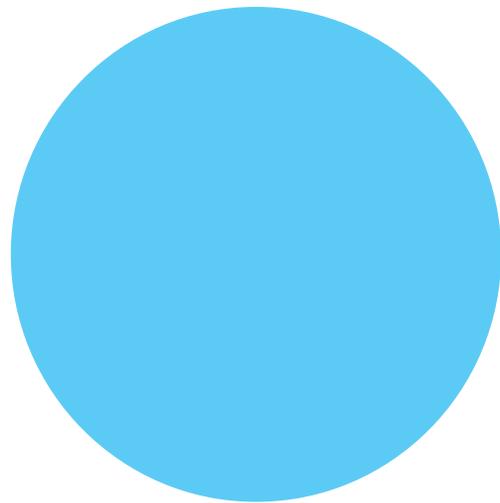




The Climate Institute

Global Climate Leadership Review 2013

Global Climate Leadership Review 2013



This report provides The Climate Institute's overview of Australian climate policy in a global context. It aims to elaborate on the implications of global climate diplomacy and domestic actions for Australia.

The *Global Climate Leadership Review 2013* and interactive Low-Carbon Competitiveness Index can be accessed at www.climateinstitute.org.au.

The lead author for this report is Erwin Jackson, Deputy CEO of The Climate Institute, with contributions from other staff and using research from Vivid Economics.

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Foreword

Foreword

This second *Global Climate Leadership Review* provides important perspective beyond the all too compelling but ultimately limiting national political battlegrounds. They are important but too much attention on these debates can miss the fundamental trends moving beneath us.

Global action on climate change isn't just international agreements, though some delicate but important progress has been made in recent years towards an agreement by 2015 that covers emission commitments for all major emitters.

Global action isn't just national policies, though many steps forward are being taken by major economies as they pursue self-interested goals to clean up air pollution and jockey for clean technology leadership. Global action isn't just business investment, though investment in clean energy is changing markets and cutting costs.

Global action isn't even necessarily obviously environmental in intent: energy efficiency, energy security and energy productivity goals are pursued irrespective of their emissions benefits.

Global action is taking place against a backdrop of growing extreme weather events and alarming scientific findings. These have prompted the normally conservative World Bank, International Energy Agency and others to more and more strident calls to action to minimise climate impacts on economic prosperity and community wellbeing.

The realisation is slowly dawning that future economic prosperity will depend upon carbon and energy productivity as much as, if not more than, traditional measures of productivity. Whether we like it or not, the need to produce economic outcomes while limiting carbon pollution will reshape societies and economies.

The Climate Institute/GE Low-Carbon Competitiveness Index is a measure of how countries in the G20 are placed to achieve prosperity in a carbon-constrained world.

This year's index demonstrates ongoing global action but with some of the biggest improvements in the emerging economies, in particular in Asia. It shows a fragile reversal of years of decline in Australia's carbon competitiveness. This highlights the importance of building on recent achievements that price and limit carbon as well as encourage investment in clean energy.

The Index and this report are part of The Climate Institute's ongoing research program which wouldn't be possible without the broad support of groups such as GE and the British High Commission who have contributed to this project.

**John Connor, CEO
The Climate Institute**

Aim+ Approach

Aim

The Climate Institute's *Global Climate Leadership Review 2013* puts Australian climate policy in the context of ongoing international action to address climate change. The second in our annual series, the 2013 Review examines international action across several strands: it identifies which nations are leading the transition to a low-carbon economy; the dynamics and outcomes of intergovernmental climate negotiations; and the implications of all of these for Australia.

The Review is one of The Climate Institute's flagship projects, and as such sets the scene for 2013's ambitious research program. With ongoing support, The Climate Institute will publish further flagship research throughout the year. Subsequent reports aim to cover carbon investment best practice, public attitudes to climate change and climate policy, and the costs of failure to prepare for climate change.

Approach

The Climate Institute engaged recognised leaders in climate change economics and policy to undertake the analysis underpinning the *Global Climate Leadership Review 2013*. The Climate Institute also drew on the international experience and networks of its staff to provide insights on global trends. The Institute engages with the process of intergovernmental negotiations each year to inform its analysis of the implications of international decision-making.

The photographs used in this report are by The Climate Institute's Creative Fellow Michael Hall. All images except the one of impacts of bushfires in Tasmania are part of a photo essay documenting climate change, its impacts and solutions, in China. Michael shot this work in late 2012. More details can be found on our website, www.climateinstitute.org.au.

The Climate Institute continues to explore innovative ways of communicating the complex issues of climate change as simply and effectively as possible. *The Global Climate Leadership Review 2013* is complemented by two interactive online tools: The Climate Institute/GE Low-Carbon Competitiveness Index data visualisation and a regularly updated global map detailing each country's climate-related actions. These can be found on our website.

A large white wind turbine stands prominently in the foreground of a vast, flat, arid landscape. The turbine's tower is marked with the 'Gamesa' logo at the top and the Chinese characters '龙源电力' (Longyuan Electric) further down. In the background, a line of similar turbines stretches across the horizon under a clear, bright sky. A dirt road leads towards the turbines, and a small utility box is visible near the base of the main turbine.

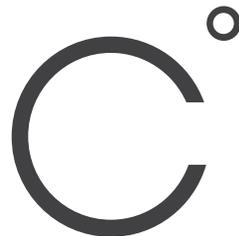
The momentum for climate action has shifted away from Europe and the United States towards the emerging economies of Asia.

► One of the many wind farms in the Hexi Corridor, in remote Gansu province, China. Although it is the world's biggest CO₂ emitter, China is also erecting 36 new wind turbines a day and building a robust new electricity grid to supply the cities of the east with renewable energy from the deserts of the west.

Key Findings

Overview

+ Megatrends towards greater international action on climate change continue but at an insufficient pace. For example, weighted average effective carbon prices on energy in OECD countries are currently PPP* \$34 per tonne and global clean energy investments, particularly in Asia, remain high and reached \$US270 billion in 2012. However, even with current commitments, the world is still on the path to a global temperature rise of 3-4°C, well beyond the risky “guardrail” of 2°C.



+ Countries differ in their ability to prosper in a world moving to limit pollution. The Climate Institute/GE Low-Carbon Competitiveness Index indicates that France, Japan, China, South Korea and the United Kingdom are currently best positioned to prosper in the global low-carbon economy. (Figure 3.0 pp 23-24)



+ Since the previous update of the Low-Carbon Competitiveness Index, China has leapt ahead and the United States has begun to fall behind. China’s dramatic rise up the Index is the result not only of its major investment in clean energy, but also growth in its high technology exports. China hosted just under half of total global public equity investment in clean energy.



+ Australia has seen a fragile reversal of its score on the Low-Carbon Competitiveness Index. However, Indonesia improved more to overtake Australia, which is now 17th in the G20. The data does not, however, include the impacts of the recently implemented Clean Energy Future package.

*National currencies, other than US dollars, have been converted to international dollars (PPP, 2010). The purchasing power parities (PPP) conversion factors are from <http://data.un.org/Default.aspx>.

Summary

Global investment in clean energy

In the aftermath of the 2009 UN Copenhagen meeting, countries continue to implement policies that slow the growth in carbon emissions and encourage investment in clean energy. They are doing this because of concerns about climate change and other self-interested reasons, including addressing local air pollution, improving energy productivity and energy security and building new industries. While the spread and scale of current policy intervention is unprecedented, it is still insufficient to avoid dangerous levels of climate change.

Global investment and positive trends in clean energy and other low emission technology are now likely unstoppable. International negotiations continue, slowly, towards a new legally binding treaty in 2015. Delicate but important progress is being made. The cost of climate impacts is becoming real and increasingly recognised as a danger to economic prosperity.

Despite political crosswinds, these fundamental trends continue and combine to ensure the future global economy will be carbon constrained. How smooth the transition will be and whether it can avoid extremely dangerous climate impacts is in serious doubt. There is no doubt, however, that carbon competitiveness matters now and will matter more in the 21st century.

Not all countries are equally prepared for this reality. Starting six years ago, The Climate Institute/GE Low-Carbon Competitiveness Index has measured the ability of G20 nations to provide prosperity for their citizens in a world that limits carbon emissions.

This year's Index updates data from 2008 to 2010* and shows that France, Japan, China, South Korea and the UK are the G20 countries best positioned to prosper in the low-carbon economy. France retains its top ranking due to its relatively low emission and energy efficient economy and growth in its high technology exports. Japan, South Korea and the UK all maintain similar scores and positions.

China has leapt up the Index to break into the five countries best positioned to prosper in a low emission world. China's dramatic improvement in low-carbon competitiveness results from significant increases in the country's clean energy investment and high technology exports. If China had merely maintained its clean energy investment at 2008 levels it would be in eighth place rather than third.

This is indicative of a broader trend: the momentum for climate action has shifted away from Europe and the United States towards the emerging economies of Asia.

China alone accounted for just under half of all new public equity (eg. shares in listed companies) raised in clean energy in 2010. The country now gains as much export revenue from solar panels (\$US36 billion in 2011) as it does from shoes.

Meanwhile, among the six countries whose low-carbon competitiveness decreased since 2008, the drop was greatest for the United States. While some of this was due to a decline in public equity investment in clean energy, other key factors were its declining high-tech exports and a major surge in its reliance on air freight.

* This Climate Institute/GE Low-Carbon Competitiveness Index updates last year's index which covered 1995 to 2008 by adding data to 2010. There is a time lag for all data for 19 indicators from all G20 nations to become public. See pp. 23-24.

► Women work on the construction of a large-scale solar farm in remote Gansu province, China. Trina Solar is set to build a 50MW solar farm in the Gansu province – that is five times the size of the largest project in Australia.

China now gains as much export revenue from solar panels (\$US36 billion in 2011) as it does from shoes.



Summary

(Continued)

Australia

Australia slightly improved its absolute score on the Low-Carbon Competitiveness Index, reversing its declining carbon competitiveness.

This fragile reversal has been driven by a number of factors along with relative good economic health:

- Increased investment in infrastructure and to a lesser extent education;
- A slight increase in efficiency within the transport sector; and
- An unusual decrease in the depletion of natural resources, which may be short lived.

Australia has not been well prepared to remain competitive in a world moving to emission limits. Our nation's highly polluting power sector, economic dependence on emission-intensive exports, inefficient use of energy and extraction of natural capital will become greater economic liabilities as the world moves to limit pollution.

The transition to a low-carbon global economy is underway. The competitiveness of carbon intensive economies depends on the degree to which they can adapt to these new parameters.

Key elements of the Clean Energy Future package and the Renewable Energy Target provide a platform for Australia to benefit from this transition. Carbon price signals improve the market competitiveness of cleaner and more efficient alternatives. Absolute limits on most of Australia's carbon pollution can be tightened in line with greater global effort.

Both major political parties have committed to cut emission by 5-25 per cent by 2020 from 2000 levels. Existing commitments from other major emitters indicate that our fair share of global efforts should already be above the unconditional 5 per cent target. An adequate contribution to a serious effort to avoid the 2°C warming target is at least a 25 per cent reduction by 2020. The ability of Australia to do our fair share and increase pollution targets across the full target range is a key test of strong and effective climate policy. It will also be a key test of whether we help build trust and ambition with other countries.

The next two years will vitally influence the international legal agreement expected in 2015. This agreement will contain commitments for all major economies for post-2020 emissions reductions. Australia's next government will be responsible not only for Australia's role and legacy in these critical negotiations, but for Australia's low-carbon competitiveness in the years and decades to come.

For this country to be a leading player in the low-carbon economy, we should build on our recent improvements. Our international diplomacy must foster the ambitious emission reductions Australia needs to avoid the worst impacts of catastrophic climate change. Our domestic policy framework must drive the carbon and energy productivity so that we can remain competitive in a world inevitably moving to reduce its economic dependence on pollution and to constrain carbon.

In a carbon-constrained world, prosperity will depend on generating maximum economic value for each tonne of carbon emitted.

Figure 1.0

France, Japan, China, South Korea and the UK top the 2013 Low-Carbon Competitive Index. The United States is ranked at number 11, and Australia is ranked 17th. (For the complete list of rankings, see the full table on pp 23-24)



As a country highly vulnerable to the impacts of climate change, the actions of other countries matter a great deal to us.

► Heavy industry in the industrial town Datong, China. The World Bank says that 16 of the 20 most polluted cities in the world are Chinese.



Global Trends

The global climate

As the *Global Climate Leadership Review 2012*¹ noted, several global megatrends will continue to influence Australia's response to climate change.

These include the growing reality of climate change and its impacts, booming investment in clean energy and the drive by many countries to reduce pollution on the basis of economic self-interest.

The *Global Climate Leadership Review 2013* reviews the state of these trends, the international cooperation on climate change and seeks to build on last year's work.

Importantly, the report summarises an update of The Climate Institute/GE Low-Carbon Competitiveness Index. The economic reality remains that countries operate within the physical limits of the atmosphere and they must deliver economic prosperity while at the same time reducing greenhouse gas emissions. The Low-Carbon Competitiveness Index measures G20 nations' preparedness for this reality.

The climate system will continue to confront us with the risks of our current economic dependence on pollution.

Two hundred years of fossil fuel use has taken carbon that was stored geologically and returned it to the atmosphere. Deforestation has released more pollution, while destroying natural stores and sinks of carbon. Together, these forces have overloaded the natural carbon cycle. Carbon dioxide levels in the atmosphere are now at their highest levels in at least 15 million years,² 40 per cent above pre-industrial levels.

Last year continued the trend of elevated global temperatures and is on track to be the ninth warmest year since records began in 1850.³

Arctic sea ice melted to reach unprecedented lows, falling in September to just above half its 1979–2000 average minimum. The global tipping point for the irreversible decline and loss of summer Arctic sea ice may have been crossed.⁴

Countries around the world were subjected to a year of unusually severe droughts, floods, heat waves and fires. The United States, for example, suffered extraordinary heatwaves in March and by September nearly two-thirds of the contiguous United States was considered to be in moderate to exceptional drought conditions. The drought is estimated to have impacted 164 million people and resulted in multi-billion dollar agricultural losses.

The Atlantic basin also experienced an above-average hurricane season, in terms of intensity of the storms, for a third consecutive year. Hurricane Sandy hit in the midst of the US Presidential campaign, claimed over 100 lives and significantly damaged infrastructure, roads, homes across the northeast US and the Caribbean.

Consistent with global trends, Australia continues to warm. Since the 1950s, each decade has been hotter than the one before, with average daily temperatures having risen by 0.9°C since 1910.⁵ January 2013 was Australia's hottest month on record, with mean temperatures for the continent running above 39°C for seven days straight for the first time on record.⁶

The climate system will continue to confront us with the risks of our current economic dependence on pollution.

Temperature records were broken at various locations around the country, and fire weather conditions reached catastrophic or code red levels in parts of New South Wales and elsewhere.⁷ At the same time, higher sea surface temperatures lifted more water vapour into the warmer atmosphere which can carry more water. This increases the risk of more intense and widespread torrential downpours, particularly in Australia's north.⁸

Asia strengthens its role as the centre of clean energy investment.

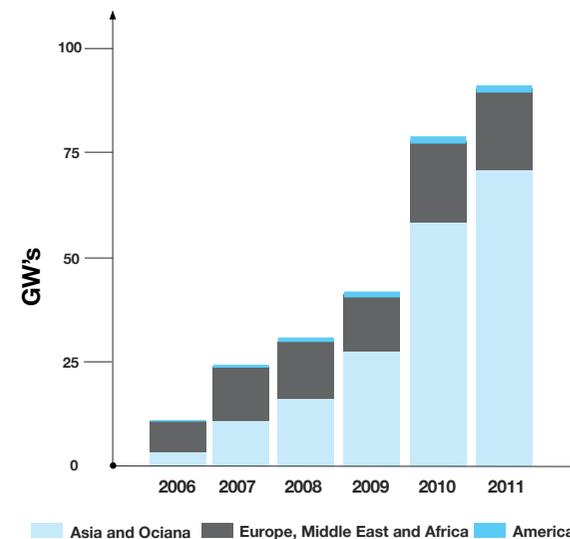
Asia is on track to replace Europe as the world's largest clean energy investment region, with more than one third of the world's clean energy investment⁹ in 2012. Around 90 per cent of global solar PV manufacturing is now in Asia; China now earns as much export dollars from solar products as it does from shoes.¹⁰ Around 60 per cent of global wind turbine manufacturing also takes place in Asia.

The US and Canada remain leaders in the development of carbon capture and storage, with a number of commercial-scale power sector projects under construction.¹¹ New projects are, however, increasingly being developed in China.

Global trade and competition in the clean energy industry have delivered benefits to consumers through fast technological advancement and lower costs (for example, solar PV systems have fallen in price by 75 per cent over the last two years). However, it has sparked an escalation in World Trade Organization disputes involving China, the US, EU, Japan and Canada over the subsidies given to support clean energy.¹² Subsidies to fossil fuels remain five to six times larger globally than subsidies for clean energy.¹³

Figure 2.0

Global solar PV and wind manufacturing capacity by region



Source: Bloomberg New Energy Finance

Global Trends

(Continued)

International negotiations move forward, national policies advance – and carbon markets falter.

Intergovernmental negotiations at the UN Climate Summit in Doha made delicate but important progress towards a 2015 single agreement with binding commitments from all major emitters.¹⁴ (See *The Doha Climate Summit – A Snapshot*, pp 39-42.) There were backward steps as Canada, Japan and Russia didn't move with Australia, EU and others in supporting a second Kyoto commitment period.

Each year until 2015 will have critical steps towards the 2015 agreement. The schedule for this year has developed countries establishing plans to scale up financing for adaptation and low-carbon development for poorer developing countries. The following two years will have increased focus on the ambition of current and post-2020 targets specifically and global action generally.

Outside the international negotiations, many new low pollution policies were announced throughout 2012, notably the development of carbon markets and pricing in the emerging economies of China and South Korea. (See *Policy Advances 2012* pp 17-20.)

Among developed countries, the introduction of Australia's carbon price was closely followed by the launch of emissions trading in California. Japan has brought in a small carbon tax (PPP \$2 per tonne) and a generous feed-in tariff for renewable generation. The US is introducing stringent emissions standards for vehicles and developing similar for industrial sources. Last year also saw many nations make progress on energy efficiency policy.

The EU's energy efficiency directive includes obligations on member states' energy companies to help customers save energy equivalent to 1.5 per cent of annual sales. India implemented an energy savings target and obligations ('Perform-Achieve-Trade') for energy intensive companies across nine industrial sectors. The US set efficiency standards for new light vehicles in 2017-2025 to be no more than 100g CO₂/km by 2025 (more than twice as ambitious as Australia's current voluntary standard). China's latest Five Year Plan builds on its previous success in reducing the energy intensity of the Chinese economy and includes mandatory energy standards of buildings, appliances, vehicles and industrial motors as well as energy targets for the nation's top 10,000 energy-using businesses.

Countries are implementing these policies for a range of self-interested reasons and out of concern for climate change. Reasons include air pollution, resource efficiency, energy security and independence as well as an eye to the economic opportunities in new clean technology industries.

The global carbon markets, worth around \$US80 billion last year, are characterised by excess supply. This has driven carbon prices in the EU and in international offset markets to unsustainably low levels. The average price of carbon in international markets in 2012 was around \$US7.4 per tonne¹⁵, falling from the 2011 average of \$US14.

As a result, the EU is undertaking a policy process to boost its carbon price. On balance, analysts are currently projecting the global carbon market and prices to grow over the next few years;¹⁶ projections suggest the value of the global carbon market to be around \$US120 billion by 2014.¹⁷

“...it is the countries that prioritise green energy that will secure the biggest share of jobs and growth in a global low-carbon sector set to be worth \$4 trillion by 2015.”

David Cameron, Prime Minister, United Kingdom, 2013

The direct carbon price is not the full story of carbon pricing, however. Countries are implementing a range of policies which also impose indirect carbon prices, for instance through taxation of the energy sector. The OECD recently estimated¹⁸ the weighted average of the implicit carbon price in all OECD countries at PPP \$35 per tonne. (See *Mythbuster*, p. 37.)

Overall, progress is significant but insufficient.

Despite phenomenal growth in global clean energy investment and the expansion of low pollution policies, the world is not on track to avoid dangerous levels of climate change. Under current policies and commitments the world is on a path towards 3-4°C of global warming this century.¹⁹

As the World Bank warned in late 2012: “*The projected impacts (of 4°C global warming) on water availability, ecosystems, agriculture and human health could lead to large-scale displacement of populations and have adverse consequences for human security and economic and trade systems.*”²⁰

To keep warming below 2°C, three key conditions need to be met:

- + reduced energy demand through significantly greater efficiency,
- + widespread deployment of carbon capture and storage technologies and renewable energy
- + and action to reduce emissions by all major emitters.²¹

These conditions will also become increasingly critical to economic success. For example, in February this year, the Prime Minister of the UK, David Cameron, launched an ambitious energy efficiency program with these words:

“...making our energy sources more sustainable, our energy consumption more efficient, and our economy more resilient to energy price shocks - those things are a vital part of the growth and wealth that we need.”

Policy Advances 2012

JANUARY



China's central government orders seven cities and provinces to impose limits on their emissions ahead of pilot emissions trading schemes (ETS).

FEBRUARY



South Africa announces it will levy a carbon tax from 2013, at a headline rate of PPP \$24 per tonne.

MARCH



China sets Guangdong province's carbon limit at 660 million tonnes in 2015. Draft rules for Beijing's ETS show it will cover electricity, manufacturing and major public buildings.

The **UK** sets a 2014–15 carbon price floor at PPP \$13.60 per tonne. This is designed to ensure electricity companies pay a minimum carbon price of around PPP \$25 per tonne.

Brazil's Rio de Janeiro state announces that it will start emissions trading in 2013, later deferred to 2014.

The **US** releases a draft carbon pollution standard for new fossil-fuel power stations that would require new coal plants to incorporate carbon capture and storage.

APRIL



Mexico legislates national emissions reduction targets (30 per cent below business as usual by 2020 and 50 per cent below 2000 by 2050) and a low carbon energy target of 35 per cent by 2024.

Chile sets a target to reduce energy consumption by 12 per cent through 2020.

MAY



South Korea passes legislation to launch an ETS in 2015.

China announces that all state-owned companies will have to start reporting carbon emissions ahead of a national ETS.

The **UK's** Energy Bill 2012 bans new conventional coal plants.

JUNE



Brazil's Sao Paulo state announces plans to launch an ETS.

China announces PPP \$6.3 billion in incentives for low energy vehicles and energy efficient appliances.

Japan introduces generous feed-in tariffs for renewable energy.

JULY



Australia's carbon price comes into effect.

New Zealand extends assistance measures to participants in its ETS and defers the inclusion of agriculture. It prepares to set an overall emissions limit.

The **European** Commission publishes proposals to boost carbon prices in the EU ETS. The EC also releases proposals to enable phase-in of tighter vehicle emission standards. New cars will be limited to 95g CO₂/km in 2020.

South Korea announces that its ETS will not accept international offset credits until after 2020.

Details released about **China's** Shanghai ETS reveal it will cover 16 sectors, including manufacturers and power producers.

India implements energy savings obligations ('Perform-Achieve-Trade') for companies across nine industrial sectors.

The Philippines approves subsidies for clean energy sources.

AUGUST



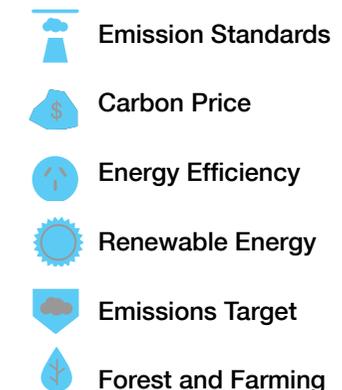
Australia and the **European** Commission announce that their emissions trading systems will be linked, with Australian companies able to access EU markets for compliance from 2015, and full bilateral trade from 2018.

The **US** sets efficiency standards for new light vehicles in 2017-2025 to be no more than 100g CO₂/km by 2025.

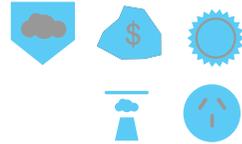
Indonesia offers subsidies for geothermal power.



For more information visit our Global Climate Action Map: globalclimateactionmap.climateinstitute.org.au



SEPTEMBER



Vietnam sets a goal to cut its carbon emissions per unit of GDP by 8-10 per cent by 2020.

Thailand announces a voluntary ETS from October 2014.

Hubei province in **China** announces that it will establish an ETS covering eight sectors from 2014. Emissions trading in Guangdong opens with a purchase of permits at PPP \$14 per tonne.

Japan announces a strategy to cut energy use by 19 per cent and generate 30 per cent of power from renewable energy by 2030.

Canada announces that tough limits on coal power station emissions will operate from 2015, effectively banning new conventional coal.

The **EU** Parliament passes a binding energy efficiency directive, which requires energy companies to help customers save power equivalent to 1.5 per cent of annual sales.

OCTOBER



Norway announces that it will nearly double its carbon tax on offshore oil and gas operations to roughly PPP \$42 per tonne. Extra revenue will go to a new climate and energy fund, rainforest protection and public transport.

South Korea strengthens its target to cut carbon pollution from its industrial and power sectors and accelerates its phase-out of HCFC emissions.

Serbia agrees to increase its use of energy from renewable sources by a third through 2020.

Brazil enacts a controversial law zoning forestland for protection, exploitation and reforestation. The law relaxes restrictions on deforestation but stipulates reforestation to offset clearing.

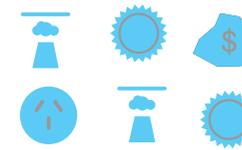
NOVEMBER



US: The first auctions occur under California's emission trading scheme, with units trading at \$US11 per tonne.

Qatar aims to build 1,800 megawatts of solar power by 2014. By 2020 the emirate is targeting 20 per cent electricity generation from renewables.

DECEMBER



At the Doha Climate Summit **Monaco** announces it will reduce emissions by 30 per cent below 1990 levels by 2020.

Lebanon pledges to achieve 12 per cent renewable energy by 2020 and the **Dominican Republic** commits to cut emissions by 25 per cent below 2010 levels by 2030.

Bahrain, Qatar, Saudi Arabia, and United Arab Emirates pledge to reduce carbon emissions as part of a strategy to diversify their economies.

India releases a draft policy to build 9,000 megawatts of solar by 2017, increasing its current supply eight-fold.

“In 2012 developing countries passed twice as many green laws as rich ones did.”

The Economist, January 19, 2013

Who is leading the low-carbon economy?

To stabilize concentrations of carbon dioxide and other greenhouse gases in the atmosphere, we must limit their further release.

The majority of nations accept that global warming of 2°C or greater risks dangerous and severe climate change impacts. To have a good chance - not a guarantee - of avoiding these impacts, the world must limit cumulative carbon dioxide emissions over the period between 2000 and 2050 to 1,000 billion tonnes.²²

This is substantially less than the currently available reserves of coal, oil and gas on company balance sheets. As the International Energy Agency (IEA) recently concluded, avoiding 2°C means that, in the absence of extensive use of carbon capture and storage technologies, *“more than two-thirds of the current fossil-fuel reserves could not be commercialised before 2050”*.²³

In a world where we succeed in limiting temperatures rises, the right to emit carbon will become a scarce and valuable resource – like minerals, fertile soil, water, financial capital and skilled workers. In this carbon-constrained world, prosperity will depend on generating maximum value for each tonne of carbon emitted.

Countries are already taking steps toward this future, although they differ in the rate at which they are making economic changes required to achieve these objectives. Countries also differ in the current exposure of their economy to carbon constraints and their potential to maximise future prosperity in a world turning to clean energy.

20

80

The IEA estimates that in the absence of carbon capture and storage, only a third of global fossil fuel reserves could be used to avoid a 2°C temperature increase. The UK-based Carbon Tracker Initiative has an even more conservative estimate. It says that some 80 per cent of reserves should remain untouched, if the world is to avoid dangerous climate change.

The Climate Institute/GE Low-Carbon Competitiveness Index

In 2009, The Climate Institute commissioned leading London-based analysts Vivid Economics to measure and rank the low-carbon competitiveness of G20 countries.²⁴

GE joined with The Climate Institute in 2012 in commissioning an update of the analysis, which included back casting the data to 1995 to examine how those rankings change over time.²⁵

The resulting Climate Institute/GE Low-Carbon Competitiveness Index has been updated this year using publicly available 2010 data.²⁶ The Index does not capture the impacts of more recent policy developments, such as Australia's Clean Energy Future package. Instead, it shows how previously implemented policies have influenced each country's absolute and relative readiness for a low-carbon world.

Framework for analysis

A total of 19 variables are included in the Low-Carbon Competitiveness Index. These were chosen for their robust statistical relationship to carbon productivity, and their weighting in the index is proportionate to the size of their impact. Some are included as proxies for broader measures. For example, the efficiency of oil refining is used as an indicator of broader energy efficiency in the industrial sector.

The indicators are assigned to one of three categories that were chosen to represent related but distinct elements of low-carbon competitiveness: sectoral composition, early preparation and future prosperity.

+ **Sectoral composition:** This category captures how the composition of the economy is currently structured towards less emissions intensive activities. Countries whose economies are more heavily weighted towards sectors which will experience lower demand due to climate action – e.g. the export of emission intensive products like coal or high levels of energy consumption in the transport sector - will be relatively worse off.

+ **Early preparation:** These indicators reflect the steps that countries have already taken to move towards a low-carbon economy. Early adopters of energy efficiency or low-carbon technologies will experience higher rates of learning, greater cost reductions and so will be better placed to generate material prosperity in the future. Also, the costs of shifting to a low-carbon economy will be higher if the transition is delayed and occurs more quickly or dramatically. For these reasons, countries which take early action on climate change will have higher standards of living in a low-carbon future.

+ **Future prosperity:** A country's ability to provide prosperity to its citizens in a low-carbon world is not just a function of technology and the sectoral composition of the economy. For example, beyond the general performance of the economy, prosperity will also be function of variables like investment in education which support innovation. Measures of natural capital will also be important to capture the change in a country's stocks of resources, such as agricultural land, minerals and forests. If countries deplete their stock of natural capital, their capacity to produce goods and services (such as timber or clean water) from the natural environment in the future is reduced.

Which countries are best placed to compete in a low-carbon economy?

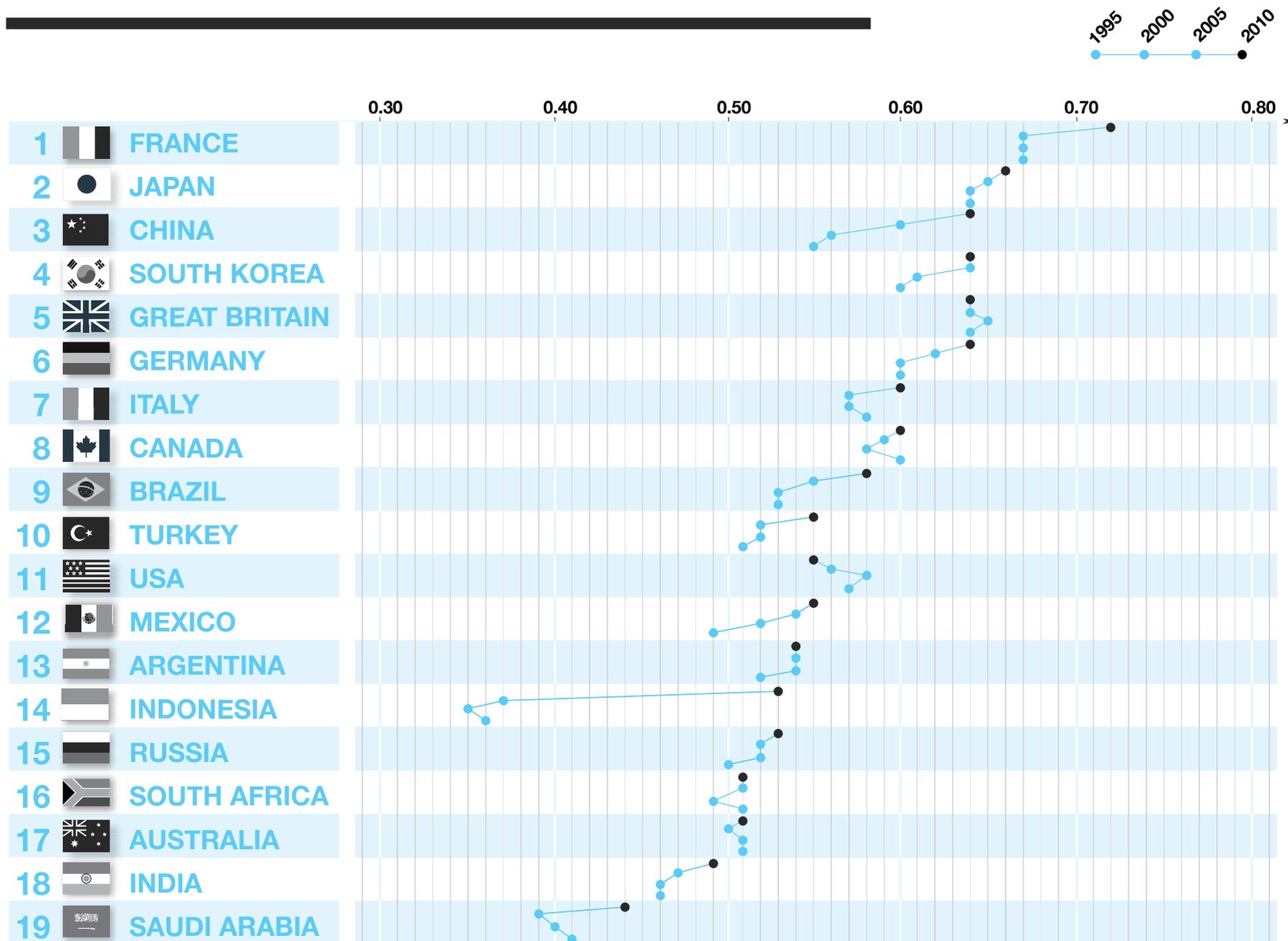


Figure 3.0

The Climate Institute/GE Low-Carbon Competitiveness Index measures the ability of G20 nations to provide prosperity for their citizens in a world that limits carbon emissions.

The Index was first developed by Vivid Economics in 2008. It comprises analysis of 19 variables that have been shown to have a statistical relationship to a country's carbon productivity, defined as the amount of carbon emissions produced by a given level of economic output.

IN PARTNERSHIP WITH



China has leapt into the top five best prepared nations for competitiveness in the low-carbon global economy.



► Workers standing outside the Goldwind wind turbine assembly plant in Gansu province, China. Goldwind is the largest manufacturer of wind turbines in China and the second largest globally.

Index Headlines

Overall, countries that come towards the top of the latest Climate Institute/GE Low-Carbon Competitiveness Index are those that have both high levels of economic activity per capita and have acknowledged the need to orient their economies towards low-carbon growth or manage resource constraints. By contrast, countries towards the bottom of the index are those whose economies are heavily dependent upon carbon intensive production for income and are delaying or slower to take action. This includes Australia.

+ **France, Japan, China, South Korea and the UK are currently best positioned to prosper in the low-carbon economy** (Figure 3.0 pp 23-24). France retains the top ranking it received in the previous assessment. Japan, South Korea and the UK have also maintained similar scores and positions.

A range of factors influence France's strong performance including a low emission, mostly nuclear, electricity sector, energy efficient passenger transport, high fuel prices and high technology exports (e.g. aerospace and pharmaceuticals). Although France, between 2008 and 2010, did not improve its absolute score by much, its growth in high technology exports and decrease in air freight more than made up for contractions in its capital formation and per capita income resulting from the global financial crisis.

+ **China has leapt into the top five best prepared nations.** China's dramatic rise up the Index to third place is the result not only of its major investment in clean energy, but also growth in its high technology exports.

+ **The United States has fallen behind.** One of six countries whose absolute score has worsened since 2008, the US has fallen behind by almost as much as China has leapt ahead, and is now in 11th place, down from ninth in 2008. This drop is due in large part to declining high-tech exports and a major surge in its reliance on air freight.

+ **Australia has slightly improved its score, but not its ranking.** Slight improvements across all three categories have not been enough to prevent Australia being overtaken by Indonesia and consequently falling from 16th to 17th place.

This fragile reversal has been driven by a number of factors along with relative good economic health:

- Increased investment in infrastructure and to a lesser extent education;
- A slight increase in efficiency within the transport sector; and
- An unusual decrease in the depletion of natural resources, which may be short lived.

Index Changes 2008-2010

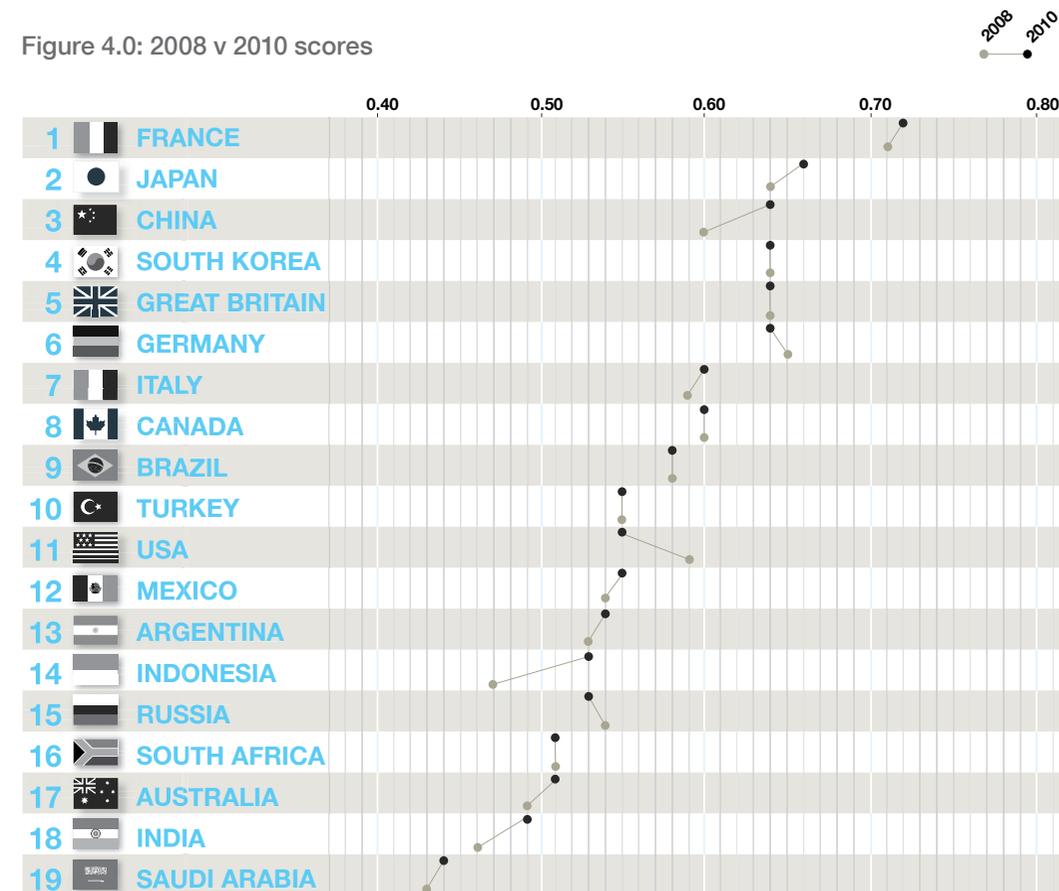
In the aftermath of the 2009 UN Copenhagen meeting, countries continue to implement policies that slow the growth in carbon emissions and encourage investment in clean energy.

Only three countries retained the same ranking between 2008 and 2010: France, Mexico and Saudi Arabia. Indonesia and China made great leaps, moving up four places. Germany dropped from second to sixth; Australia fell one rank to 17th.

Many of the smaller changes in ranking can be explained by the exceptional performance of Indonesia and China, while others reflect extremely close scores. So it is important to consider changes in absolute score, as well as rank.

This figure reveals, for example, a decrease in score for the United States that is almost as large as the increase in score for China. Whereas between 2005 and 2008 almost all countries improved their scores, performance between 2008 and 2010 has been much more mixed. Of the 19 countries considered, six have lower carbon competitiveness than in 2010.

Figure 4.0: 2008 v 2010 scores



Emerging Trends

+ **Trends in clean energy benefit Asian economies:** A widespread reallocation of investment in renewable energy outlined in the introduction has contributed to an increase in low-carbon competitiveness in Asian economies and a fall in low-carbon competitiveness elsewhere.

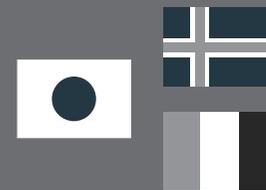
The contrast is particularly stark between China and the United States. The US previously accounted for a large share of the public equity investment in renewables: in 2008, 44 per cent of new public equity for clean energy investments was raised in the United States. As a result, the fall in public equity investment has had a larger effect on low-carbon competitiveness in the US than in any other non-Asian country.

On the back of proactive renewable energy policies, the investment has largely migrated to China, which accounted for just under half all new public equity raised in clean energy in 2010. This shift is an essential factor in the overall increase in China's low-carbon competitiveness. If investment in sustainable energy in China had remained at 2008 levels, the country's current overall ranking would be eighth rather than third.

+ **The financial crisis reduced the carbon competitiveness of Western economies:** The negative effect of the financial crisis has been more severe in developed countries and so the crisis has contributed to the catch-up of developing countries. For example, between 2008 and 2010, income per head declined in France, UK, Germany, the US and Italy. Meanwhile, emerging economies such as China, Brazil, India and Indonesia continued to grow. This bolstered their future prosperity and enabled developing countries to improve their performance in the Low-Carbon Competitiveness Index.

+ **High performing extractive economies reinvest resource income:** Some of the G20 economies are more dependent on generating income through the depletion of non-renewable resources than others. In 2010, nine countries in the G20 - including Australia - received more than four per cent of their national income from extracting non-renewable resources. Extractive economies have an opportunity to increase their future competitiveness by channelling income derived from non-renewable resources into investment in education and physical capital, including investment into renewables. This helps promote the sectoral shift necessary for extractive economies to reduce emissions and remain competitive in a low-carbon global economy.

Resource depletion can be offset by investing resource income into drivers of future economic growth. However, only a few extractive economies, such as Indonesia and China, have channelled their resource income into boosting physical capital formation and education.



Japan's focus on energy efficiency

As an energy importer Japan has a strong incentive to minimise its fuel bills. The country's ongoing focus on improving energy efficiency is an important factor in its high ranking on the Low-Carbon Competitiveness Index.

In 2008, the country introduced energy efficiency benchmarks for a range of sectors, particularly in energy-intensive industries. More than 1,100 industrial companies agreed to voluntary commitments. Meanwhile the Top Runner program, in operation since 1998, has driven continuous improvement in the efficiency of vehicles and equipment.

Top Runner standards are set to ensure the average efficiency of the rest of the market meets the performance level of most efficient products available (generally within three years). The standards have been revised and expanded, and now cover 21 types of products ranging from vehicles to electric rice cookers. So far, the program has seen energy efficiency improvements of between 16-80 per cent across the products covered.

Norway's reinvestment of oil income

Since discovering oil in the 1960s, Norway has taken a range of steps to ensure that the income from its resource extraction is used to benefit its citizens over the long term.

The proceeds of oil sales and taxes are directed into a sovereign wealth fund - one of the world's largest, worth some PPP \$381 billion, which invests exclusively overseas to counterbalance pressure on the Norwegian currency.

The annual returns from the fund allow the government to invest heavily in health and education: both are of a high standard and free to citizens. Norway participates in the EU's emission trading scheme, but has also had a carbon tax in operation since 1991.

Last year, the carbon tax on offshore oil and gas operations was roughly doubled to PPP \$42 per tonne.

This additional revenue will be used to promote renewable energy investment and emissions reduction domestically and globally with PPP \$307 million directed to reducing deforestation within developing countries in 2013.

France's policy mix

France's climate policy is linked to that of the EU. By 2020, the EU plans to achieve 20 per cent of its energy consumption from renewable energy, improve energy efficiency by 20 per cent and reduce emissions by 20-30 per cent on 1990 levels. The central policy to achieve these goals is its carbon limiting and pricing mechanism, the EU Emission Trading Scheme (EU ETS). The ETS was introduced in 2005 and sets a limit on carbon emissions from about 11,400 industrial facilities across the EU's 27 member states, Norway, Iceland and Liechtenstein. Croatia will join in 2013. France is one of countries whose industrial facilities must comply with the EU ETS.

France has also set domestic policies to reduce greenhouse emissions by 75 per cent by 2050. These include a mandatory energy efficiency scheme, renewable energy targets and incentives, efficient building regulations, tax breaks and loans for energy efficient buildings, financing and upgrading of public housing, tax credits for low emission cars, tax penalties for high emission cars and substantial investment in high speed rail networks.

What's happening in each category?

Sectoral composition

Recent shifts in sectoral composition scores can largely be attributed to two factors: air freight and high technology exports. Increased use of air freight, which is the most emissions intensive form of transport, decreases low-carbon competitiveness. Air freight has been rapidly increasing across most G20 countries. The change has been most dramatic in the US, where air freight grew by almost 30 per cent between 2008 and 2010, but is also evident in China and South Korea. France and Brazil were the only countries to show decreased air freight across this period.

Conversely, increasing high-tech exports improves low-carbon competitiveness, as these products tend to be low in emissions intensity but high in value. High-tech exports, which include aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery have been increasing in France, the UK, Germany, Russia and China. To the extent that sectoral composition has improved in these countries, it is largely attributable to this change. The expansion of high-tech exports in these countries seems to be largely at the expense of the US, where high technology exports account for less than 20 per cent of all manufactured exports in 2010, compared with 27 per cent in 2008.

Variable	Definition	Is Higher Better?
Transport sector energy consumption per capita	'000 tonnes of oil equivalent (toe) per capita	NO
Deforestation rate	Percentage of total forest cover	NO
Share of high technology exports	Percentage of total exports	YES
Size of road transport sector	Cars per 1000 people	NO
Balance of emissions embodied in trade	Percentage of total emissions from production	NO
Air freight	Million tonne-kilometres	NO
Clean energy production	Percentage of total energy use	YES

Early preparation

Recent changes in early preparation have been largely driven by changes in clean energy investment and rising fuel prices. Investment in clean energy is increasingly shifting away from Western economies toward Asia. Higher fuel prices produce a "double dividend" for low-carbon competitiveness. They encourage greater fuel efficiency throughout the economy. In addition, where prices are relatively higher due to energy taxes, this revenue reduces reliance on other forms of taxation. In many countries a portion of tax revenue may be invested in energy efficiency, public transport and renewable energy, further improving low-carbon competitiveness.²⁷

Variable	Definition	Is Higher Better?
Efficiency of oil refining	Net energy input into oil refineries per unit of output ('000 toe)	NO
New sustainable energy investment	\$US equivalent listed on the local stock exchange	YES
Electricity distribution losses	Percentage of total electricity generated	NO
Annual growth in greenhouse gas emissions	Change in emissions (%)	NO
Price of diesel fuel	\$US/litre	YES
Carbon intensity of electricity	CO ² per kWh	NO

Future prosperity

Since 2008, future prosperity scores for countries in Europe and North America declined due to global economic conditions. Much of the increase in future prosperity within developing countries is the result of a decrease in the cost of starting a business. This is especially true for Indonesia. Physical capital formation also decreased across European and North American countries, such as the US, Canada, France, Germany and the UK. The same countries simultaneously experienced contractions of average income. Both effects led to falls in future prosperity.

Variable	Definition	Is Higher Better?
Human capital	Education expenditure as % of GNI	YES
Physical capital	Rate of fixed capital formation as % of GNI	YES
Natural capital	Depreciation as % of GNI	NO
Population growth	Percentage change	NO
GDP per capita	2000 \$US per person	YES
Cost of business start-up procedures	Percentage of GNI per capita	NO

References for individual variables can be found in the associated Vivid Economics report on The Climate Institute's website.

Countries that did well in the index rankings are those that have recognised the inextricable link between economic and resource security and climate change policies and are acting accordingly.

► A solar farm under construction in the remote Gansu Province, China. The government is working towards a plan to supply 15 per cent of the country's energy from alternative and renewable sources by 2020.



How is Australia doing?

Australia's low-carbon competitiveness has improved slightly since 2008.

Australia's performance has slightly improved in all three Index categories, but progress is fragile. This data, however, does not include the impact of the Clean Energy Future laws that took effect in 2012. These have the potential to significantly improve the nation's low-carbon competitiveness as carbon pricing promotes low-carbon investment and discourages allocation of resources to high-carbon technologies and activities. With the Clean Energy Future package carbon productivity broadly keeps pace with global trends.²⁸

The fragile reversal of Australia's ranking has been driven by a number of factors along with relative good economic health:

- Increased investment in infrastructure and to a lesser extent education;
- A slight increase in efficiency within the transport sector; and
- An unusual decrease in the depletion of natural resources, which may be short lived.

Improvement is driven by an increase in high technology exports and an unusual increase in the energy efficiency of the transport sector,²⁹ in part this is likely to be driven by higher fuel prices shifting consumer preferences towards more efficient modes of transport. Lower population growth, more investment and decreased depletion of natural resources all contributed to an improved score. In addition, the cost of starting a business remains the third lowest among the G20 and GDP per capita continued to increase between 2008 and 2010.

Australia's public equity investment in clean energy in 2010 totalled \$US250 million. Compared with other countries this was a relatively small amount: less than one-tenth of public equity raised in the United States, though higher than South Korea, Brazil and France.

While not captured in the current index, Australia's overall clean energy investment did increase significantly in 2011, on the back of a large uptake in solar PV by households.³⁰

It fell again in 2012 as wind investors held back, awaiting the outcomes of the Renewable Energy Target review. The first three quarters of 2012 saw an 18 per cent drop in total clean energy investment compared to the same time in 2011. Assuming the Renewable Energy Target remains unchanged, investment is expected to grow again in through 2013-15.

Two trends deserve special attention. Natural resource depletion declined between 2008 and 2010. This is a recent development; between 1995 and 2008 the share of national income from resource extraction increased significantly. This shows that - notwithstanding the mining boom of recent years - profits within the extractive sector did not keep pace with overall economic growth. This could indicate an improvement in the sustainability of resource use, as it reflects reduced reliance on non-renewable and emission intensive resource.

However, while comparable data is not yet available for 2011 there is some evidence that the economic cost of extraction is increasing again. For instance, the share of resource and energy exports decreased between 2008-9 and 2009-10, but grew between 2009-10 and 2010-11.³¹

Simultaneously, Australian investment in physical capital such as equipment and infrastructure has been rapidly increasing. In 1995, net physical capital investment was just over one per cent of national income. By 2010, it had increased to over ten per cent. Investment remains low by the standards of other extractive economies.

Lower relative natural capital extraction, higher physical capital investment and higher human capital investment (such as education), all increase Australia's potential for future prosperity, yet there is room for further progress. Australia's investment in human capital is not high by international standards. At 4.5 per cent of gross national income in 2010, it is lower than France, Germany and the United States.

▶ A child's bicycle is the only recognisable item left in what was once a family home in Tasmania. Over 25,000 hectares were burnt in the Forcett region alone, during one of more than 40 fires that were ignited in Tasmania during the January 2013 heat wave.



Mythbuster

Australia is not alone on pricing carbon. OECD research published in January 2013 found that 29 of its member countries have higher 'effective' carbon prices than Australia. In fact carbon pollution – whether through a tax, market mechanism, or other policy – is priced in every OECD country.

Average effective CO₂ prices on energy in OECD countries

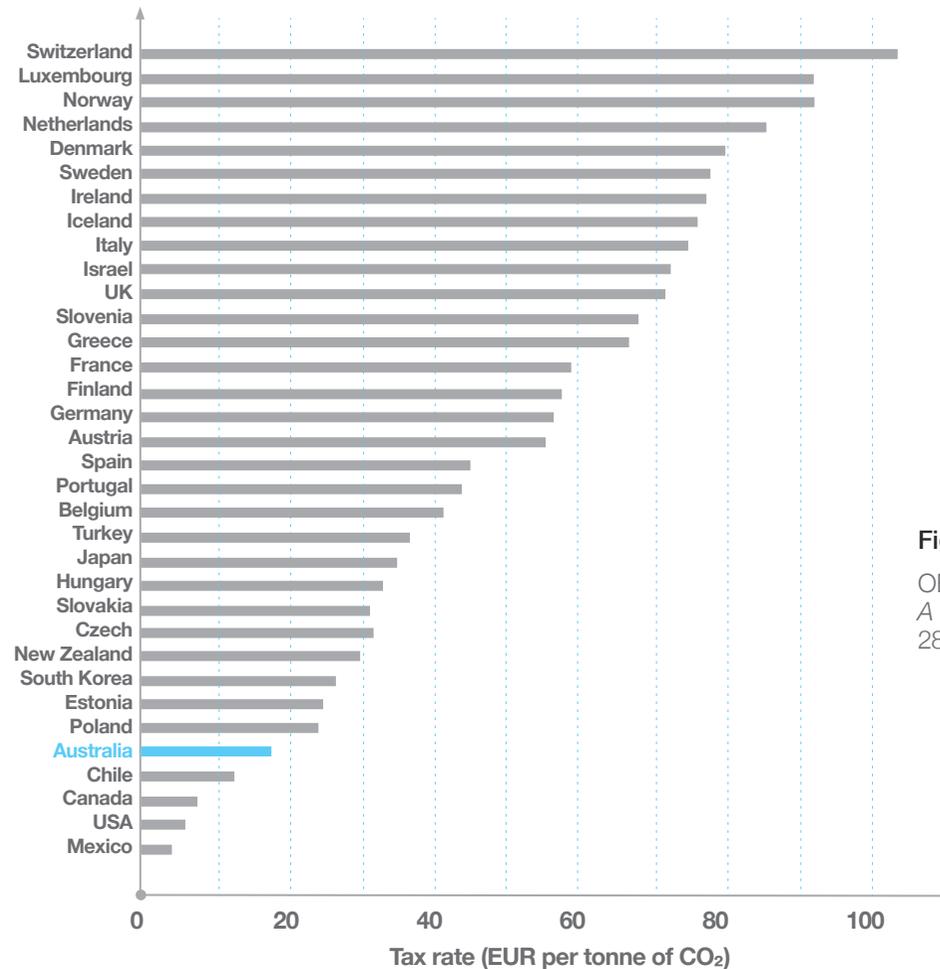


Figure 5.0
 OECD, *Taxing Energy Use: A Graphical Analysis*,
 28 January, 2013

Australia's effective carbon price on energy comes in near the bottom of the list of 34 OECD countries.

- + The weighted average of all OECD countries is EUR 27 (PPP \$34) per tonne.
- + Within OECD countries, effective taxes on CO₂ from energy, range from EUR 107 per tonne (PPP \$134) in Switzerland to EUR 2.80 (PPP \$3.50) in Mexico.



The Doha Climate Summit

A Snapshot

Global climate cooperation: The Doha Climate Summit

The action that countries take to reduce emissions and drive low-carbon competitiveness does not occur in isolation of co-operation between other nations.

The central forum for international climate change remains under the UN Framework Convention on Climate Change. Other small groups of countries also form agreements to reduce emissions and drive technology cooperation but to date these “clubs” have yet to deliver material results.³²

Domestic action and international agreements are mutually reinforcing. Successful domestic action can build countries’ confidence that any future international commitments can be achieved, while international agreements can build confidence that potential trade competitors will also take domestic action – in turn supporting greater domestic ambition. Rules-based frameworks can also promote economic efficiency by avoiding the proliferation of different policy frameworks that operate under different settings and by promoting transparency around the impact of a countries policy. The last point is important in building trust between nations.

International agreements also set parameters for domestic policy, such as rules for carbon trading. The Kyoto Protocol’s carbon trading schemes have unlocked billions of dollars of investment in low pollution technology, including over \$US180 billion in developing nations.³³

The absence of internationally binding commitments is not stopping countries pursuing climate and clean energy action for these and a range of other reasons including avoiding the health costs of pollution and energy security. Whatever their motivation, these actions are building the confidence of countries in low carbon prosperity while they continue to make practical progress on detailed international agreement design.

Doha outcomes

The UN Doha Climate Summit in 2012 was an opportunity to finalise the negotiation of the 2007 Bali Action Plan and begin its full implementation.

It was also an opportunity to finalise amendments to the Kyoto Protocol that would see the beginning of new binding commitments for some developed countries.

In achieving these outcomes Doha can now help governments focus on finalising the post-2020 binding agreement in 2015.

Before Doha, The Climate Institute suggested three possible scenarios for the meeting: focus, business as usual, and collapse.³⁴ While many of the specific elements of the agreement were modest, the Doha UN Climate Summit did conclude with an agreement to streamline negotiations towards a new legally binding agreement by 2015 (see next page).

However, it is clear that, for an ambitious outcome in 2015 to be delivered, the ambition and spirit of co-operation that countries bring to these meetings, needs a reset.

Domestic action and international agreements are mutually reinforcing.

This is not a reflection on the clichéd commentary about climate talks being a fight between the developed and the developing world. These two blocks do line up against each other on occasion, but Doha continued the trend, started in Copenhagen, towards developing nations advocating positions separate from the greater G77+China bloc.

Doha, for example, saw the emergence of the Independent Alliance of Latin America and the Caribbean. This informal group, which includes Colombia, Chile, Costa Rica, Peru and Guatemala, was formed around the view that countries need to act according to their capabilities and stop looking to others to act first. At the other end of the scale you have the Like Minded Group, which takes the old hard-line G77+China position.

The success of the important Durban outcome in 2011 was facilitated by the progressive countries of the EU working with the world’s vulnerable small island developing states to pressure large emerging economies to support an ambitious agreement. The inability of such an alliance to form in Doha is one of the reasons the meeting was so difficult. In part this is because developed nations have not been delivering ambitious emission reductions and financing commitments. On the other side, some of the more vulnerable nations slipped back into uncompromising positions that gave the EU little room to move.

As we head towards 2015, greater signs of ambition will be needed to build co-operation and allow progressive groups of countries across the developed and developing world to build energy into the process.

The years 2013 and 2014 will focus international scrutiny on Australia's commitment to build global ambition. In Doha, countries agreed:

+ Australia and other developed countries should demonstrate how they will scale up investments to deliver the agreed US\$100 billion in public and private sector finance by 2020.

+ In 2014, Kyoto countries must revisit their national targets and communicate to other governments their intention, or not, to increase ambition. This will occur in parallel with international review of the adequacy of actions to meet the goal of avoiding 2°C. This will include key inputs from groups like the Intergovernmental Panel on Climate Change which releases its Fifth Assessment of the science, impacts and economics of climate change over the 2013-14 period.

The Doha Climate Summit

(Continued)

Doha outcomes: Assessment by The Climate Institute

+ positive outcome / neutral outcome - negative outcome

Number of symbols indicates strength of statement. Three marks indicates very strong, two marks indicates moderate and one mark indicates modest. Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI) are the two standing technical/implementation bodies of the Convention.

Durban platform: new legally binding agreement by 2015 and increased pre-2020 ambition

+ New legal agreement: Roundtable discussions in 2013 focused on how the principles of the Convention (for example equity) will apply in a new agreement, lessons learned from other multilateral agreements, and the scope, structure and design of the new agreement including how to reflect country actions. A draft text for the new legal agreement to be produced by early 2015.

/ Process for increased ambition: Technical process to examine options to increase ambition including through removing barriers to greater emission reductions and identifying ways to incentivise action. The Secretary-General of the UN will convene a meeting of world leaders on climate change in 2014.

Kyoto Protocol

+ + Amendments on new targets 2013-2020 agreed

+ + Ambition mechanism: Mechanism that allows governments to increase but not decrease targets. Countries must revisit their national targets and communicate to other governments their intention or not to increase ambition in 2014. These undertakings will be subject to review at a Ministerial meeting the in same year.

/ Kyoto markets: Access to primary Kyoto project-based carbon trading (e.g the Clean Development Mechanism) is not available to countries to meet UN commitments unless they have a second Kyoto target. Levy on carbon trading to continue to support the Adaptation Fund.

/ Assigned Amount Units (AAUs): Carryover of AAUs limited. Countries can only use as much as they need to meet new 2013-2020 targets. Trading of AAU limited to 2 per cent of the Kyoto target. Political declaration that EU, Japan, Norway, Switzerland, Australia and of other Kyoto parties will not buy AAUs surplus from the first commitment period.

Negotiations launched in Bali under the UNFCCC

+ Negotiations terminated and agreements moved to implementation

/ Transparency around commitments for non-Kyoto major emitters: Continue process in SBSTA to define a common basis to measuring progress towards targets and ensure efforts are comparable between developed countries. Common reporting framework agreed for developed countries including the reporting of non-UN market mechanisms. Under the SBI, clarification of developing country actions continues to examine assumptions behind commitments and their financing needs.

+ Review: Process launched in 2013 to review adequacy of 2°C global goal. Review to be concluded by 2015. Will also examine the adequacy of actions to meet goal and includes reference to a new 1.5°C goal. Joint SBSTA/SBI process initiated with key inputs from groups like the Intergovernmental Panel on Climate Change.

/ Finance: Reaffirmation of goal to provide \$US100 billion public and private sector finance by 2020, calls on developed countries to scale up climate finance to 2020 goal, developed countries to submit pathways to scale up finance by COP19 by the end of 2013. At the same meeting there will be ministerial consideration of pathways to scale up finance. Over \$US7.5 billion committed to finance by EU countries over the next couple of years.

+ New markets mechanism: SBSTA will undertake a work program on new market mechanisms to develop a draft decision for adoption in 2013. Includes questions around the oversight of UNFCCC, standards, MRV requirements and sectoral/economy wide measures.

/ Reducing emissions from deforestation and degradation: Work program to scale finance for emission reductions under SBSTA and SBI.

/ Adaptation: Weak ongoing work plan with the suggestion of annual forum to keep political focus on adaption needs. Agreement to examine the institutional arrangements around the potential to compensate developing countries who suffer severe climate change impacts.

Bringing it Home

Three key conclusions can be drawn from the analysis provided in the *Global Climate Leadership Review 2013*:

1. Policy implementation to reduce emissions and drive low pollution investment around the world continues. Many countries recognise that reducing their dependence on high emission industries is in their economic self-interest.
2. The engine room of clean energy investment and carbon policies is shifting to Asia, particularly China.
3. Australia's sliding carbon competitiveness had a fragile reversal between 2008 and 2010 but the next few years will be critical to sustaining this trend and our historical legacy in crucial global climate negotiations due to conclude in 2015.

Despite the substantial action of many nations, the world is currently on a path that would see climate change exceed the adaptive capacity of many economic and natural systems and put at risk hundreds of millions of people. While self-interest will help, global co-operation will be vital for the switch to a zero carbon global economy in the next few decades.

Assertive, credible climate diplomacy and engagement will be necessary in many international forums, including the UN. The next three years will be critical to sustain and boost delicate but important progress at the UN climate negotiations. Far greater ambition is required by all major emitters to avoid irreversible and severe impacts from an increasing hostile climate.

As a nation Australia is the advanced economy most vulnerable to the impacts of climate change.³⁵ How the world addresses climate change matters to us. Failure to implement effective and decisive action would have a disproportionate impact on our lives, our economy and our natural systems.

Building national low-carbon productivity

Australia is also currently not well prepared to remain competitive in a world moving to constrain carbon emissions and encourage clean energy. In the past, the nation has moved only incrementally. As the Low-Carbon Competitive Index and other analysis demonstrates³⁶, our nation's high emissions power sector, economic dependence on emission-intensive exports, inefficient use of energy and extraction of natural capital are economic liabilities as the world moves to limit pollution.

The Clean Energy Future package is a break from decades of delay and inaction and provides a platform for ongoing economic growth. While the package has its weaknesses, for the first time from 2015, most of Australia's economy will face an absolute limit on the amount of pollution they can emit into the air. Global carbon market price signals will also make it more expensive to produce pollution while at the same time making it easier for low pollution technologies to compete against high emission alternatives. There are signs that the package is already having an impact on emissions in the power sector.³⁷

Policy readiness for greater ambition and co-operation

In 2012, both major parties supported Australia making a legally binding international commitment to reduce national emissions over the period from 2013-2020. With Coalition support Australia included its full bipartisan-supported target range of 5 per cent to 25 per cent reductions on 2000 levels by 2020 into the Kyoto Protocol. From 2013 to 2015, whoever wins government will be under intense domestic and international scrutiny on performance against these commitments.

From Doha, the next two years will define the contours of the new legal agreement to be agreed in 2015. This agreement will set the nature of post 2020 emission reduction commitments for all major economies. Any new commitment post 2020 for Australia will be stronger than the current 5-25 per cent 2020 targets. This underscores the need to ensure the nation can deliver much deeper reductions than currently pledged in a little over a decade. Policies that just end in 2020, end at the beginning.

Internationally, Australia will need to show its hand in 2013 on how it will scale up international finance to meet its commitment to provide its fair share. Financing the world's poorest nations to help them build resilience to an increasingly hostile climate and help them on a path to low-carbon development is part of the glue that holds international co-operation on climate change together. Beyond its political significance, financing is also in our national interest as we live in a region very vulnerable to climate change. Building resilience to climate change in the region helps avoid deploying military and emergency services in humanitarian or other operations to cope with the impacts of climate change on existing and displaced populations of millions of people.

Australian leadership in 2013

Addressing climate change in Australia and globally, is a marathon not a sprint. Stable and long-term policy settings are needed to deliver investment and growth in the industries central to Australia's long-term prosperity.

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