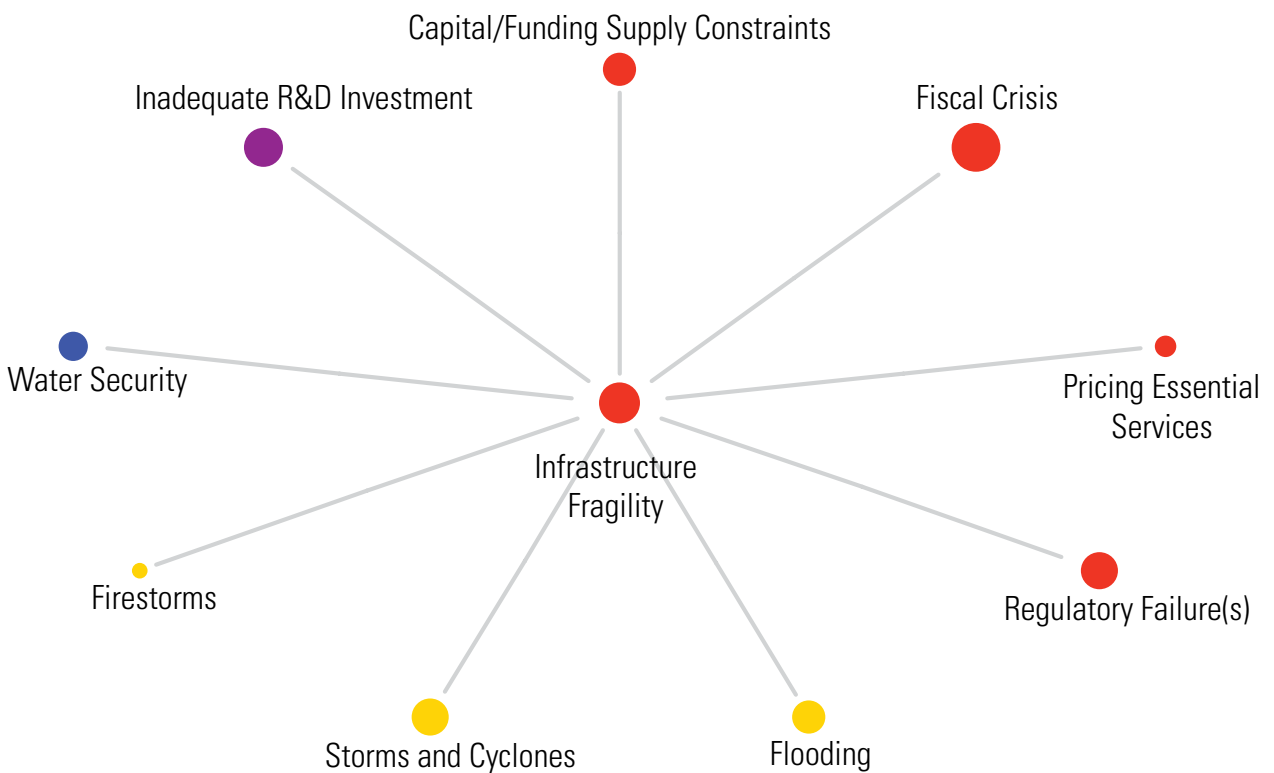
Resolving the stalemate over carbon pricing is critical. Without a transparent pricing regime, not only will Australia struggle to address our emissions challenge and improve energy efficiency – we risk being left behind in the global move to a low-carbon world.

Business needs a framework against which to make decisions about investing in low-emissions technologies and to capitalise on new opportunities in expanding renewable energy and cleantech industries. Australia needs policies and a regulatory regime that will allow us to compete with the low-carbon economies of the future.

## 5. FISCAL CRISIS



## 6. INFRASTRUCTURE FRAGILITY





# POLITICAL

## *Risks & Opportunities*

### HIGHLIGHTS

*Social disruption* (Figure 7) is the most interconnected political risk, at the centre of a web of political and societal risks. Among the most significant is growing *economic disparity* that weakens Australia's social fabric and prosperity.

Federal and state governments are increasingly prioritising politics over policy, leaving Australia ill-equipped to address chronic risks such as *demographic challenges*, *infrastructure fragility* and *inadequate R&D investment*.

Externally, *fragile states* are perceived as posing the most likely and costly political risk to Australia, with the survey being completed against a backdrop of unrest in North Africa and the Middle East and with some of our near neighbours continuing to suffer chronic social and economic problems.

Australia's democracy and institutions provide a stable environment for investment and innovation, a competitive advantage that is not being fully exploited.

Asia's growth and sourcing of Australian commodities and skills will inevitably end. While it lasts we have an opportunity to lay the groundwork for our nation's long-term stability and prosperity, by deploying the profits of the boom in ways that will benefit future Australians.



## Australia's democracy and institutions provide a stable environment for investment and innovation, a competitive advantage that is not being fully exploited.

Risks in the political category were broadly viewed as low in likelihood, with the highest severity ascribed to *fragile states*, *geopolitical conflict* and *weapons of mass destruction*. However, they were strongly connected to a range of societal risks. The most interconnected political risk was *social disruption*, in turn linked directly to the most interconnected of all risks: *economic disparity*.

Australia is one of many developed nations in which income inequality has widened over the past 30 years. The top 20 percent of Australian income earners are presently between seven and eight times richer than the bottom 20 percent.<sup>5</sup> The resulting disadvantage is not quarantined to low-income earners. Epidemiological researchers have found that violent crime, teenage births, infant mortality, poor literacy and numeracy, and mental illness, are all more common in more unequal societies. These affect people across all social strata. Although the poor benefit most when income gaps narrow, the majority also lead happier, safer lives with even the top strata of society experiencing better health and education outcomes. The stability afforded by narrow income and wealth gaps is a forgotten pillar of free markets. It is fundamental to a healthy economy: Australia stands to benefit if policymakers target "the gap".

However, federal and state governments increasingly prioritise day-to-day politics over long-term policy. Over the past 4 years, important reforms and infrastructure initiatives have been discussed and put forward, only to be diluted or abandoned by governments too fearful of electoral backlash to take decisive action.

Australia's present prosperity owes much to the redesign of the national economic structure of the 1980s and the productivity gains of the 1990s. Since the introduction of the GST in 2000, major, systemic policy initiatives have been notable mainly for their absence.

This political focus on the short-term – driven by the parties' own polling and focus groups, and by the demands of the media's news cycle – is arguably a risk in itself. It has already had an impact on the functioning of bureaucracy. Policy designers require clear briefs and adequate timelines: continually shifting

political parameters and pressure for fast turnarounds make it difficult to deliver effective programs.

This failure to formulate and implement bold policy initiatives for the long term leaves Australia exposed to several of the most highly rated and interconnected risks and unprepared to mitigate them. *Economic disparity* is only one – others include *demographic challenges*, *infrastructure fragility* and *inadequate R&D investment*. All are risks that undermine our ability to raise productivity, threatening Australia's long-term stability and prosperity.

That both major parties have said they are committed to returning the budget to surplus in 2012/13 – primarily on political rather than economic grounds – suggests that neither is likely to be willing to fund big investments in productive infrastructure, or in programs to upgrade education and skills.

This focus on the short-term comes at a time when Australia's key trading partners and traditional allies are looking well into the future. Even at a time of continuing economic uncertainty, the United States has undertaken to raise government spending on research and development to its highest level since the Kennedy administration.

Chinese infrastructure planning includes the extension and modernisation of its road network from the present 1.4 million kilometres to 4 million kilometres in 2050; and 150 separate major infrastructure projects to bring together nine cities in the Pearl River Delta as a future megacity serviced by coordinated transport, telecommunications and utilities.

In the United Kingdom, the policies of Prime Minister David Cameron are being drawn in part from a new Conservative philosophy that questions unfettered free markets.

This school of thought argues that the welfare state and the market state have each failed, with both having imposed barriers to social contribution and mobility, and having led to more unequal societies. A "civic state" is proposed, one in which individuals can flourish but the common good prevails. This "big society" model encourages decentralisation and the participation of smaller players in the delivery of public services.<sup>6</sup>



Of all political risks, *fragile states* are again perceived as posing the most likely and costly political risk to Australia, with this survey being completed against a backdrop of revolt and unrest in North Africa and the Middle East. Countries such as Pakistan, Afghanistan and North Korea pose ongoing threats. Closer to home, Papua New Guinea and the Solomon Islands face challenges including failing rule of law and internal conflicts. Our most populous neighbour, Indonesia, struggles with chronic poverty.

The World Bank estimates that more than 1.5 billion people live in fragile or conflict-affected states. Countries where rule of law is compromised are more likely to succumb to civil war and criminal violence. In an interconnected world, the effects of violence in such states quickly spread beyond national borders via refugees, epidemics and criminal networks.

Perceptions of the likelihood and costs of *organised crime* and *illicit trade* were relatively low but were seen as more likely than in 2010. Organised crime networks flourish in fragile states. They traffic people, arms, laundered money and illicit drugs. Prostitution has become a globalised industry. Drugs are a bridge between the world's wealthiest and poorest countries, with the annual value of global trade in heroin and cocaine estimated at more than \$US150 billion and illicit trade in genuine and false pharmaceuticals adding much more.<sup>7</sup>

It is in Australia's interest to maintain and strengthen ties in Asia and the Pacific, and not for solely economic reasons. Australia's aid program is expected to double to \$8 billion by 2015: this will give Australia further profile and influence in the region. By fostering relationships that allow Australia to support good governance and effective law enforcement in neighbouring nations, we help maintain our own domestic stability.

The plight of fragile states underlines that Australia – with its stable democracy, respect for rule of law and (mostly) consistent regulatory regime – is an appealing destination for investors and innovators, offering a safe environment for investment in industrial and social infrastructure. It is a competitive advantage Australia has historically taken for granted.

As the recent, rapid fall in overseas tertiary student numbers has shown, that competitive advantage is fragile. The international education sector is particularly important to Australia's future, not just as a source of revenue – and of skilled migrants – but as a foundation for long-term, personal relationships with our neighbours. Today's Asian students become tomorrow's Australian ambassadors.

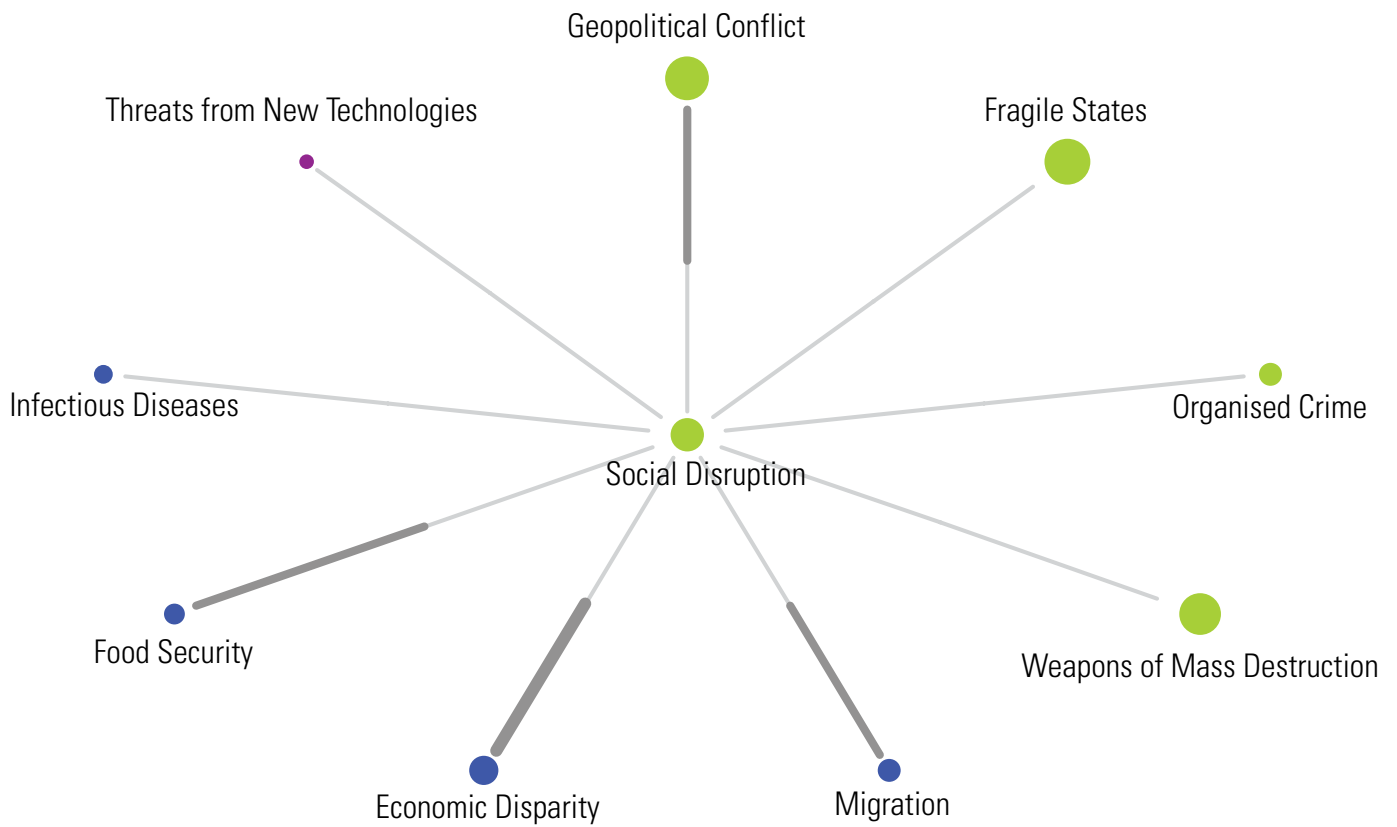
Asia's growth and sourcing of Australian commodities and skills is expected to underwrite our economic growth for the next decade and beyond. But we must remain conscious that it will end.

Australia has historically been regarded as a good manager of adversity and a poor manager of prosperity. To date, policy settings in response to the latest resources boom do not suggest otherwise. Our present good fortune presents an opportunity to change that.

Australia is lucky now but to prosper beyond the boom we need to be a clever country. We have known this for decades but the results have not matched the rhetoric. Changing mindsets may help: we can celebrate academic as well as sporting successes and improve Australians' political and economic literacy through schools and public education campaigns. But we need to spend money too, to ensure that all Australians – regardless of income or location – have access to the highest quality of education. Doing so will continue to be critical to Australia's engagement and success in an increasingly interconnected world. If we choose now to invest more of the profits of this boom in better education at every level, future Australians will benefit.

Australia's ability to address and mitigate many of the domestic and external risks that confront us now and in the future – and to seize opportunities – depends in large part on decisive leadership, with policy decisions predicated on merit, not popularity.

## 7. SOCIAL DISRUPTION





# ENVIRONMENTAL *Risks & Opportunities*

## HIGHLIGHTS

Risks emerging from our natural environment are among the most likely and costly confronting Australia, with *climate change* (Figure 8) regarded as the most severe of all risks.

*Storms and cyclones* and *flooding* were rated as the most likely of all risks, with biodiversity loss and firestorms also considered likely. These were strongly interconnected with societal risks such as *water security* and *food security*, and to economic risks such as *infrastructure fragility* and *energy price volatility*.

Climate science forecasts of increasing climatic volatility support these risk perceptions. Scenario planning must increasingly account for extreme events, even those considered least likely: we must find new ways to measure their likely incidence, severity and cost.

Australia's long-term experience of environmental extremes and climate-related natural disasters offers opportunities to develop new technologies, skills and industries for mitigating the effects of change.

Global markets for low-carbon technologies are forecast to grow rapidly, to at least \$500 billion annually by 2050. Australia has the capability to boost exports of clean technology, renewable energy and carbon capture, storage and market services.

Australia's inability to come to a conclusion on a long-term and sustainable approach to environmental management, for example a carbon price, exacerbates this risk.



**Australia's long-term experience of environmental extremes and climate-related natural disasters offers opportunities to develop new technologies, skills and industries for mitigating the effects of change.**

For a second time, respondents rated environmental risks – as a category – as the most likely and severe facing Australia.

*Climate change* – the human, economic and environmental consequences of climate shifts – is the survey's standout risk. It rates as having greater impact than any other risk, and expectation of likelihood is exceeded only by that of *storms and cyclones*, and *flooding*.

The 2010 survey was conducted a few months after catastrophic firestorms caused enormous loss of life and property damage in south-east Australia. This survey was taken in the aftermath of Australia's third-wettest calendar year on record. Storms and flooding in Australia's eastern states – especially Queensland – cost several lives. The Federal Treasury has estimated the economic cost at as much as \$9 billion.

Events of such magnitude inevitably affect risk perceptions. We should not lose sight of the fact that Australia has historically been a country of environmental extremes and faces ongoing challenges such as land degradation. However, climate science forecasts suggest that we should expect climate-driven catastrophes – from firestorms to floods – to become more frequent and extreme.

The floods of 2010-2011 illustrate many of the risk interconnections identified by respondents. *Climate change* was at the centre of a cluster of risks, with the strongest links to *flooding*, *storms and cyclones*, *firestorms*, and *biodiversity loss*. Despite the La Nina rains of recent months, respondents remained conscious of *water security* and identified *food security* as a further societal risk linked to *climate change*. The cost of flood-related agricultural losses in Queensland and Victoria is estimated at \$2 billion.

Footage of bulk carriers idling outside Queensland ports underlined the direct link respondents identified between *climate change* and *energy price volatility*, with the cost of lost coal production estimated at \$6 billion. The flooding of substantial tracts of Brisbane – many built long after the floods of 1974 – clearly showed how the effects of extreme climate events can be exacerbated by outdated or task-inappropriate infrastructure, and can

become disastrous when urban planners permit residential building in flood-prone areas without imposing appropriate design controls.

The survey makes those links – from storm and cyclones and flooding to the economic risk of *infrastructure fragility* – and then to *regulatory failure*. While the financial sector is paying individual and business claims above and beyond what is legally required, the floods have generated debate over the way in which different Australian states insure key assets against natural disasters.

Awareness of environmental risks was such that there were no apparent "sleeper" risks in this category. However, comparing this survey, and the previous year's – in which bushfires were regarded as the most likely environmental risk – does more than highlight the role recency plays in responses. It reminds us that it is possible, in a matter of months, to veer from one kind of environmental emergency to another.

With climate scientists forecasting increased climatic volatility and extremes, it can be argued that we have already arrived at a time at which we must regard "extreme" as normal. This means a new approach to scenario planning. In the past, planners may have chosen to overlook or plan minimally for scenarios with only 2-3 percent likelihood. From now, if those scenarios involve climate inputs – and the interconnections charts suggest that many do – they will need more detailed planning than in the past.

Global insurers and reinsurers have not reached consensus on what is causing extreme weather events, or whether human contribution is significant. However, they are profoundly aware that unexpected storms are occurring more frequently and causing more damage. Insurers have been on the front line of attempting to quantify the costs of these events. In Australia the Senate Economics References Committee is examining the insurance and reinsurance arrangements of the states and territories for assets and infrastructure – and whether fiscal arrangements for disaster reconstruction are appropriate.<sup>8</sup> This may come to affect the annual carve-up of Goods and Services tax revenue.



Insurers are also among those who observe that affluence, technology, rising consumer expectations and scaled-back planning regulation have made it easier for homeowners to build not for “where they live” but “how they want to live”. Older Australian houses have verandahs and eaves to help keep out heat: new ones depend on air conditioners. The traditional “Queenslander” house was built on stilts, not just to catch breezes and repel pests, but as a buffer from floods. Such buildings are reminders that to go forward – to mitigate and perhaps to profit from environmental risks – we may need to draw from the best of past design practices and adapt to environmental conditions instead of trying to overcome or ignore them.

Infrastructure and development planners must factor in not just the long-term, incremental effects of climate change, but the immediate possibility of more volatile weather events. Planning policy and codes should be reviewed and revised so that they do not assume a benign environment and exposure to economic cost shocks must be managed through risk assessments of potential damage.

While the impact of events such as *flooding* or *firestorms* is immediate and dramatic, many of the environmental challenges Australia faces are long-term and less visible but no less serious. Land degradation is a familiar Australian story: the continent’s soils are old and fragile with limited capacity to drain salt

and water. Arability – soil erosion and salinity, for example – can be addressed to varying degrees with reforestation and site-by-site management.

Australian agricultural science has considerable expertise in developing land use practices that are both productive and sustainable in an often hostile climate. Agricultural products are already a significant source of export income. We can do more to build on our exports of agricultural expertise as trading partners such as India seek to modernise and increase their agricultural production.

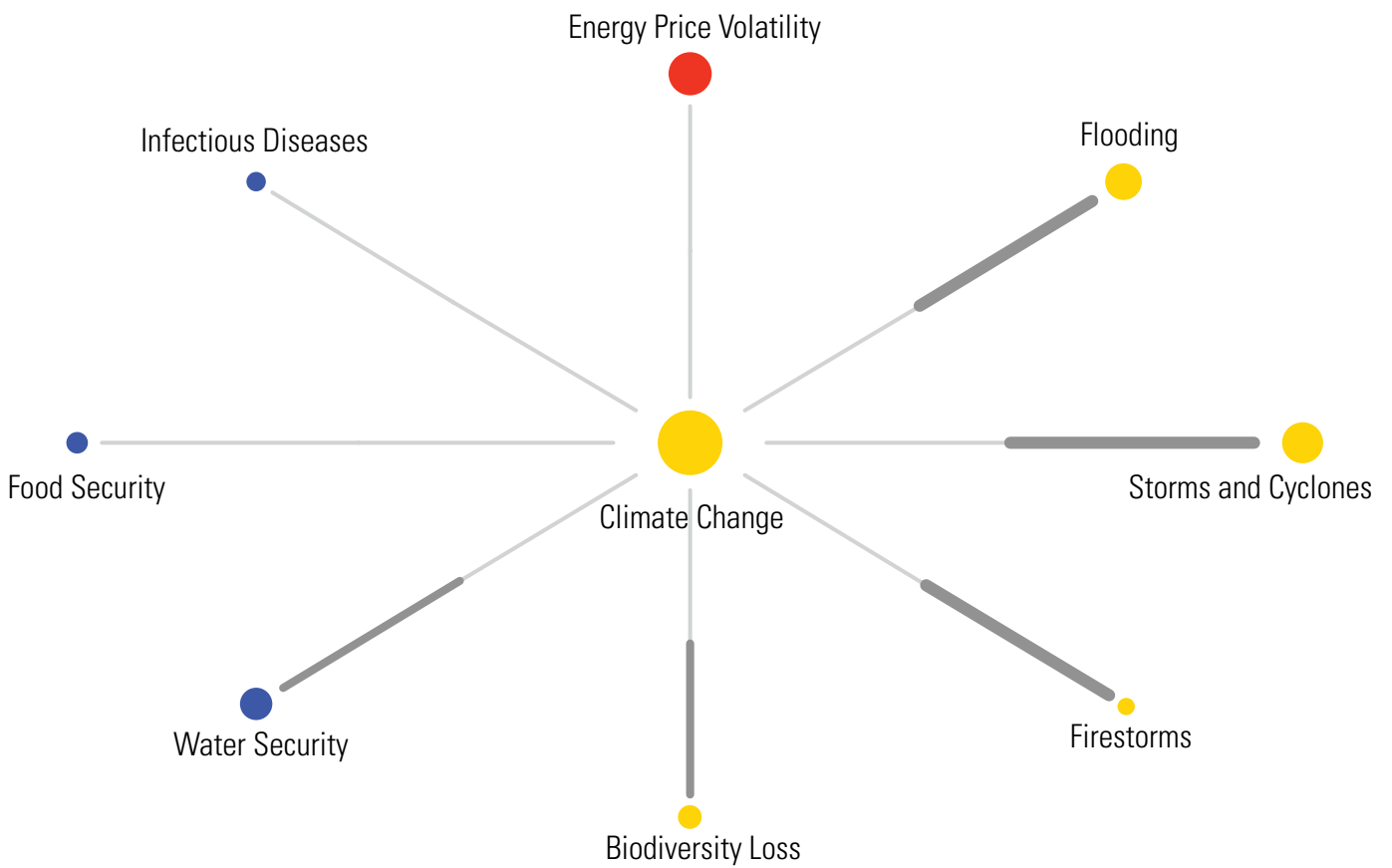
We need to reposition the narrative on sustainability. Too often it is framed solely in terms of risk mitigation when it is also a story of opportunity – including business opportunities. The Stern Review of 2006 forecast that by 2050, global markets for low-carbon energy products could be worth \$500 billion. Australia is well positioned to capitalise on this.

Although Australia’s extreme climate has often worked to our detriment, our experience aids us in identifying and developing new technologies, skills and industries for mitigating change. For example, water is the biggest sub-sector of the domestic cleantech industry, comprising 150 of Australia’s 750 cleantech companies. Solar is the third-biggest sub-sector with 91 companies: Australia has substantial export capabilities in areas ranging from renewable energy to carbon capture and storage.<sup>9</sup>

While political debate continues over the most appropriate national strategy for carbon pollution reduction, business is seeking certainty. Corporate Australia increasingly understands that sustainability is about more than corporate social responsibility, that business models need to change to reduce resource and energy costs, and that sustainability is potentially a source of growth.

Amid this uncertainty, companies must rely on scenario planning to identify and cost risks to their businesses – including those associated with complying with new climate-associated regulatory regimes. An absence of detail makes their task extremely difficult.

## 8. CLIMATE CHANGE





# SOCIETAL

## *Risks & Opportunities*

### HIGHLIGHTS

*Demographic challenges* are perceived as the most serious of societal risks facing Australia. They are among the five most likely and severe risks for the whole survey, highlighting concerns about the threat to Australia's economic growth and fiscal position posed by our ageing population.

*Economic disparity* (Figure 9) is the most interconnected of all risks, strongly linked to *demographic challenges* and *migration*. The latter link directly to each other, underlining the importance of a carefully managed migration program to help make up the skills and tax contribution Australia is losing as the baby boomers retire. Most migrants come from New Zealand, Britain, China and India – we need more.

*Water security* and *food security* also appear in this risk cluster. Water is central to the Australian risk landscape, while food is set to assume greater prominence as agriculture confronts a range of international and domestic challenges. A food strategy for 2050 will help Australia maintain domestic security and cater to export demand.

Integrated, far-reaching national plans are needed for urban and rural Australia, covering issues including managed migration to address demographic shifts and skills shortages; urban planning that enhances social cohesion; and regional planning that encourages more migrants to settle outside cities.

Raising workforce participation represents an opportunity for individuals, companies, and for Australia as a whole in mitigating *demographic challenges*. Innovative hiring and retention practices are already a source of competitive advantage for those businesses actively pursuing them.



**Integrated, far-reaching national plans are needed... covering issues including managed migration to address demographic shifts and skills shortages; urban planning that enhances social cohesion; and regional planning that encourages more migrants to settle outside cities.**

*Demographic challenges* rated as the fifth most likely and severe of all risks in the survey. Australia's baby boomers – the generation born between 1946 and 1961 are beginning to retire, taking with them their skills and their sizeable tax contribution.

These people began their working lives long before the introduction of compulsory superannuation, with the reasonable expectation of drawing a pension in return for their years of paying tax. They will – as a group – require unprecedented support in the form of social benefits. Only after 2020 will this group become largely self-funded. At the same time, they will live longer than previous generations, and require more health care.

We have been conscious of this unfunded social liability problem for decades. In the 2010 survey, risks associated with longevity were rated as among the most significant and likely facing Australia. The fact that *demographic challenges* appears at the far top right of the risk chart in this survey suggests that addressing this is seen as increasingly urgent.

More recent variables – Australia's two-speed economy, our increasing income inequality and the uncertainties associated with globalisation – have made the mix more challenging. *Climate change* – the survey's standout risk – is a further complication. While there is a strong case for increasing immigration to boost Australia's skills and tax base, it is also argued that our environment is already under strain and unable to support a substantially higher population. However, the relationship between population and environment is complex.

Of all the risks surveyed, demographic challenges loom large but another societal risk – *economic disparity* – is the most interconnected, indicating ongoing concern (also highlighted in 2010) about inequality.

*Economic disparity* is most strongly linked to the political risk of *social disruption* and to another societal risk, *migration*. Defined for this survey as having both economic and social benefits and costs for Australia, *migration* is essential for Australia's future prosperity and stability. Yet it is extraordinarily contentious, arguably because discussion of *migration* is often distorted by publicity surrounding a small

minority of would-be migrants – in 2010, 6,879 people arrived in Australia on 'unauthorised' boats.

Most of the people who settled in Australia in 2009-2010 came from New Zealand, China, India and the United Kingdom.<sup>10</sup> These patterns are expected to continue. Public discussion of Big Australia has receded over the past 12 months – political polling and focus group research has ensured this – but the social and economic benefits and costs of migration remain front-of-mind for many respondents. Without a bigger, more skilled population, Australia will be unable to adequately support increasing numbers of aged pensioners. Nor will it be able to develop the industries their grandchildren and great-grandchildren will rely on for future prosperity.

The birth rate is not expected to rise. However, Australia's population is forecast to rise from 22 million in 2010 to 25 million in 2020 regardless of whether we follow a 'big' or 'small' Australia trajectory. Sydney, Melbourne and south-east Queensland – Brisbane and the Gold Coast – will each add about half million residents over this time. The *demographic challenges* risk links closely to the risk of *fiscal crisis*, and to *infrastructure fragility*.

Well-managed population growth through the first half of this century will be crucial if Australia is to meet its economic, social, environmental and security goals. Sound planning, clearly articulated, will give the community and business confidence that it can be done well.

Treasury's Intergenerational Report of 2010 projects a population of 36 million in 2050 but public political talk of a 'big' Australia has been scarce over the past year. Boat-people politics again played a role in dousing the discussion. But private-sector research suggests that practical, day-to-day challenges play a part in many Australians' reservations about increased migration.<sup>11</sup> City-dwellers see that much of our urban infrastructure fails to meet the needs of our existing population. For that reason alone, some doubt that we can accommodate a big population increase.

It is, arguably, a 'chicken-and-egg' problem. Effective city planning, and the push to boost regional populations proposed in the population strategy, may



go a long way to addressing concerns. Better public and road transport can play a big role in mitigating frustration with city living, and in the long term better urban design can help bring jobs closer to where people live: the \$100 million of federal funding earmarked to help local and state governments boost employment on city fringes over the next 4 years is a start.

The emergence of *climate change* as a major risk has also weighed into perceptions of whether Australia can afford to support a bigger population in environmental terms. Many of Australia's environmental problems are not caused by the number of people living in Australia so much as by the volume of resources we consume and waste.

Australia is capable of supporting many more people, but if we are to do so successfully, a huge, long-term investment in infrastructure is essential, as well as changes to consumption patterns.

*Water security* is a societal risk directly linked to the survey's standout risk, *climate change*. Although not among the highest rated risks for likelihood or severity, it is embedded near the centre of the risk landscape. Even in wet years we remain conscious of water scarcity as a long-term problem: outside urban and regional centres, many Australian

households and businesses remain responsible for sourcing and storing all their water. Urban dwellers, for whom access to mains water is often limited by rationing, are increasingly collecting and storing at least some of their own water, an illustration of the role of changing social expectations in our response to risks.

While urban water supply is being secured through infrastructure such as desalination plants – already operational or under construction in each mainland state – much remains to be done to determine how much water can reliably be directed to agriculture. Ending the present impasse over the Murray-Darling basin will be crucial to formulating the future direction of agriculture in Australia's south-east.

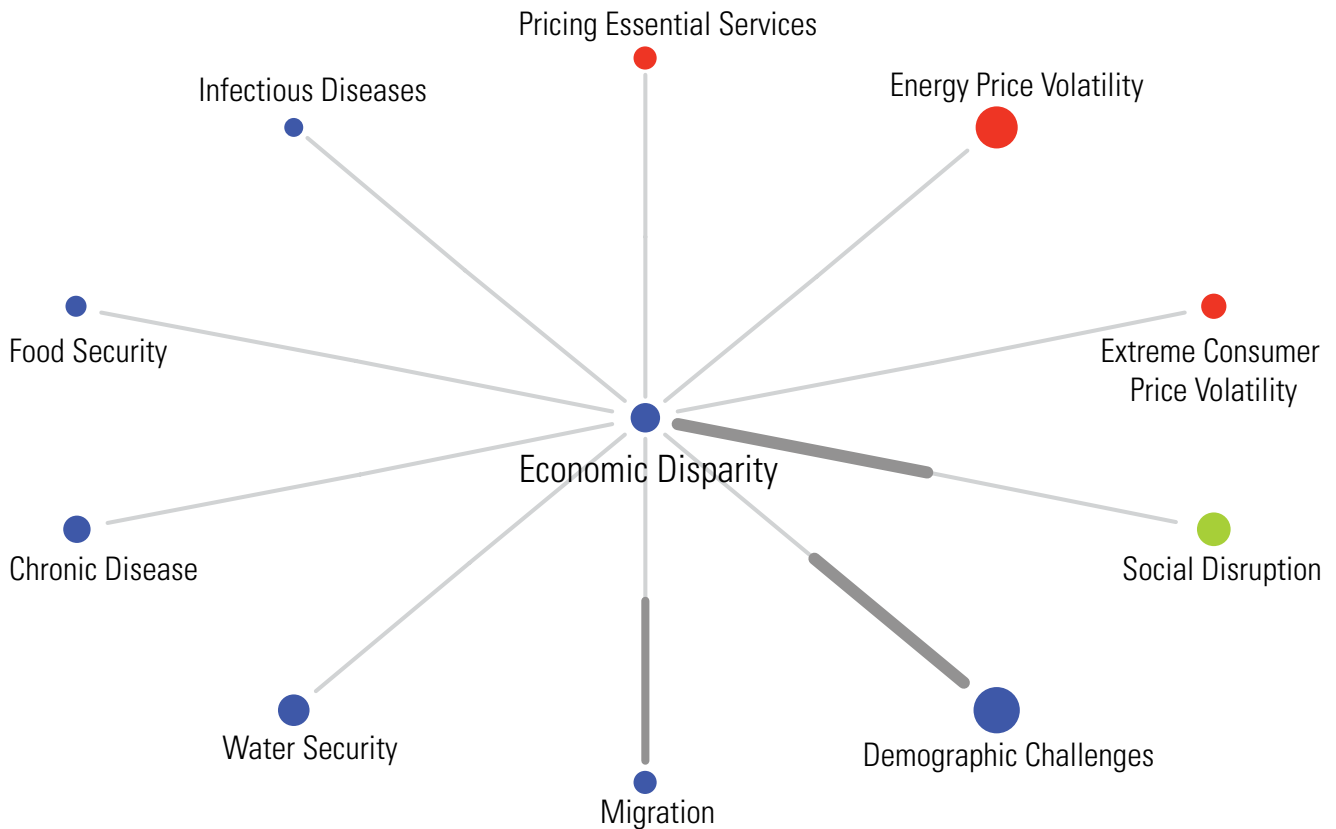
This comes at a time when Australia's farming population is ageing. Sixty percent of Australian farmers are expected to leave the land over the next 10 years, taking with them decades of accumulated, often multi-generational experience. Meanwhile, investment in agricultural research and development, a field in which Australia has historically been a leader, has declined as a proportion of gross agricultural production since peaking in the 1970s – and this drop has been linked to declines in productivity.

Access to food and the need to increase food production are two of the most pressing issues facing the world. Although Australia accounts for less than 3 percent of global food trade, we are a net food exporter. Developing workable responses to the global risk of *food security* represents a substantial opportunity for Australia.

A 2010 report for the Prime Minister's Science, Engineering and Innovation Council found that food supply was linked to the political stability of our region and had implications for national security. Although Australia is often spruiked as a food bowl for Asia, we can do more to make this a long-term reality.

Food has come to be regarded – not just in Australia but throughout the developed world – as a bulk commodity, to be produced and purchased as cheaply as possible. For primary producers this means low returns. There are implications for consumers too: in wealthy societies where hunger is no longer an issue, we see myriad health problems caused by poor nutrition. This in turn leads to higher health care and social security costs and lower productivity. As well as producing more food, we need to produce better food – and encourage Australian consumers to demand higher quality.

## 9. ECONOMIC DISPARITY



Australia is a relatively small player in world food markets, facing increasing competition from nations such as Brazil and South Africa, which have generally lower costs of production. However, focussing on quality and value-adding as well as quantity will enhance our presence in markets such as China, where middle-class, white-collar workers are showing increased interest in imported food and beverages.

For Australia to raise farm productivity efficiently while minimising agriculture's environmental footprint, we must invest further in research and development and remain vigilant about bio-security. Technological advances in food production, both at primary and manufacturing level, will require people to develop, deliver and apply them.

Too few graduates are opting for careers in agricultural science. With efficiencies often dependent on increased mechanisation, agriculture also suffers from the shortage of skilled tradespeople besetting other sectors. An increase to the Regional Sponsored Migration Scheme's quota for skilled workers was announced in the 2011 Federal Budget but even so, relatively unskilled labour remains a mainstay of many agricultural sectors and this is in short supply. Tasks such as fruit picking have become the province of itinerant

workers such as backpackers, who are willing to travel and who tolerate seasonality and low pay: there are calls for further changes to migration policy and resettlement support to help avert large-scale labour shortages.<sup>12</sup>

Australia's unemployed, and non-participants in the workforce represent an untapped resource. We have known for some time that increasing participation rates will play an important role in mitigating our *demographic challenges*, and a range of measures proposed in the latest federal Budget make a start on addressing this.

Two key cohorts in which Australian workforce participation rates lag those of some comparable OECD countries are women of child-bearing age (25-44 years) and people nearing retirement (55-64 years).<sup>13</sup> Policy settings have some capacity to reduce tax and social security disincentives. However, participation rates for these groups also reflect individual preferences. To encourage them to join, or rejoin the workforce, we need to change mindsets as well as policy. Innovative hiring and retention practices are already a source of competitive advantage for those businesses actively pursuing them. There is scope for further opportunity here, both for individuals and employers.

The societal risks confronting Australia are tightly interlinked with one another, as well as with risks in other categories. We cannot deal with them in isolation. Without a clear policy on population, it will be hard to make informed policy decisions on issues such as water and food security, the numbers and types of migrants we seek to attract and where and how we are to upgrade infrastructure. A lot is riding on our ability to successfully formulate a strategy for a sustainable population.



# TECHNOLOGICAL *Risks & Opportunities*

## HIGHLIGHTS

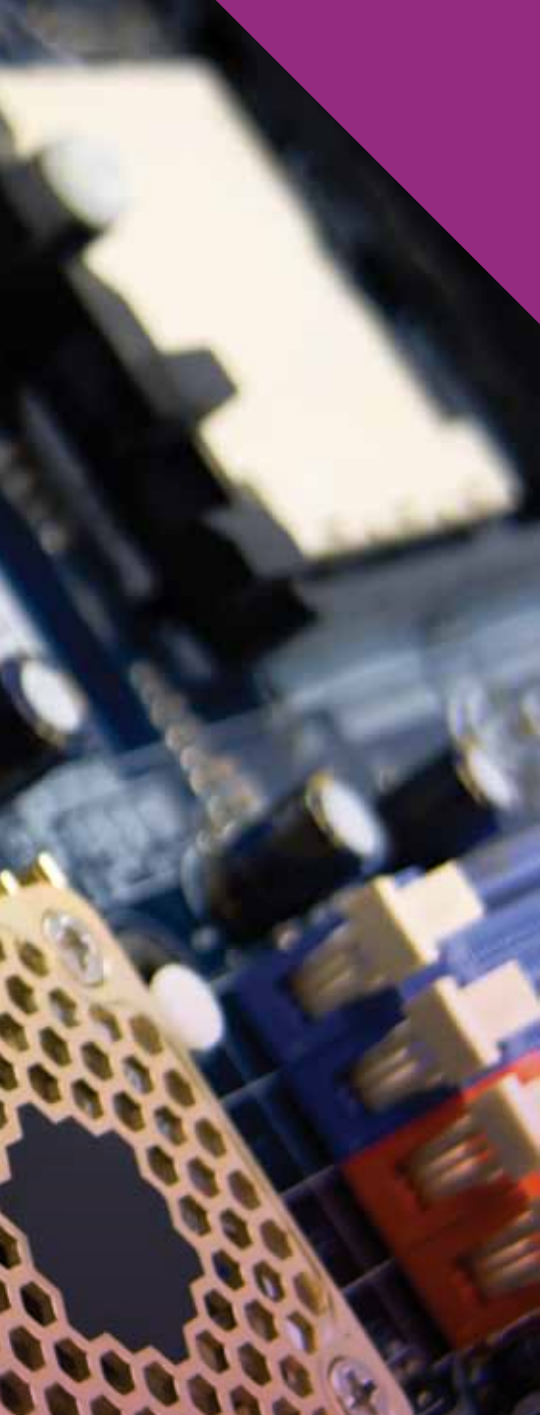
*Inadequate R&D investment* is the highest rated technological risk for both severity and likelihood, underlining continued concern about Australia's ability to position itself to mitigate risks and to recognise and exploit opportunities.

In terms of interconnectivity, *Critical Information Infrastructure Breakdown* (Figure 10) is at the centre of this risk category and likely to assume greater significance as organisations deal with the need to upgrade ageing systems.

*Online data & information security* is not seen as a likely or severe problem; yet Australia is not keeping pace with the nature and scale of growing online threats to individuals, governments and companies.

Innovation in technology offers significant opportunities to mitigate risks across a range of sectors, notably those associated with climate change. Leaders in business and government need to look beyond the short-term imperatives posed by profit and electoral cycles, and to initiate and support research and development at every level.

Improved education from early childhood onwards and retaining and attracting academic talent are critical. We should seek ways to lift Australia's technological profile globally: opportunities include establishing a Silicon Valley equivalent.



## Innovation in technology offers significant opportunities to mitigate risks across a range of sectors, notably those associated with climate change.

*Inadequate R&D investment* – for a second time – is perceived as the most likely and severe technological risk confronting Australia. It links directly to a range of economic risks and beyond these to risks in each of the remaining three categories.

Research and development has had an increasing presence on the world stage over the past 2 years. The United States has pledged to dedicate more than 3 percent of GDP to research and development and pointed to innovation as a historic and future driver of economic growth. China, meanwhile, has announced plans to ease its economy through slowing growth by diversifying beyond resource-dependent manufacturing to step up scientific development.

The Australian government says it recognises that we need skills for an innovative economy if Australia is to continue to aspire to high wages and living standards despite its relatively low population. The recent Federal Budget maintained most scientific research funding and a much-anticipated cut to medical research funding did not materialise, although some key agencies lost ground, including the Collaborative Research Networks program and the Co-Operative Research Centres program.

The record shows that Australian research and development spending as a proportion of gross domestic product has risen in recent years – but has continued to lag the OECD average.

This is despite a range of government subsidies for private sector research and development, suggesting new strategies may be needed to encourage business innovation. These strategies will need to overcome a mainstream corporate and investor culture that measures success largely in terms of short-term profit performance, with limited tolerance – let alone enthusiasm – for spending on initiatives that may take many reporting cycles to pay their way and ultimately record profit.

Corporate support for innovation has also been eroded by the rise of business theory that focuses on individual profit centres and frowns on cross-subsidies: research and development silos can make soft targets for those charged with cutting costs. Companies in which

R&D is embedded in every division of the business and communications lines are open are often better positioned to boost productivity.

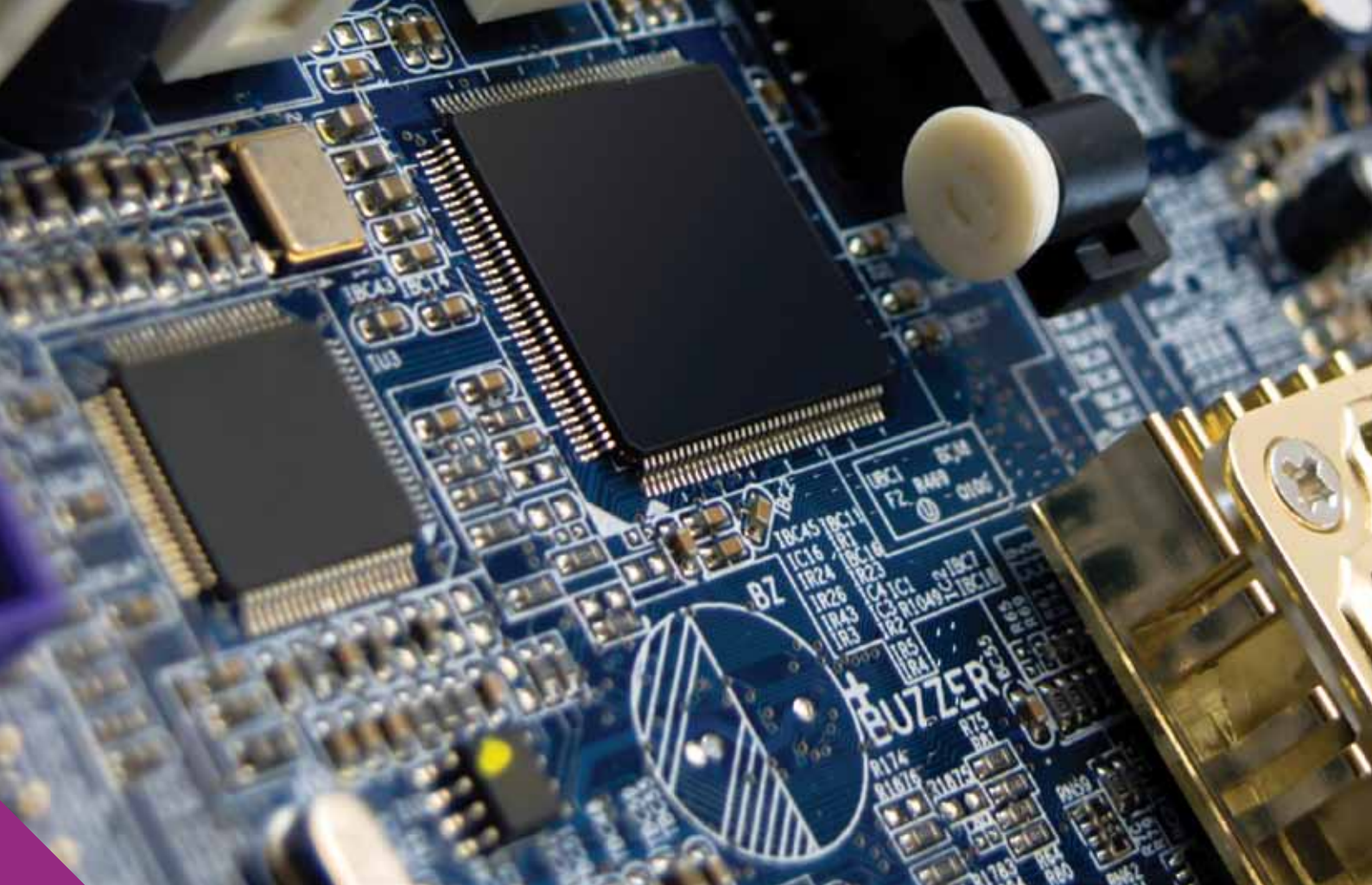
Money spent on R&D does not necessarily buy results, and spending more than competitors does not guarantee growth, profitability or returns but underspending limits these positive outcomes.

Mining companies are among those that have continued to increase R&D investment in recent years. It could be argued that this is because mining is booming, with plenty of capacity for spending on innovation; it can also be argued that the nature of mining makes it an industry in which taking a long-term view continues to be regarded by all stakeholders as a necessity, not an indulgence. Miners acknowledge that innovation has been critical to accommodating the past decade's explosion in export demand.

One of the risks most closely related to inadequate research and development investment is *Critical Information Infrastructure Breakdown*. This risk is at centre of the four technological risks. In the 2010 survey it rated as unlikely but severe in impact. In 2011 it is seen as more likely but the estimate of likely costs fell. *Critical Information Infrastructure Breakdown* is likely to assume greater significance in future as organisations deal with the need to upgrade ageing systems and defend against increasing threat of cyber crime.

The pace of technological change has often been an excuse for limiting expenditure on upgrades. Cost constraints are limiting longevity and security of technological infrastructure over time, with cheaper and less stable options pursued for short-term benefit. Some of Australia's biggest companies are already in an ongoing state of technological crisis management, with predictable fallout for stakeholder relations.

The technological risk cluster also connects to a range of economic risks with *fiscal crisis* and *capital funding/supply constraints* seen as threats to adequate research and development investment. One risk that is highly interconnected with *inadequate research and development investment* is *infrastructure fragility*, which links directly



to societal and environmental risks: inability to provide *water security*; and to plan for and respond to *flooding, storms and cyclones* and *firestorms*.

Technology offers a wide array of opportunities in risk mitigation. Australia has a long history of innovating to address risks such as *chronic disease* and *infectious diseases*. Changes to our climate present researchers and their backers with an array of possibilities.

The cost of effective global and Australian mitigation can be made materially lower if opportunities for innovation in low-emissions technologies are fully utilised. Global public expenditure on research, development and commercialisation of such technologies has increased since late 2008 and Australia should play its part in this. Recommendations for supporting commercial research and development include removing regulatory and legal barriers to new activities.<sup>14</sup>

*Critical Information Infrastructure Breakdown* links directly to what is arguably one of the most underrated risks: that posed by threats to *Online Data and Information Security*. Data fraud and loss was perceived as a relatively low risk in 2010. In 2011, risks associated with *Online Data and Information Security* were rated as somewhat more likely than in the previous year. Even as Australians

continue to embrace the cyber world, with internet shopping reshaping our retail landscape, it appears that Australia is not keeping pace with the nature and scale of online threats to individuals, governments and companies.

Cyber security is identified by the World Economic Forum 2011 Global Risks report as one of five key global risks to watch. Critical systems are under attack from cyber criminals and state-sponsored hackers. The US Centre for Strategic and International Studies has estimated the cost of such attacks at the equivalent of \$A2.3 billion annually. Targets have included a range of Western companies in the financial and industrial sector, as well as governments. Substantially more resilient information and physical infrastructure is needed for Australia to withstand such attacks.

Tackling issues such as this requires government to look beyond its electoral cycle focus, which is as short-sighted and arguably more negligent than the corporate culture that shackles many Australian companies to biannual profit reporting imperatives.

Australia has a productive history of commercial and academic research and development. Both owe much to state and federal education policy in the aftermath of the Great Depression and World War II. It is hard to underestimate

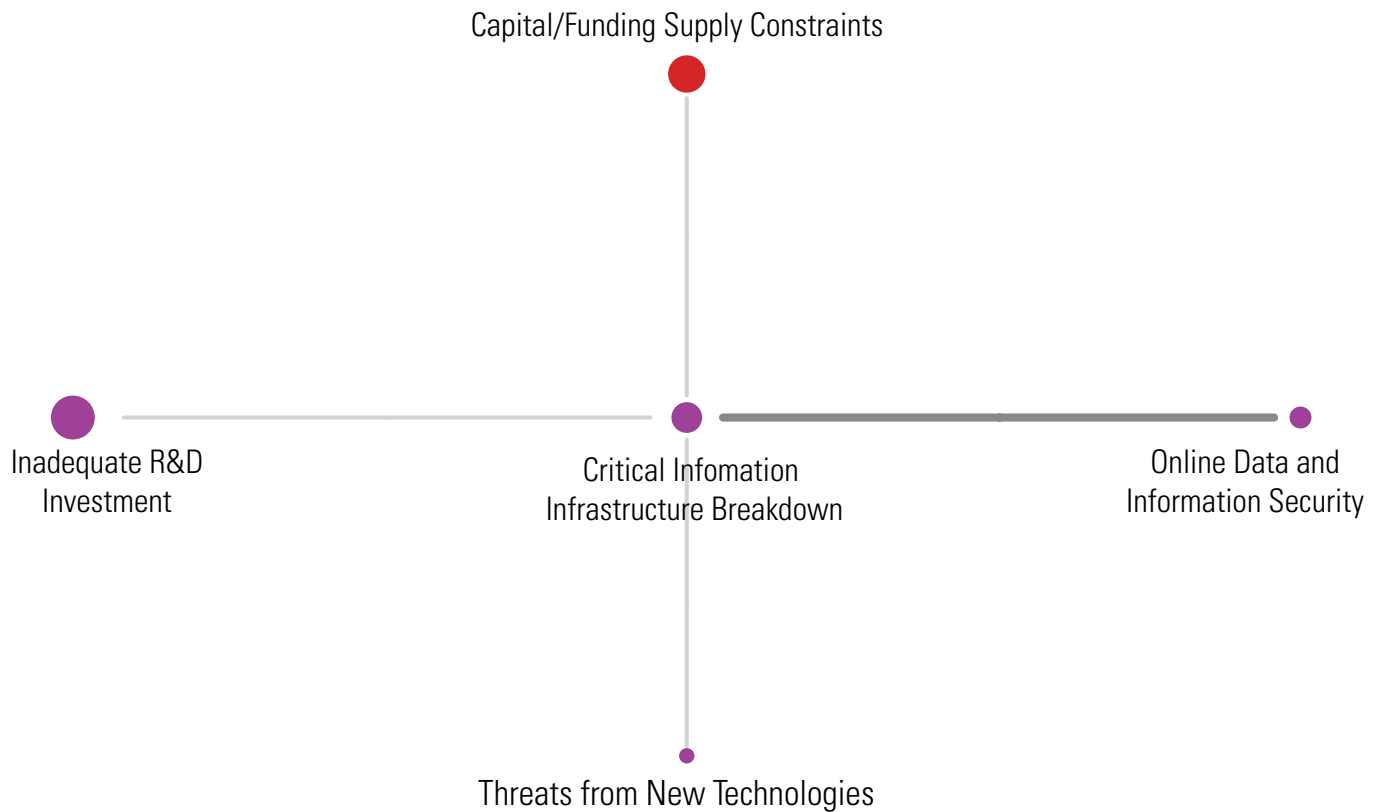
the importance of federal government funding of undergraduate university places and postgraduate research to Australia's scientific flowering in the second half of the 20<sup>th</sup> century.

The drive to bring a far higher proportion of young Australians into tertiary education has come with costs as well as benefits. The enormous increase in numbers means that government increasingly requires universities to find non-government income to fund places.

In recent years much of this income has come from overseas students – income that is now dropping sharply as the expense of an Australian education soars beyond the means of the middle classes in neighbouring countries. Perceptions of discrimination, especially towards Indian students, have not helped; nor have the criteria for obtaining international student visas. These were recently relaxed to some extent and are being reviewed by the federal government. In the meantime, universities in nations such as China increasingly offer appealing, high-quality alternatives.

For the past decade, policy and practice around research training has been geared to short – or medium-term outcomes in sciences and industry. Timelines are a problem: some research projects turn up little of commercial value in their first decade but deliver

## 10. CRITICAL INFORMATION INFRASTRUCTURE BREAKDOWN



remarkable results in their second. Yet many grants last only three to five years and skilled researchers spend too much of their time trying to secure funding.<sup>15</sup>

Research with obvious commercial applications is more likely to obtain funding than blue-sky programs of the kind that have led to significant breakthroughs in the past. Sometimes the “riskiest” research delivers the biggest innovations: research funding bodies should allocate a fixed amount to blue-sky projects.<sup>16</sup>

The word “innovation” is widely used but tends to be quarantined to sciences. Fostering humanities is not seen as a priority, and in the long term this will be to Australia’s detriment: we need to train rigorous, innovative thinkers across all disciplines.

To be able to lead in research and development, to keep critical information infrastructure up to date, and to protect against cyber attacks, Australia needs an adequate cohort of highly educated workers. Yet a recent report from the Department of Innovation, Industry, Science and Research has found that of OECD countries, Australia has one of the lowest proportions of higher-degree researchers employed in private industry. Demand for higher-degree research skills is expected to outstrip supply for almost all of the coming decade.

At the same time many of our brightest graduates are increasingly opting for careers in business rather than research: it has been suggested that this is because career paths for scientists in Australia are unclear, with many employed on short-term contracts and relatively poorly paid. A recent survey of 12,000 doctoral and masters research students at Australian universities found that 32 percent expected that they would have to work overseas.<sup>17</sup>

To prevent a continued exodus of research, development and design talent, we need to better value what these graduates have to offer. We should also aspire to attract research talent from overseas – another reason to raise remuneration, and to continue to fund well-equipped research facilities that do not have to operate under regular threats of withdrawal of funding.

The idea of establishing an Australian equivalent of “Silicon Valley” is not new but continues to have merit. Grouping innovators – whether they are working out of a university or in private enterprise – in a single physical location helps them concentrate skills and initiatives so that research can be transferred to successful start-ups.

A “Silicon Valley” destination could also help lift Australia’s innovation profile: despite Australia’s strong history of

research and development it is not seen internationally as a centre of technological excellence. Our present prosperity offers an opportunity to change that: to make long-term commitments to a technology culture in Australia.

We can also do more to exploit opportunities in the cyber world: to lead in IT security and information management and in online commerce.

For the longer term, ensuring a supply of workers equipped to excel in these areas depends in part on continuing programs to improve the teaching of maths and sciences in Australian schools, and fostering original thinking across all disciplines, from early childhood onwards. This is where opportunity begins, for individuals as well for Australia.

# About the Report

This report is based on both quantitative and qualitative analyses. The research methodology followed the same approach as *The Australia Report 2010*. The research commenced with a review of risks through discussions with KPMG and ADC Forum. As per the first report, risks were grouped according to five categories: economic, political, environmental, societal and technological.

Influential leaders from government as well as the academic, business and government sectors were then surveyed about their views of the likelihood and impact to the Australian economy of the 34 key risk areas (see risk categories on the following page). Respondents could focus on their specific area of expertise, or address all risks. They were requested to provide their estimate on a seven-point scale of the likelihood of each risk occurring, and an estimate of the severity of that risk to the Australian economy, as measured by the actual economic cost over the next 10 years. Each respondent then ranked the risk they considered to be most linked to that risk. This facilitated an analysis of the perceived relationship between risks, including the identification of the strongest dependencies and directional relationships between key risks. Ninety respondents provided data to the survey. Actuarial principles were then used to analyse the results.

The results of the survey then formed the subject of two discussion groups at the ADC Forum's 2011 Future Summit with the ADC Forum Australia Leadership Awardees on May 29, and then with ADC Forum attendees on May 31 to critically evaluate the risk landscape and discuss key opportunities.

In terms of survey design, again there were challenges in determining the appropriate degree of risk resolution

and granularity: the number of risks that could be practically included, the number of factors that each risk could accommodate, and which risks to omit. Care is therefore needed in interpreting the survey results which are not intended to reflect a statistically accurate estimate of the 'true' risks to the Australian economy. The sheer scale and difficulty in estimating the myriad of macro risks renders such a scientific approach somewhat spurious.

The survey does however provide a reflection of the views of influential thinkers and leaders of the various risks facing us over the coming decade. The linkages should also not be interpreted as evidence of cause or effect. The survey was designed to provide an illustration of the interdependence of key risks, not the identification of root cause.

Finally, the severity of each risk focuses on the economic impact of that risk over a 10-year horizon. Clearly, each of the risks will have numerous and equally important non-financial consequences to Australia's people, environment, governmental and societal structures, and other aspects of life. The financial focus provides a quantitative focal point common to all. It is hoped that the survey will provoke debate with the non-financial impact of these risks constituting a fundamental part of this discussion.



# Risk Categories & Explanations

Risk Title	Risk Description
<b>ECONOMIC RISK</b>	
Major Trading Partner Weakness	Risk of subdued economic activity in a major trading partner.
Capital/Funding Supply Constraints	Reductions and/or limitations in the availability of liquidity, loans and credit from banks and capital markets increase borrowing costs for governments, businesses and consumers, deter investment and negatively impact financial markets and economic activity.
Fiscal Crisis	Excessive debt burdens generate sovereign debt crisis with adverse impact on the Australian economy.
Asset Price Collapse	Collapse of real and/or financial asset prices, leading to the destruction of wealth, reduced household spending and impaired demand.
Pricing Essential Services	Inadequate pricing of essential services (health, aged care, social security) results in worsening government debt and/or an inability to deliver these services.
Commodity Price Volatility	Volatile mineral, metal and agricultural commodity prices create uncertainty for the government and for the businesses as well as costs for producers and consumers.
Regulatory Failure(s)	Inadequate, fragmented or excessive regulations, institutions or reforms negatively impact industry structures, capital flows and market competition, constraining both investment and innovation, and impede the effectiveness of international interaction.
Extreme Currency Volatility	Global instability and/or imbalances result in wide swings in currency rates.
Infrastructure Fragility	The failure to adequately invest in, upgrade and secure infrastructure networks severely hinders growth and development, and reduces the resilience of infrastructure networks to endogenous or exogenous shocks.
Energy Price Volatility	Volatile energy prices create uncertainty for governments and businesses as well as costs for producers and consumers.
Extreme Consumer Price Volatility	Volatile prices for consumer goods and services distort demand, create uncertainty for government and businesses, and increase costs for both producer and consumer.
<b>ENVIRONMENTAL RISK</b>	
Climate Change	Droughts, extreme temperatures and other chronic weather events caused by climate shifts cause harm to lives, human health, infrastructure, property, economic activity and the environment.
Flooding	Severe flooding causes harm to lives, human health, infrastructure, property, economic activity and the environment.
Storms and Cyclones	Storms, cyclones and other acute weather events cause harm to lives, human health, infrastructure, property, economic activity and the environment.
Firestorms	Increased frequency and/or severity of firestorms cause harm to lives, human health, infrastructure, property, economic activity and the environment.
Biodiversity Loss	The degradation of biodiversity results in stocks of renewable resources below regenerative capacity and reduced species diversity.

Risk Title	Risk Description
<b>POLITICAL RISK</b>	
Deterioration in Bilateral Relationships	Risk presented by the degradation of Australia's diplomatic relationships with another country.
Geopolitical Conflict	Military actions or aggressive foreign or trade policies on the part of global or regional powers disrupt political or social stability, negatively impacting populations, investment and financial markets.
Fragile States	Weak or inadequate global institutions, agreements or networks, combined with competing national and political interests, impede attempts to cooperate on addressing global risks.
Illicit Trade	Increases in the illegal trafficking of goods and people cause social, political, economic and environmental harm by increasing the burden on supply chains, exacerbating wealth inequalities and financing destabilising activities.
Social Disruption	An event caused by increasing social disparity, social unrest, differing ideologies or non-state actors (including terrorists) that results in large-scale damage to citizens, infrastructure, institutions or the economy.
Organised Crime	The unlawful activities of highly organised, disciplined associations weaken state authority, negatively impact investment climates, undermine the rule of law and slow growth.
Weapons of Mass Destruction	The proliferation of nuclear, chemical, biological and radiological technologies and materials leads to crises.
<b>TECHNOLOGICAL RISK</b>	
Critical Information Infrastructure Breakdown	Systemic failures of critical information infrastructure (CII) and networks negatively impact industrial production, public services and communications.
Online Data and Information Security	The accidental loss of data or fraud online triggers a loss of confidence in data sharing, negatively affecting e-commerce and communication.
Threats From New Technologies	Negative consequences for human, animal or plant life created when know-how, technologies, materials, or equipment are diverted to or developed specifically for malevolent purposes or when harmful substances are accidentally released.
Inadequate R&D Investment	The risk of R&D investment (public and private) being insufficient or inappropriately allocated.
<b>SOCIETAL RISK</b>	
Demographic Challenges	Ageing population threaten economic growth and result in fiscal deficits.
Migration	Migration flows exert economic and social benefits and costs on the country.
Water Security	Declines in the quality and quantity of potable water which threaten to undermine social harmony and economic development and promote intra-state conflict.
Economic Disparity	Wealth and income disparities threaten social stability as well as economic development.
Chronic Disease	Rising levels of chronic disease, such as obesity, cancer and heart disease, increase health costs and threaten productivity and economic growth.
Food Security	Inadequate or unreliable access to appropriate quantities and quality of food and nutrition threatens health outcomes and economic development.
Infectious Diseases	The incidence and patterns of both known and emerging infectious diseases shift to new regions and populations segments through a series of pandemics or sub-pandemic outbreaks, threatening the population's health and economic activity.

# Contributors & Acknowledgements

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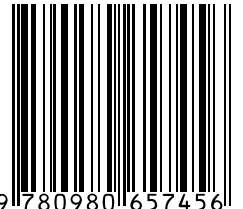
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