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Measuring Low Carbon Competitiveness

"The global economic recovery presents an ideal opportunity for countries to shift towards low carbon growth. Countries which don't seize this opportunity will undermine their future competitiveness and prosperity."

Lord Nicholas Stern, in preface to the ***G20 Low Carbon Competitiveness*** *report*

The importance of low carbon competitiveness

How nations adapt to a carbon constrained world will redefine their ability to compete in the global economy and deliver lasting prosperity for their citizens. Traditional measurements of competitiveness fail to assess the extent to which nations are ready to move to a low carbon future. The ***G20 Low Carbon Competitiveness*** report by Vivid Economics provides a fresh perspective. Commissioned by E3G and the Climate Institute (Australia), the report offers the first comparative, data-driven analysis of the low carbon competitiveness of major economies accounting for around 75% of world GDP and nearly 70% of global greenhouse gas emissions. [1]

Key findings:

- European countries (France, UK and Germany) are front-runners today in the transition to a low carbon world, thanks in part to structural economic changes in the 1990s, but some emerging economies are catching up fast.
- The US has the potential to be a big winner from the clean energy revolution but is held back by relatively carbon-intensive infrastructure and high use of energy in the transport sector.
- Japan is also relatively well-placed today, but its leadership is under threat. Since 1990 Japan's improvement in carbon productivity has been one of the lowest of all G20 countries, just ahead of Brazil and Saudi Arabia.
- South Korea is positioning itself to become a front-runner and other emerging economies (South Africa, Mexico) are leading the way in improving their carbon productivity.
- Most countries are failing to deliver the improvements in carbon productivity required to provide a fighting chance of limiting global warming below 2°C. Mexico

[1] The G20 includes Argentina, Australia, Brazil, Canada, China, European Union, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, and United States of America. The *G20 Low Carbon Competitiveness* report covers the 19 country members but not the EU as a whole.

and Argentina, followed by China, South Africa and Germany, are making the best progress on this score.[2]

Accelerating the transition to a low carbon future

There is a growing global consensus on the necessity and inevitability of a low carbon world. At the London Summit in April 2009, G20 leaders pledged to "make the transition towards clean, innovative, resource efficient, low carbon technologies and infrastructure" and to reach agreement at the UN Climate Change Conference in Copenhagen in December 2009.[3] The declaration of the leaders of the Major Economies Forum on Energy and Climate in July 2009 recognised "the scientific view that the rise in global average temperature above pre-industrial levels ought not to exceed 2 degrees Celsius".[4] Achieving this goal will require ambitious policy reform in all the major economies to drive growth and job creation in the low carbon industries of the future.

The need for a "paradigm shift" in defining competitiveness

Concepts of "competitiveness" have long been central to national debates on climate change. Opponents of climate action have traditionally argued that tackling climate change will undermine national competitiveness and should not be undertaken ahead of other countries. High polluting industries have lobbied successfully on this basis for government subsidies and protection from economic policies intended to improve carbon productivity.

It is now increasingly recognised that this narrow view of competitiveness is inadequate. For example, South Korean President Lee Myung-Bak has called for a "paradigm shift" towards low carbon growth. In 2008 alone, US$155 billion was invested in new clean energy sources, representing a four-fold increase since 2004 and for the first time outstripping investments in the fossil fuel technologies.[5] Worldwide,

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[2] The analysis assumes more ambitious action by developed (Annex I) countries, consistent with the principle of "common but differentiated responsibilities and capabilities" embodied in the UN Framework Convention on Climate Change (UNFCCC).

[3] See official communiqué at http://www.g20.org/Documents/final-communique.pdf

[4] The 17 major economies participating in the Major Economies Forum are: Australia, Brazil, Canada, China, the European Union, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, South Africa, the United Kingdom, and the United States. The Declaration is available at http://www.whitehouse.gov/the_press_office/Declaration-of-the-Leaders-the-Major-Economies-Forum-on-Energy-and-Climate/

[5] UNEP, SEFI and New Energy Finance (2009), Global Trends in Sustainable Energy Investment 2009: Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency.

the renewable energy sector already employs an estimated 2.3 million people – more than the total number employed directly by the oil and gas industry.[6] Countries that fail to adapt to this reality risk locking in obsolete technology and missing out on the opportunities of a low carbon world.

Toward a broader definition of competitiveness

The report assesses both the current low carbon competitiveness of the major economies and the extent to which they are improving their carbon productivity. It defines low carbon competitiveness as the ability of a country to generate economic prosperity while simultaneously reducing greenhouse gas emissions.

There are three elements to assessing overall low carbon competitiveness: where countries are positioned now, the rate at which this is changing, and the scale of the challenge countries face. The *G20 Low Carbon Competitiveness Report* therefore compares the performance of countries along three key metrics:

1. The *low carbon competitiveness index*, measuring current capacity of countries to generate prosperity in a low carbon economy.

2. The *low carbon improvement index*, measuring the extent to which countries are improving their carbon productivity over time – i.e. their ability to grow their economies while reducing emissions.

3. The *low-carbon gap index*, measuring whether countries are increasing their carbon productivity quickly enough to ensure global emissions peak by 2020, as is required to keep open the possibility of staying below the 2°C threshold.[7]

Figure 1 below (low-carbon competitiveness index) shows that **France, Japan, the UK, South Korea and Germany** are best placed, today, to deliver prosperity for their citizens in a low carbon world. This reflects their relatively high levels of GDP per capita and the adjustments they have already made to their economies to allow for low carbon growth. However, because this is a static assessment, it does not tell the full story. The rate at which countries are improving their carbon competitiveness is potentially more important than their current position.

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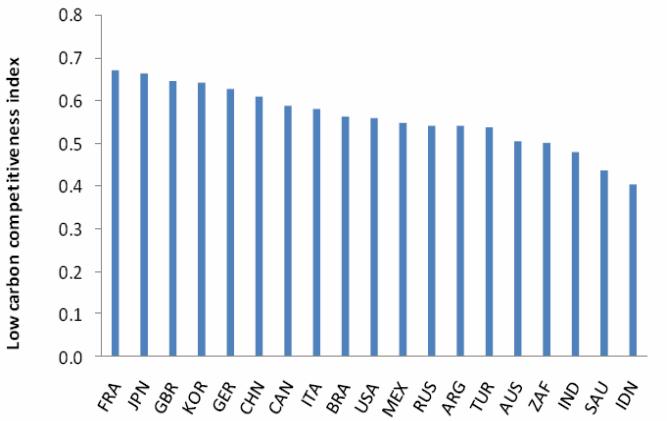
[6] Ban Ki-moon, "Green growth is essential to any stimulus", Financial Times, 17 February 2009.

[7] The global and differentiated targets in this scenario are based on Table 13.7 in the Intergovernmental Panel on Climate Change report on climate change mitigation and subsequent studies. For the 450 ppm-e scenario this highlights a 25 to 40 percent reduction below 1990 for developed countries by 2020. Global emissions need to peak at around 15 to 30 % above 1990 levels by 2020 and industrialising countries emissions are around 100 % higher than 1990 levels by 2020.

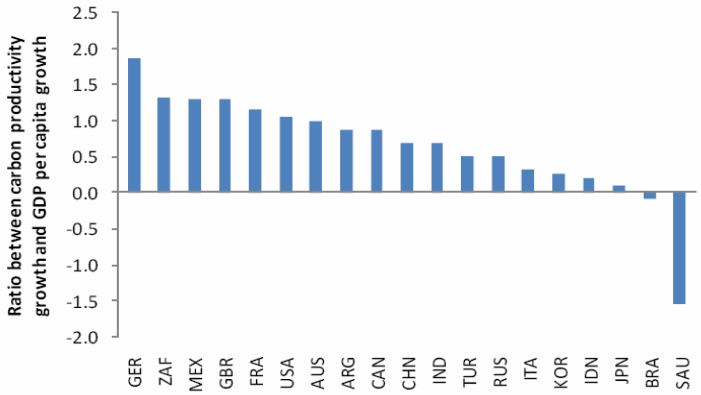
Figure 1



Source: Vivid Economics calculations

Figure 2 below (low carbon improvement index) shows that **Germany, South Africa, Mexico, the UK and France** have achieved the greatest progress during the period 1990-2005 in improving their carbon productivity. Some of this can be explained by structural economic changes that were not primarily driven by climate policy (e.g. industrial reform following German reunification and the "dash to gas" in the UK). Countries with the slowest rate of improvement include both developed economies such as **Japan** and emerging economies such as **Saudi Arabia**.

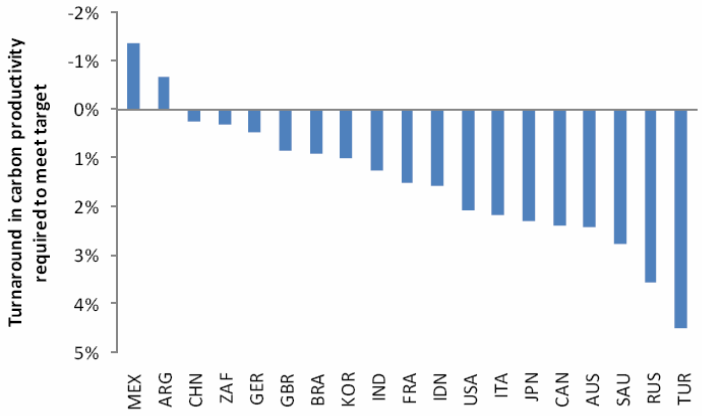
Figure 2



Source: Vivid Economics analysis of World Bank data

Figure 3 below (low carbon gap index) suggests that most countries are off track in improving carbon productivity at rates consistent with staying below the 2°C threshold. Only **Mexico** and **Argentina** are currently delivering the necessary rate of improvement, although China, South Africa and Germany are also close to being on track. The gap index assumes more ambitious action by developed (Annex I) countries, consistent with the principle of "common but differentiated responsibilities and capabilities" agreed in the UN Framework Convention on Climate Change (UNFCCC).

Figure 3



Source: Vivid Economics Analysis of World Bank data

Key policy implications

Governments can gain first mover advantage from investing in the low carbon industries of tomorrow. Some G20 countries are already moving in the right direction for example through "green new deal" stimulus packages and climate change strategies – South Korea being the best example. Such measures need to be fully integrated into wider, long-term macroeconomic policies and combined with robust mechanisms to monitor progress. The UK has established an independent Climate Change Committee and has published a detailed low carbon growth strategy.

Excessive shielding of high polluting industries risks locking in lower levels of carbon productivity. Some assistance to trade exposed industries to prevent carbon leakage may be necessary. However, assistance must take into consideration the costs for the rest of the economy (shielding one sector simply pushes the burden and cost onto the rest of the economy) and must be designed to ensure

companies still have a strong incentive to improve carbon productivity. Fossil fuel subsidies should be phased out as quickly as possible.

Copenhagen must provide a foundation for all countries to be more ambitious and accelerate the transition to a low carbon economy. Staying below 2°C requires a step change in overall carbon productivity such that global emissions peak well before 2020. Current efforts fall well short of what is needed. To get back on track we need a comprehensive outcome at the UN Climate Change Conference in December including ambitious targets for developed countries, strong commitments to action from industrialising countries, a finance package to support mitigation and adaptation in the developing world, and a robust and binding legal architecture to ensure trust building and transparency.

Coordinated international action by the major economies can add value to national efforts. The G20 Summit in London in April 2009 set a positive precedent when G20 leaders recognised the critical need to act together to stem the financial crisis and stimulate the economy.[8] We now need the same concerted international action to accelerate the shift of capital toward clean, efficient infrastructure. Plans to unlock public and private sector financing for low carbon solutions are on the agenda at the September G20 Summit in Pittsburgh (24-25 September). A strong mandate for action from Heads of Government would help build momentum towards a successful outcome at Copenhagen.

Governments need to avoid returning to business-as-usual growth formulas as the global economy recovers. To ensure a sustainable recovery, governments must embrace new engines of growth that enable, rather than hinder, the transition to a low carbon future. Smart investments in clean, efficient technologies will not only benefit the economy but can also reduce the risk that the green shoots of recovery are choked off by a rapid rise in oil prices. Analysis shows that while some G20 countries have prioritised low carbon investments in their fiscal stimulus packages, most countries could afford to be much more ambitious.[9]

The report ***G20 Low Carbon Competitiveness*** can be downloaded at:
www.e3g.org.

[8] See official communiqué at http://www.g20.org/Documents/final-communique.pdf

[9] http://www.e3g.org/index.php/programmes/climate-articles/delivering-a-sustainable-low-carbon-recovery/

About E3G

Third Generation Environmentalism Ltd (E3G) is an independent, non-profit European organisation operating in the public interest to accelerate the global transition to sustainable development. More information is available at www.e3g.org.

About The Climate Institute

Established in late 2005, The Climate Institute is a non-partisan, independent research organisation that works with community, business and government to drive innovative and effective climate change solutions. More information can be found at www.climateinstitute.org.au.

About Vivid Economics

Vivid Economics is a London based economics analysis group that uses economic tools to generate lasting benefit for business and society. More information can be found at www.vivideconomics.com.

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