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The global transition to a two degree economy has begun. Here's how you can prepare.

GUIDE FOR BUSINESS

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1. Introduction

Climate change presents significant and unique challenges to the business models of many companies. Additionally, long term strategies to align with these goals are not regularly part of companies planning and reporting activities. Without the right tools boards, company management and investors are often unable to assess whether their companies are managing the risks associated with a transition to net zero emissions.

Pressure is increasing on companies and investors to plan for the global transition to a low carbon economy. Here are three key factors to consider.

Under the Paris Climate Change Agreement, 197 countries committed to keep global temperatures 'well below 2°C' and to pursue 'efforts to limit the temperature increase to 1.5°C'. This means taking action to get to net zero emissions by the second half of the century, or around 2050 for developed economies.

Corporate and financing decisions will be critical to achieving these goals but navigating the transition may present unique challenges for business and investors. Long term strategies to align with these goals are not regularly a part of company planning and reporting activities. However, companies that develop and execute smart strategies for transitioning to a net zero emissions world are likely to be better placed to pursue transition opportunities while mitigating against the climate and transition risks.

As a result, there is increasing pressure on companies from investors and regulators to prepare for the risks and opportunities around climate change and to develop clear strategies to manage the transition to a low carbon economy.

For example, the Financial Stability Board (FSB), under Bank of England Governor Mark Carney, has established a Task Force on Climate-related Financial Disclosures (TCFD). This effort stems from concerns about the stability of financial systems resulting from climate change transitions, given that markets can be vulnerable to abrupt corrections. The taskforce has recommended that companies include climate-related disclosures in mainstream financial reports on their governance, strategy, risk management, metrics and targets. It also recommends that companies undertake scenario testing to stress test these elements with assumptions in line with the two degree goal.

In Australia, climate pressure was accentuated in a recent statement by Geoff Summerhayes of Australian Prudential Regulation Authority (APRA). In it, he called for climate change risks to be included in financial institutions' internal risk management processes. In addition, the legal opinion on directors' fiduciary duties to consider the impacts of climate change should remind board members they could be found liable for breaching their duty of care and diligence in the future, if they failed to consider climate change risks that are considered foreseeable today.

This article proposes several key analyses which investors and companies will need to undertake in order to better prepare themselves for the transition.

2. Climate change presents both risks and opportunities for businesses and investors

For a preliminary assessment, companies can consider the emissions intensity and availability of low carbon substitutes for their sector, facilities and products.

There are many challenges that business (along with everyone else) must face in responding to climate change. However, particularly for those who respond more pro-actively, there are also significant opportunities.

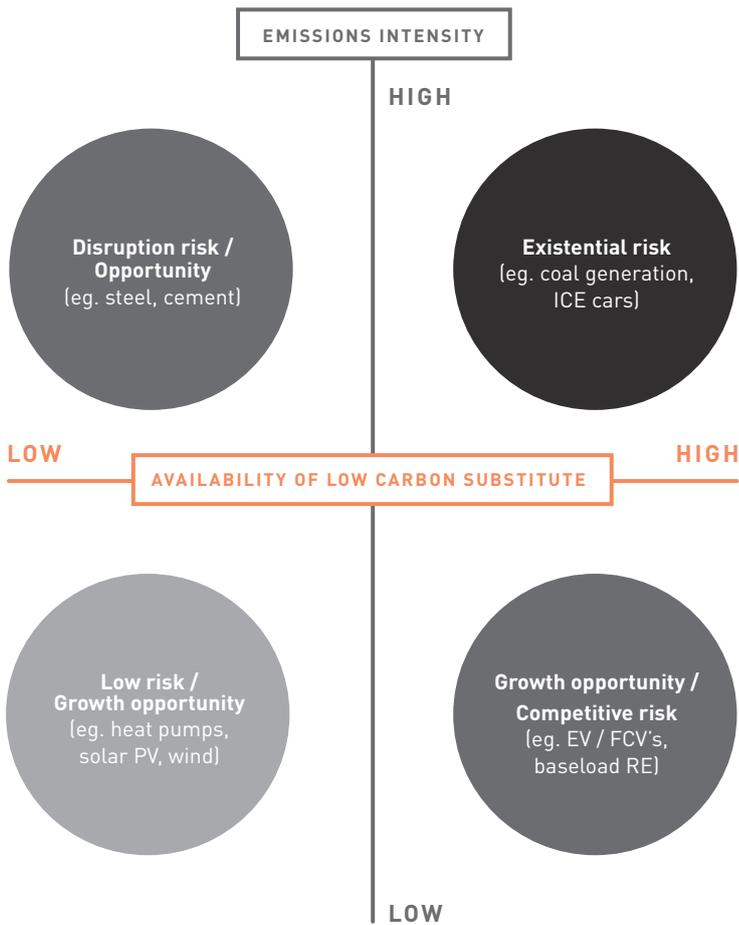
Potential risks include direct financial impacts from the transition to a low carbon economy such as reduced competitiveness and risk of stranded assets for emissions intensive goods, for example coal and petroleum. Major emitters that are slow to move relative to competitors and substitutes, such as manufacturers of emissions intensive vehicles or aluminium producers who use coal-based electricity are also likely to face high risks. These risks include risk of litigation, regulatory risks, impact on brand and intangible assets and risk of higher capital costs of financing. Failure to act early to address transition risks could lead to assets becoming uncompetitive, for example through prohibitive costs of accelerated retrofits to decarbonise operations.

Alongside the risks of the transition, however, there are also potential opportunities. Many technologies can be expected to increase in demand in a rapidly decarbonising economy including clean technologies such as solar PV and electric vehicles as well as their supply chains, for instance in areas like lithium and copper mining. The need for new business models can also create new opportunities and markets to capture, and early movers can benefit from enhanced reputation and product differentiation.

In addition, businesses can capture financial benefits from decarbonisation activities in their operations or supply chains such as improvements in energy or material efficiency, or shift from fossil energy to renewable energy sources.

The simple framework presented below can help companies and investors assess the likely magnitude of climate transition risks for their economic sector, facilities and products. For example, in the existential risk quadrant, coal-fired electricity generation has a very high emissions intensity, and there are many substitutes available, such as renewable electricity generation. An aluminium producer who uses coal-based electricity would be in the same quadrant, given that it would be very easy to shift to a hydro-based producer. Some risks are more subtle, for example the risks associated with steel and cement production. While currently there are few substitutes available (and in some cases none at all), there is a high risk of disruption given the high share that these two products are currently expected to consume of the global carbon budget. For example, timber is increasingly being used in high-rise construction. Risks also exist for low carbon products in the case where several substitutes exist. This could lead to price wars to decide which technology or product will win.

Figure 1. A simple framework to assess your climate transition risk



3. How can you base business decisions on a complex future?

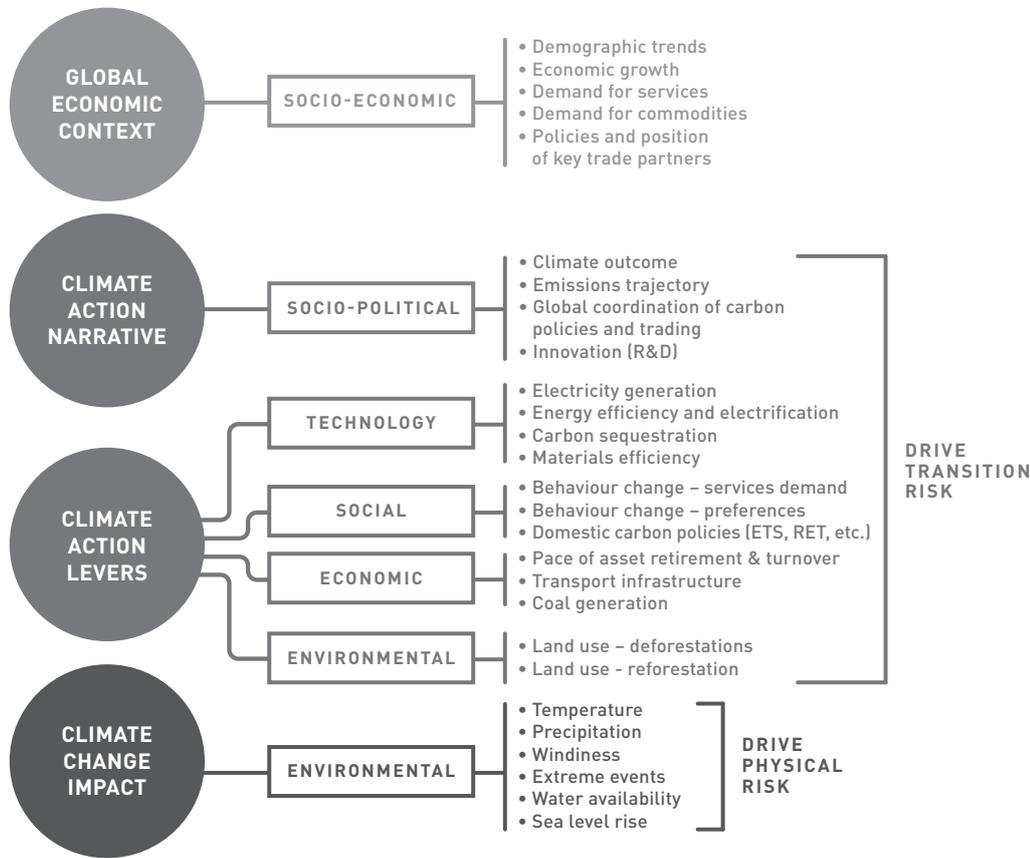
Climate change scenarios will play an increasing role in testing the impact of potential future outcomes. Designing scenarios involves choosing from many different parameters, from an economic context, to identifying specific climate action levers that can be pulled to achieve the desired climate outcomes.

Scenario testing can be a useful tool to quantify the potential impacts of decarbonisation on companies and investment portfolios. Climate change scenarios are highly complex due to the large number of uncertain variables across the political, economic and social environments in particular. This complexity means that there are many ways that decarbonisation could unfold. Scenario testing allows companies to quantify impacts on their operations in a number of possible future states.

Scenario parameters

ClimateWorks has developed the framework below (Figure 2) to help businesses and investors to understand the levels of assumptions in a climate change scenario.

Figure 2. Structure of the assumptions underlying a climate change scenario



The **Global Economic Context** sets the overarching environment under which the scenario takes place. This information is useful to compare or align the scenario with other modelling.

The **Climate Action Narrative** sets the tone for the overall decarbonisation pathway described in the scenario. These assumptions are mostly economy level, socio-political factors such as the overall global ambition of climate change policy, the degree of global coordination and the rate of technological innovation.

The **Climate Action Levers** are the micro-level assumptions that determine how the emissions reductions pathway is actually achieved through a mix of technological, social, economic and environmental actions. This includes choices on the role of electricity generation technologies such as nuclear, carbon capture and sequestration (CCS) and renewable technologies or the trade-off between food, energy and carbon production from land use. These assumptions should draw from the overarching narrative of the scenario. The Climate Action Narrative and Climate Action Levers will primarily drive transition risks (associated with the economic transition to a low carbon economy).

The **Climate Change Impact** is the function of the resulting emissions of the pathway and consider the unpredictability of extreme weather events and other impacts of climate change. The Climate Change Impact will primarily drive physical risks (risks to assets from changes in the climate).

Choosing scenarios

Identifying the right scenarios for your company or investment portfolio requires two steps: Assessing parameters most important to you, then exploring how best to assemble them.

Modelling multiple scenarios can help you understand the range of potential impacts on the performance of a business or portfolio of investments, given the inherent uncertainty of modelling long term emissions reductions pathways. Effective scenarios should be believable to those who are using them, they should be understandable so that they can be implemented effectively and they should have assumptions that are consistent with the context and narrative. The TCFD stresses the importance of including a 2°C scenario, in line with the Paris agreement.

The first step in deciding what scenarios are appropriate for a particular company or investment portfolio is to understand which parameters are going to have the most impact on the outcomes for this company or portfolio. Given that only a limited amount of scenarios can be analysed, making sure that the whole range of possible outcomes are covered is critical – both for key risks and for key opportunities. In order to do this, a mapping can be done of major scenario parameters against the key products/facilities/sectors of operations. It will be important to conduct a more detailed analysis for the elements which are particularly sensitive to changes in parameters. For example, a resource company will want to run scenarios around material efficiency or material substitution parameters, and a coal mining company will want to run scenarios around the future cost and availability of carbon capture and storage technologies.

Once key parameters are identified, the second step will be to decide on how to assemble them into scenarios. Different approaches exist. For example, it is possible to use a “central scenario” with moderate assumptions on several key parameters and then test a more extreme range of outcomes on either side for those key parameters to understand the range of potential futures. Another approach can be to explore the range of possible futures through distinct scenarios based on separate narratives. If done well, this approach can help exploring a similar range of possible outcomes with less, more easy to communicate scenarios. However it will require significant rigour to ensure the scenarios cover all key issues to explore.

Once scenarios are designed, companies need to assess the risks and opportunities associated with each. If capabilities and resources are limited, a first step could be to explore scenarios qualitatively, developing internal narratives around possible outcomes and accompanying strategies to mitigate risks and capture opportunities. Quantitative scenario data can also sometimes be sourced from publically available databases.

CASE STUDY:

Westpac Climate Change Scenario Analysis

During 2016, Ernst & Young and Climate Works Australia helped Westpac undertake scenario analysis to understand the longer term impacts of climate change to the Australian economy, including risks and opportunities for Westpac, in limiting global warming to less than 2°C.

Three scenarios were identified representing plausible pathways to a low carbon economy, based on different approaches to global cooperation and timing of action. Each scenario included assumptions for technological, social, economic and environmental factors, drawing from a broad base of existing research, including regarding carbon pricing. The scenarios were based on existing and known technologies due to difficulty in accurately modelling the impact of unknown innovations.

Summary of scenarios:

- **Strong National Action.** In this scenario, a lack of global carbon trading requires each country to

take ambitious action individually, requiring a more rapid domestic transition. National ambition drives technical innovation in renewables, carbon capture and storage and nuclear technologies.

- **Global Cooperation.** In this scenario, coordinated global action results in a smooth transition to a low carbon economy. Access to an international carbon trading system provides Australia with relatively cheap carbon permits compared to the other scenarios.
- **Delayed Action.** In this scenario, an initial delay towards action is followed by a much more accelerated mitigation pathway after 2030. This scenario assumes slower cost reductions of low carbon technologies due to lack of early investment and a rapidly increasing carbon price post-2030.

More information and key scenario insights can be found in [Westpac's sustainability report](#)

4. How organisations can develop their own decarbonisation strategy

When defining your decarbonisation strategy, you'll need to understand opportunities to reduce emissions existing both within and outside your operations. This includes considering relative costs and benefits and what potential pathways might look like.

To support the development of a decarbonisation strategy, several questions need to be answered:

- What is an appropriate range of emissions reductions for your operations/portfolio over different time frames?
- What opportunities exist within and outside your operations/portfolio to reduce emissions, and what are their relative costs and benefits?
- What possible decarbonisation pathways exist, and what are their relative costs and benefits?

The order in which these questions are answered will depend on the ambition or goal of your individual company. For example, some companies will prefer to set emissions reduction targets first, then develop one or several pathways that can deliver on those targets. Other companies might choose to first identify several potential pathways, before deciding on targets appropriate to them. This decision will be guided by the context in which your company operates. For example, it may depend on whether climate risks are existential or minimal, whether strong competition exists amongst peers on climate action ambition, or whether (and what) resource constraints may impact the internal transition.

Emissions reduction targets

There are several approaches you can take if your company decides to set a target before investigating emissions reduction options.

The Science-Based Targets initiative¹ presents several methods which can be used to develop an emissions reduction target in line with the level of decarbonisation required to keep global temperature increase below 2°C.

The more detailed method involves aligning emissions reductions in your company/ portfolio to the specific emissions reductions required in your sectors of operation.

More specifically, the method is based on the IEA 2DS scenario, which provides a 50% chance of keeping global warming below 2°C. Several other methods are presented, including aligning absolute emissions reductions or emissions per \$ profit to global trajectories in a transition to 2°C.

Rather than recommend taking a single perspective when defining a target, it is suggested that you instead consider your target from a range of perspectives. This is the only way to ensure it is really in line with science.

This can be done by comparing several metrics (eg. absolute emissions reductions, emissions per \$ profit and emissions reduction trajectory) to several relevant benchmarks (eg. emissions from the whole sector globally, emissions from the whole sector in OECD countries, global energy emissions, etc). In addition, if the identified target is based on the IEA 2DS scenario, you need to ensure that target still stands when compared to alternative scenarios with a higher likelihood of achieving 2°C, or compared with a different technology mix. Exploring such perspectives can be a complex process, but will ensure the target chosen is robust and can stand up to scrutiny by investors and climate experts.

As an alternative approach, your company could set a long-term net-zero target by or before 2050, given that doing so:

- is consistent with limiting global warming to 1.5 - 2°C;
- allows for flexibility in approach, including the capacity to respond to changes in policy or technological developments, by not relying on a technology-specific path;
- supports long term planning which can prevent 'locking in' high emissions assets or equipment;
- will be clear and easy to communicate to stakeholders (a rapidly growing number of organisations and jurisdictions have explicitly identified 'net zero emissions by 2050' as their target, and it is thus rapidly becoming more widely understood).

¹ A collaboration between CDP, World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UNGC), see <http://sciencebasedtargets.org/>

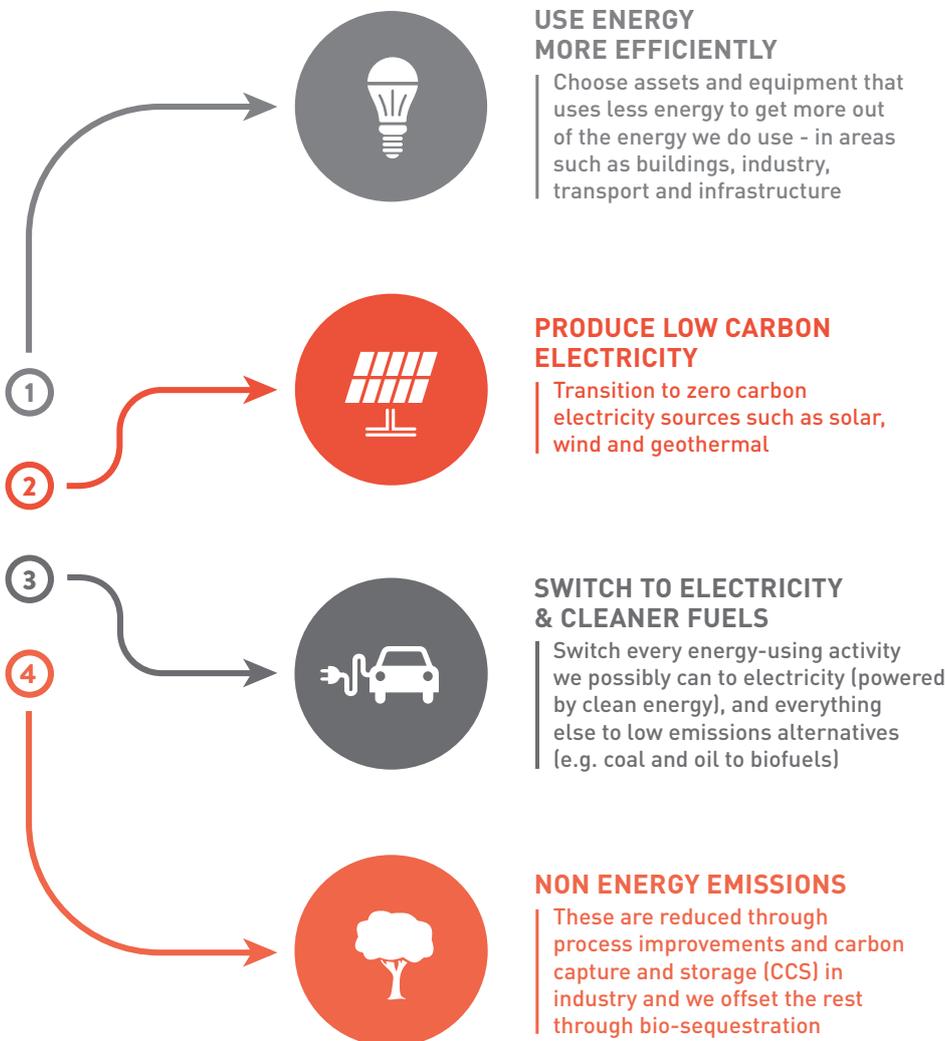
How to decarbonise a business or investment portfolio

Opportunities to reduce emissions sit under four steps or 'pillars' of decarbonisation: energy efficiency, low carbon electricity, switching to electricity and cleaner fuels, and non-energy emissions.

It is important to identify how the decarbonisation of a business or investment portfolio can be achieved and the implications this has for business decisions in the short, medium and long term.

Decarbonisation can be achieved through four steps or 'pillars' of activity.

Figure 3. The four pillars of decarbonisation



The first pillar, **use energy more efficiently**, involves doing more with less energy inputs. This can be achieved through efficient equipment, process redesign and optimisation, maintenance and behaviour change or process controls. This pillar can result in significant cost savings through lower energy expenses.

The second pillar, **produce low carbon electricity**, allows more efficient processes to be run on zero-emissions electricity, generated through low emissions technology such as renewable energy.

The third, **switch to electricity and cleaner fuels**, can reduce or eliminate emissions from many processes running on fossil fuels by switching to lower emissions fuels such as bioenergy or to low carbon electricity from renewables.

The final pillar, **non-energy emissions**, can be actioned through a variety of process improvements or through sequestration in the land or geology.

Many opportunities will exist to reduce emissions from current operations or investments, for instance, through implementation of ambitious energy efficiency, and installation of solar PV on existing assets.

Those opportunities offer the dual benefit of delivering emissions reductions and increasing the resilience of existing assets by reducing their intrinsic carbon intensity. They also reduce exposure to future energy price rises and improve competitiveness through reduced operating costs and modernised equipment. It is also worth investigating opportunities that may exist beyond the boundaries of current operations and assets, in order to understand the full costs/benefits of decarbonisation. This could, for example, include Power Purchase Agreements with renewable electricity generators, or the purchase of offsets.

Development of decarbonisation pathways

Once all opportunities have been identified and costed, several decarbonisation pathways can be investigated. Examples include:

- Fastest possible decarbonisation
- Maximum decarbonisation with net zero cost
- Maximum internal decarbonisation, then external options to get to net zero cost
- Several options to achieve given target or trajectory

For each pathway, decisions will need to be made around the scale/pace of implementation of decarbonisation opportunities. It will be important to take into account the point at which the opportunity becomes profitable, or whether there is a need to test the new technology before large scale implementation. For instance, it might make sense to run pilot programs before a new technology becomes profitable, so that your company is ready to scale up implementation once profitability is achieved.

Other important factors include assessing the capital required and the net cash flow of the combination of actions. As an example, it could be worth considering starting out implementing some highly profitable options in the first few years, in order that savings generated can be invested in some higher cost options, later on. Alternatively, opportunities that are profitable along with opportunities that come at a net-cost could be implemented in parallel, so that the overall NPV of the combined action remains positive.

Importantly, optimal pathways will look very different from company to company, depending on their unique circumstances and goals.

5. Join the leaders in a world on the move

Leading companies are already positioning themselves for the transition in order to capture the many benefits and advantages available to early movers.

Already 87 of the world's largest companies such as IKEA, Apple and Google have made a commitment through RE100 to go 100% renewable. The We Mean Business coalition represents companies with more than US\$8 trillion in revenue and investors with more than US\$20 trillion in assets under management. By following the three steps presented in this guide, companies and investors can prepare themselves for a decarbonising economy and follow current leaders in capturing opportunities along the way.

If you'd like to talk about deep decarbonisation and what it means for the world, Australia and your company, don't hesitate to contact us.

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