

# Green growth in New Zealand: an introduction

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**Report prepared for New Zealand Green Growth Charitable Trust**

Report  
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# 1 Introduction

Among the objectives of a green growth strategy are prosperity, sustained environmental quality and biodiversity, a low-carbon economy and resilience to the unavoidable impacts of climate change. This is a basket of objectives and it deserves a unifying architecture to give it coherence.

What a green growth strategy does is to maintain and enhance stocks of natural and man-made wealth so that living standards continuously improve into the future. What it does not do is to boost the economy at the expense of depleted assets.

Pure Advantage has commissioned Vivid Economics and the University of Auckland Business School to develop an architecture which organises the elements that make up green growth, and to use it to assess the opportunities from green growth, select and measure indicators, and report on New Zealand's opportunities and performance.

This short briefing paper introduces topics which will be addressed in the forthcoming full report, and begins to explore the answers to three questions:

- What are the opportunities from green growth and what are the benefits for businesses, households and communities?
- What are the measures of success?
- How well is New Zealand doing?



## 2 What is green growth?

Green growth has been described by the OECD as economic growth that is ‘strong, fair and clean’.<sup>i</sup> The term ‘green growth’ has been in use for at least a decade, but it gained widespread use after the global financial crisis of 2007-08. It was at this time that many governments around the world became attracted to policies claiming to support economic recovery while enhancing the environment. Although the language is recent, the ideas build upon a large body of research spanning several decades.

There are a number of green growth definitions and the similarities between them are strong. They share a common concept: a green economy maintains or improves wellbeing and stays within ecological constraints.<sup>ii</sup> They are also similar in their breadth, extending beyond the economy and emissions of greenhouse gases to biodiversity and mineral resources.

Green growth and sustainable development are complementary concepts. They share a similar root which is apparent in their definitions. The most widely-used definition of sustainable development is the Brundtland definition: ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.<sup>iii</sup> This is very closely related to the concept of green growth, and those differences which do exist, revolve around emphasis.

Green growth definitions generally emphasise the economy and markets, both as engines of growth over the short and longer term, and as vehicles for delivering improvements in environmental outcomes. Sustainable development definitions generally emphasise equity between current and future generations. The OECD’s Green Growth Strategy Co-ordinator, Nathalie Giouard, has described sustainable development as a ‘grand paradigm’ from which green growth strategies emerge as a more explicit, concrete agenda.<sup>iv</sup>

Some of the important contributions to thinking have come from academics, and others from the major multi-lateral institutions such as the United Nations Environment Programme. The institutions have large, ongoing work programs to help policy-makers and citizens understand, measure and achieve green growth.



## 3 Green growth's effects on the economy

Some of the principal benefits of green growth lie outside the conventional measures of economic growth. Economic growth is typically measured as a change in real gross domestic product (GDP). This is the change in the inflation-adjusted value of goods and services produced in an economy over a given time period. It does not capture expansion or contraction of the economy's stocks of ordinary 'physical' capital such as machinery, natural capital such as clean air and water, nor stocks of knowledge. This means that movements in GDP do not reveal whether growth has been achieved by depleting wealth or by keeping its value intact.

Green growth measures, on the other hand, look closely at assets. Similarly, green growth strategies aim to maintain the stocks of important natural capital that humans depend on for survival, so that increases in living standards can continue into the future. If these strategies are successful, some of their most important benefits will be a high quality of environment and a more equitable distribution of the gains from growth.

This means that, when measuring performance, it is necessary to look beyond growth. A first step is to account for changes in assets, and thereby to find out how much of observed growth is attributable to asset consumption or accretion. Other potential measures of green growth are mentioned below.

Although many benefits of a successful green growth strategy will be reflected in other measures, green growth policies may also increase measured rates of economic growth per person. To understand how green policies can raise growth, economists think about the timeframes different policies operate over and whether a green growth policy primarily affects the level of supply or demand in the economy (noting that the two are inter-related). Understanding these mechanisms can make a dialogue about what green growth policies can achieve more fruitful.

For example, if in the short run there are spare resources in the economy, a boost to demand can increase the measured level of growth. The US chose this route and applied a fiscal stimulus. As part of this policy, it directed funds to insulate housing of low-income earners.<sup>v</sup> In addition to creating employment during a severe downturn, these kinds of policies can lower greenhouse gas emissions and energy bills and make houses more comfortable to live in.

In some cases, an increase in the measured rate of growth over the short or medium term can result from pricing under- or non-priced natural resources. For example, the introduction of tradable property rights for agricultural water allows these resources to be used by the people that can derive the most value from them, which can result in a once-off rise the value of measured output, and a temporary increase in the rate of growth.

There are other examples where the effects emerge over the long term. For example, strong global efforts in investing in emissions reductions now will reduce the risk that climate change impacts reduce living standards in the future.<sup>vi</sup>



Some of the main opportunities associated with green growth are greater productive efficiency, increased income from trade and greater enjoyment of the environment. Table 1 illustrates these opportunities and how different types of opportunity would be expected to occur at different points in time.

Table 1. Opportunities from green growth

Now	Building up through coming decades	In the second half of the century and beyond
		Reduced risk of severe damages from climate change, spanning regional ecosystems, livelihoods and amenity
	Early action lowers the costs of meeting emissions reductions targets <sup>(a)</sup>	
Reduced air and water pollution improves wellbeing through human health and greater enjoyment of natural environments		
Comparative advantage in certain green and low-carbon goods and services		
Improved resource efficiency which frees up wealth for other uses		

Note: <sup>(a)</sup> see for example IEA estimates of the cost of delaying global action to meet the goal of limiting temperature increases to 2 degrees Celsius above pre-industrial levels in IEA, *World energy outlook 2010* (Paris: IEA, 2010).

Source: Vivid Economics



## 4 New Zealand's performance

A useful set of measures of green growth is the outcome of some careful choices. Any indicator that is easy to measure and clearly linked to policy could be useful. There are two broad approaches to measurement. In the first, a single measure is chosen to represent a country's performance. In the second, a collection of measures describes a variety of aspects of green growth. The first approach is rather ambitious and forgoes a richness of detail. It is no surprise that New Zealand uses a number of measures in its State of the Environment and sustainable development reporting, and the OECD is doing the same in its current work on green growth indicators.<sup>vii</sup>

Drawing on recent OECD work,<sup>viii</sup> indicators for green growth can be fitted into three broad categories:

- strength and nature of conventional economic growth;
- environmental quality, resource productivity and the natural asset base;
- capacity to generate green growth in the future.

Measures in the first two groups are generally well established. Some indicators within these themes of particular interest for NZ are labour productivity, water availability and quality, and greenhouse gas emissions.

While NZ's rate of productivity growth has been above Australia's overall for much of the past two decades, there remains an income gap between Australia and NZ. Growth will have to accelerate if the gap is to be closed.<sup>ix</sup>

Further increases in water use without efficient allocation could present future problems. The OECD recommends making water consents in NZ tradable, and has noted that, in some regions where demand for water exceeds supply, important uses such as household water are constrained because consents have been allocated to less valuable uses.<sup>x</sup>

Stable national performance in some water quality indicators also masks variations across regions. For example, over the period 1998-2007, there were no significant changes in the nitrogen concentration in two thirds of river sites, but the proportion of sites that deteriorated was double the proportion that improved.<sup>xi</sup> The OECD has praised the NZ Emissions Trading Scheme (ETS) as a 'bold initiative', but found that it was important to make the price signals in the ETS stronger.<sup>xii</sup>

While NZ is on track to meet its Kyoto Protocol target, net emissions under current policy setting are projected to rise sharply after 2015, partly because forests which have been absorbing carbon from the atmosphere are due for harvest.<sup>xiii</sup> Purchases of emissions reductions from overseas can contribute by closing part of the gap between NZ's projected 2020 net emissions and target (figure 1), but it is important to achieve a balance between domestic and international abatement. If there are opportunities for low-cost domestic emissions reductions that are not realised, NZ's reliance on international permits would be unnecessarily high, leaving the country overly exposed to potential increases in global carbon prices, and vice versa.

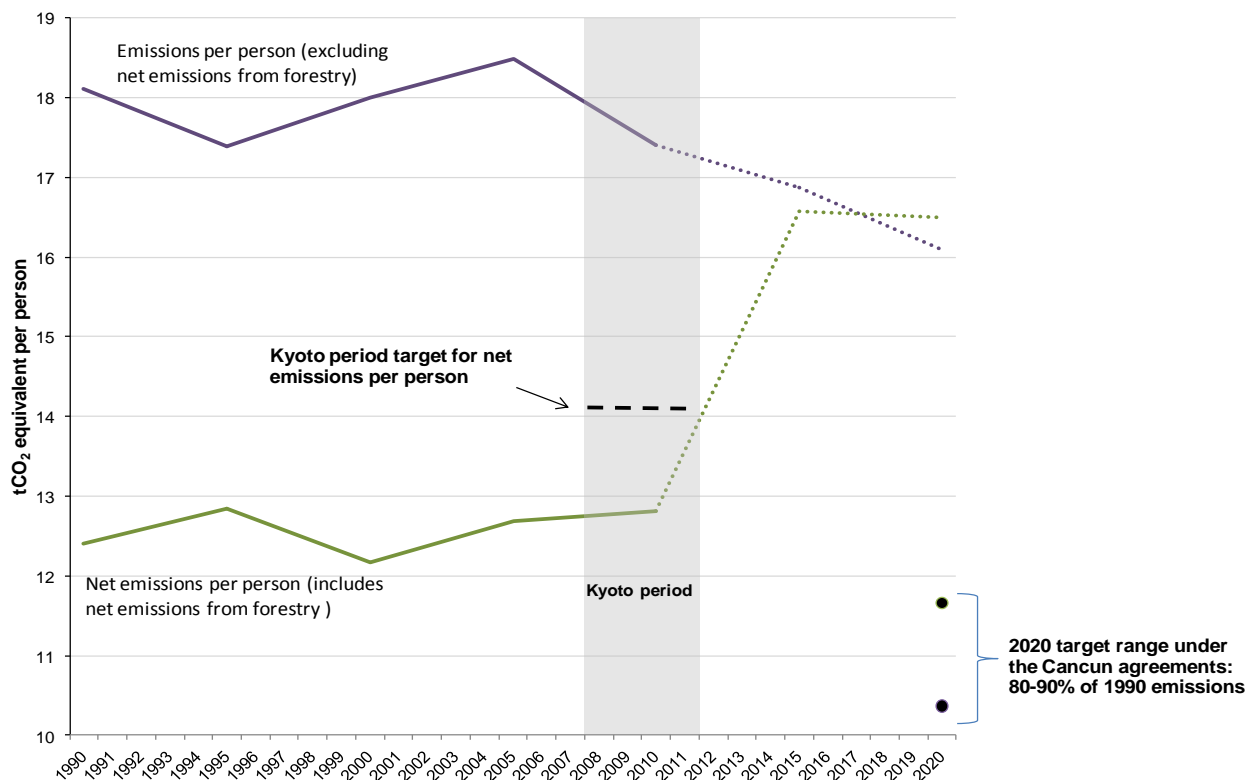


NZ's targets for emissions reductions do not position the country as a climate change leader. NZ's most ambitious 2020 target would reduce emissions per person by 18 per cent on 2005 levels by 2020.<sup>xiv</sup> NZ's percentage reduction in per person emissions is lower than both:

1. the percentage reduction in per person emissions over the same period in the European Union and Japan, whose starting levels of emissions per person are comparable to NZ's;
2. the percentage reduction in per person emissions over the same period in Indonesia, Brazil, Mexico and South Africa, where lower incomes per person mean less capacity to contribute to the global effort to reduce emissions.<sup>xv</sup>

NZ's long-term targets are even further behind the leaders. NZ has a target of reducing emissions by 50 per cent on 1990 levels by 2050.<sup>xvi</sup> The UK has a legally binding target of 80 per cent of 1990 levels by 2050, and Australia recently agreed the same target.<sup>xvii</sup>

Figure 1. New Zealand's gross and net national emissions per person



Note: projections of net emissions are the 'with measures' series from New Zealand's fifth national communication under the United Nations Framework Convention on Climate Change; population projections are the 'medium' scenario for each of fertility, mortality and net migration.

Source: Vivid Economics calculation using emissions data and projections from Ministry for the Environment (2009) and population data and projections from Statistics New Zealand.



The measurement of future capacity for growth is harder. While it may be tempting to focus on the share of output and jobs in green technologies, in reality New Zealand will continue to produce and consume many of the things produced and consumed now, but in more sustainable ways. In a low-carbon future, all jobs will be greener in some way, even if only a small share of the workforce is directly involved in research and development into green technologies. One of the questions arising in this area is how important employment in green industries might come to be in New Zealand relative to other aspects of green growth.

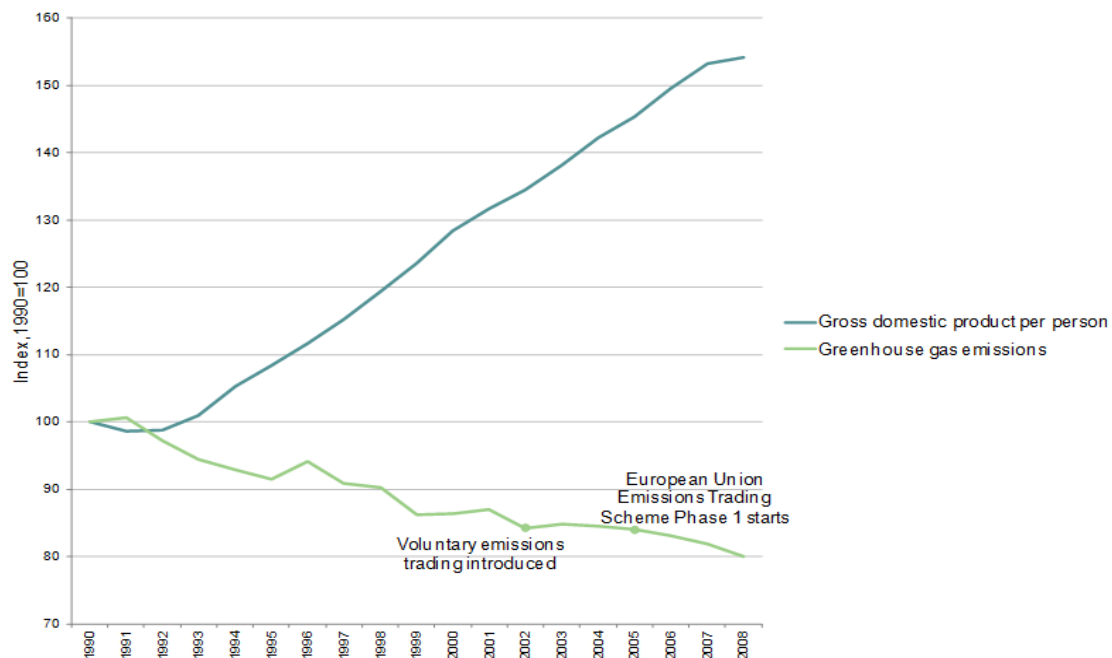


## 5 Is it possible to grow and be green?

Over the past two decades, some countries have reduced emissions and built up GDP per person. For example, figure 2 shows these trends for the UK.

Looking forward, countries representing over 80 per cent of world emissions and around 90 per cent of world output have pledged emissions reduction targets and/or actions for 2020.<sup>xviii</sup> Consistent with examples of successful past emissions reductions in countries such as the UK, economic projections from a range of sources indicate that these 2020 targets can be achieved at the same time as growth in income per person.<sup>xix</sup>

*Figure 2.* Economic growth coupled with reduced greenhouse gas emissions in the UK



*Note:* GDP in US dollars and Purchasing Power Parity terms; greenhouse gas emissions excluding emissions from Land Use, Land Use Change and Forestry.

*Source:* Vivid Economics calculation using GDP data from the IEA and greenhouse gas data from United Nations Framework Convention on Climate Change.



## 6 What are other countries doing?

New Zealand's trading partners have implemented or are planning a large variety of policies to reduce greenhouse gas emissions and protect important natural resources. Within the OECD, countries representing 44 per cent of OECD output already have a national-level emissions trading schemes or carbon tax, or plan to introduce one.<sup>xx</sup> Price-based policies are not restricted to developed countries. India has a coal tax which funds research and development on renewable energy. China has a value-based tax on coal, oil and gas extraction in its largest gas-producing province and plans to extend it to all other western provinces.<sup>xxi</sup>

These pricing policies are complemented by many additional environmental policies. For example, in a survey of emissions reduction policies in the electricity and transport sectors of nine major economies, the Australian Productivity Commission found more than 1,000 policies in operation.<sup>xxii</sup> As with all public policy, the design and implementation of these policies is very important. Poorly designed or implemented environmental policies impose economic costs while producing only small positive or possibly even adverse environmental effects. While the effectiveness and efficiency of emissions reduction policies in particular varies widely both across and within countries,<sup>xxiii</sup> those policies that are well-designed and implemented are positioning countries for green growth now and over the longer term.



## End notes

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- <sup>i</sup> Alexandra Bibbee, “Green Growth and Climate Change Policies in New Zealand,” OECD Economics Department Working Paper no. 893 (2011).
- <sup>ii</sup> See for example OECD, *Towards green growth*, May 2011, United Nations Environment Program, *Towards a green economy: pathways to sustainable development and poverty eradication*, 2011, Earth Summit 2012 Stakeholder Forum, *Introductory briefing note: the green economy*, 2011., Alex Bowen and Samuel Fankhauser, “The green growth narrative: Paradigm shift or just spin?,” *Global Environmental Change* (August 2011), UNESCAP, “Green growth”, n.d., <http://www.greengrowth.org/>.
- <sup>iii</sup> World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987).
- <sup>iv</sup> OECD, “Green growth strategies: a framework for the future, and the present”, n.d., <http://oecdinsights.org/2011/02/11/green-growth-strategies-a-framework-for-the-future-and-the-present/>.
- <sup>v</sup> Department of Energy, “Weatherization Assistance Program”, n.d., <http://www1.eere.energy.gov/wip/wap.html>.
- <sup>vi</sup> See for example Nicholas Stern, *The Economics of Climate Change: the Stern Review* (Cambridge: Cambridge University Press, 2007).
- <sup>vii</sup> Ministry for the Environment, *Environment New Zealand 2007, Environment*, 2007, Statistics New Zealand, *Measuring New Zealand’s Progress Using a Sustainable Development Approach*, 2008, OECD, *Towards Green Growth: Monitoring Progress*, 2011.
- <sup>viii</sup> *Ibid.*
- <sup>ix</sup> 2025 Taskforce, *Focusing on Growth: the second report of the 2025 taskforce*, November 2010, pp. 25-6. Comparison of the overall growth rates of Australian and NZ labour and multifactor productivity 1986-2008 using the sectors for which a robust and meaningful measure of productivity can be calculated (the ‘measured sector’).
- <sup>x</sup> Bibbee, A (2011), pp.10, 31.
- <sup>xi</sup> Ministry for the Environment, “Nitrogen levels in rivers – national network and regional council sites”, n.d., <http://www.mfe.govt.nz/environmental-reporting/freshwater/river/nutrients/nitrate/national-and-council.html>.
- <sup>xii</sup> Bibbee, A (2011), p.2, 22.
- <sup>xiii</sup> Ministry for the Environment, *New Zealand’s Fifth National Communication under the UN Framework Convention on Climate Change*, 2009.
- <sup>xiv</sup> Vivid Economics calculation using emissions data and projections of net emissions ‘with measures’ from Ministry for the Environment (2009), *New Zealand’s fifth national communication under the United Nations Framework Convention on Climate Change* and population data and projections (the ‘medium’ scenario for each of fertility, mortality and net migration) from Statistics New Zealand.
- <sup>xv</sup> Frank Jotzo, “Comparing the Copenhagen emissions targets”, CCEP Working Paper 1.10, 2010, p.31.



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<sup>xvi</sup> Ministry for the Environment (2009), p.5.

<sup>xvii</sup> HM Government, *Implementing the Climate Change Act 2008: the Government's proposal for setting the fourth carbon budget: policy statement*, Change, May 2011, p.6; Commonwealth of Australia, *Securing a clean energy future: the Australian Government's Climate Change Plan*, 2011, p.xi. Australia's 2050 target is expressed 80 per cent below 2000 levels, which is also 80 per cent below 1990 levels.

<sup>xviii</sup> Department of Climate Change and Energy Efficiency, *Status of global mitigation action: current targets and policies in key countries*, 2010.

<sup>xix</sup> See for example the summary of results from a range of global modelling exercises on p.41 of Commonwealth of Australia, *Strong growth, low pollution: modelling a carbon price*, 2011.

<sup>xx</sup> Vivid Economics calculation using 2010 GDP data in US dollars and Purchasing Power Parity terms from the OECD and information on emissions policies from Australian Government (2010).

<sup>xxi</sup> Department of Climate Change and Energy Efficiency, *Status of global mitigation action: current targets and policies in key countries*.

<sup>xxii</sup> Productivity Commission, *Carbon Emission Policies in Key Economies*, (Canberra, May 2011).

<sup>xxiii</sup> Ibid.

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