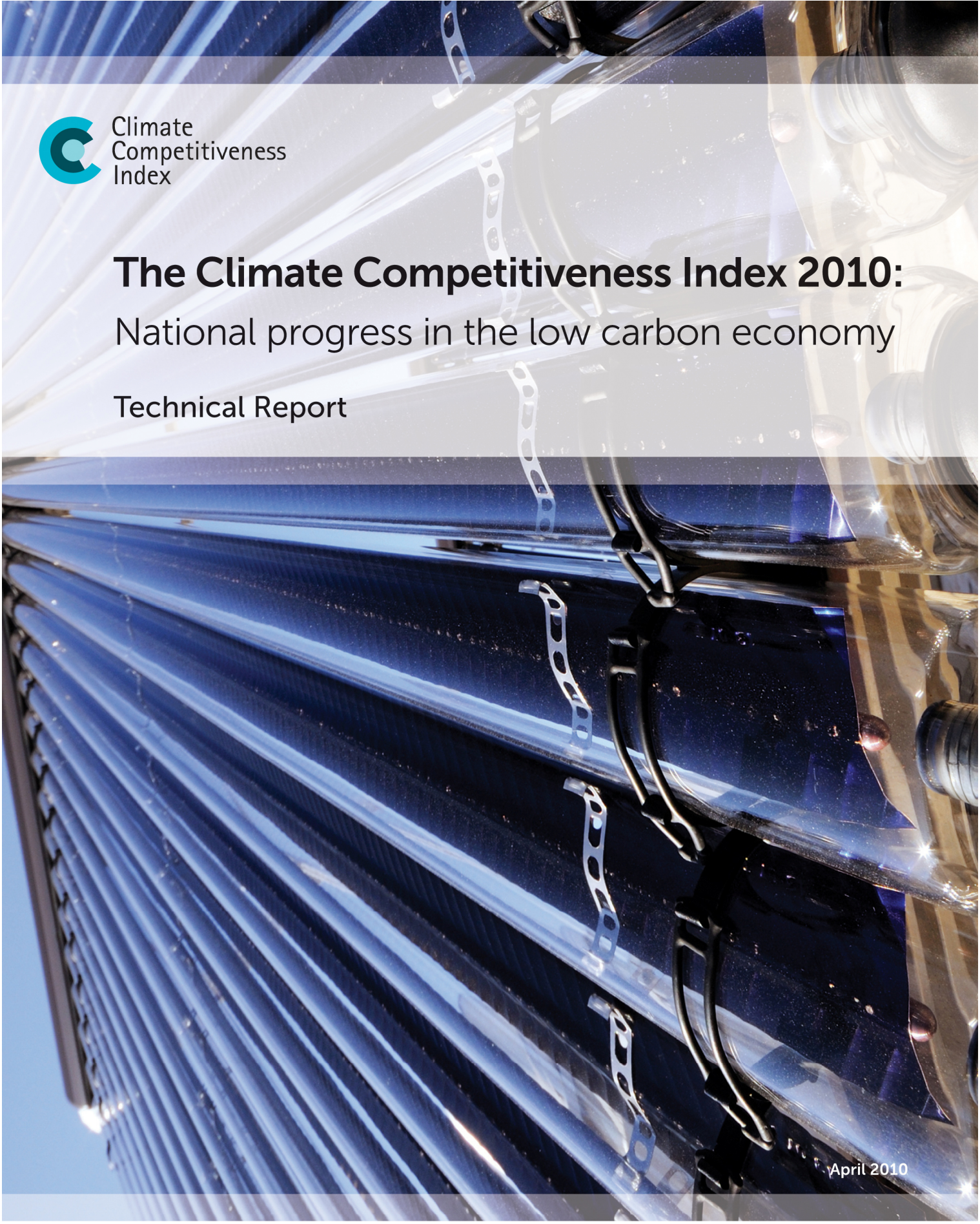

Climate Competitiveness Index

The Climate Competitiveness Index 2010:

National progress in the low carbon economy

Technical Report

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Abstract

The paper presents a range of indicators assembled to measure how countries are progressing to the low carbon economy. The indicators have been selected for their bearing on national competitiveness strategies. The Climate Competitiveness Index combines two sub-indexes measuring climate accountability and climate performance in 95 nations.

The Climate Accountability Index uses new data to assess leadership, policies, commitments and communication of key government institutions such as the Ministries of Finance and Energy, business institutions such as national chambers of commerce, investment promotion agencies and stock exchanges, and consumer bodies. Some 150 indicators for each country are organised into four equally weighted sub-themes: national leadership, strategy and coordination, investment promotion and business support, and citizen engagement.

The Climate Performance Index combines equally weighted sub-themes to analyse incentives and price signals, awareness and risk management, access to clean electricity and intensity emissions trends. The results show a mild positive correlation between accountability and performance in 95 countries.

The mean of the two sub-indexes can be taken as the Climate Competitiveness Index. This construct is in turn positively correlated to leading indicators of national income, human development and competitiveness. The paper demonstrates the feasibility of constructing a robust multi-country index of climate competitiveness. The findings highlight the importance of understanding the relationships between accountability and performance in the development of climate change strategies.

Understanding Climate Competitiveness

Climate competitiveness can be defined as the ability of an economy to create enduring economic value through low carbon technology, products and services. As such, it is a concept that draws on a long tradition of studies of national competitiveness (Porter, 1990).

Reliable metrics for climate competitiveness could be useful for researchers and decision-makers to assess the potential of countries, cities or companies to create medium-term

economic value in a global low carbon market estimated to be worth US$2 trillion or more in 2020 (HSBC, 2009).

The Climate Competitiveness Index (CCI) 2010 has been constructed to study national performance in creating low carbon strategies. The hypothesis is that climate competitiveness combines an ambitious and inclusive strategy (defined here as 'accountability') and the capabilities and track record to implement it (defined here as 'performance').

The CCI is the first large-scale multi-country effort to analyse climate competitiveness. The 2010 Index analyses 95 countries, responsible for 97 percent of global economic activity and 96 percent of carbon dioxide emissions. The CCI combines a range of climate-related indicators already available in the public domain with new climate-related data generated by a team of analysts at AccountAbility. Current measures of international competitiveness, such as those developed by the World Bank/IFC and the World Economic Forum, do not include a significant number of indicators on the economics of climate change.

Measuring climate performance

Climate change is a pressing global concern that will bring risks, costs and opportunities to economies around the world (Stern, 2007). It presents a major challenge for development and poverty eradication, impacting low-income countries that are dependent on weather-sensitive resources such as agriculture (Kramer, 2007). It will alter countries' exposure to disease, drought, flooding and sea-level rise, among other impacts. Making the shift to low-carbon, climate resilient development pathways will also require new industrial development strategies that integrate macroeconomic objectives with coherent priorities for incentives, regulation, investment and control mechanisms (UNDESA, 2009).

All countries will need to develop strategies to manage climate change. "Adaptation and mitigation need to be integrated into a climate-smart development strategy that increases resilience, reduces the threat of further warming, and improves development outcomes", advises the World Bank in the *World Development Report 2010*. The US Interagency Climate Change Adaptation Task Force recently reported the "need to build resilience to help minimise the risks associated with climate change and maximise any opportunities that climate

change may create."[1] Understanding how nations are building strategies for the low carbon economy will thus become an important part of the public policy debate on climate change.

Existing multi-country climate change studies tend to rely on the most readily available climate change data, notably carbon emissions per capita and emissions intensity (expressed as kg CO_2/US$1000 GDP). While carbon emissions intensity can provide insights into the energy consumption of different economies, it can be a misleading indicator when used in national comparisons and international climate policy (Burck et al, 2010). These investigations are at the forefront of multi-dimensional analytics to identify national responses to climate change (Exhibit 1).

Better indicators are required to measure progress towards the low carbon economy. “For the most part, the climate competitiveness debate has proceeded in the absence of hard data”, warns Eileen Claussen of the Pew Center on Global Climate Change (Aldy & Pizer, 2009). One strand of econometric studies have taken as their starting point the assumption that climate competitiveness refers to the primarily adverse business impacts related to domestic climate policies in the absence of regulation on international competitors. Several studies have developed methodologies to compare and contrast opportunities as well as costs between nations. Researchers have assessed National Adaptation Programmes of Action and Poverty Reduction Strategy Papers (UNDP, 2007; Project Catalyst, 2009), governmental policies and pledges (Climate Action Tracker, 2009; Vivid Economics, 2009), the role of the private sector (Innovest, 2007), or the role of fiscal stimuli in supporting the transition to a low carbon economy (Höhne *et al*, 2009).

Other multi-country studies have taken broader perspectives to gauge the performance of countries. The Tyndall Centre has explored the relationship between risk, (socially-constructed and natural) vulnerability, and adaptive capacity by assessing 46 indicators (Brooks et al, 2005). Analysis by Germanwatch looks at national emission trends and emissions levels, and national and international climate policy (Burck et al, 2010). These investigations are at the forefront of multi-dimensional analytics to identify national responses to climate change.

[1] http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100315-interagency-adaptation-progress-report.pdf

Exhibit 1: Carbon intensity and human development index

Most researchers accept that progress is hampered by the lack of up-to-date, relevant and comprehensive data on the socio-economic impacts of climate change for large country samples.

Exhibit 2 details the approach, periodicity and country coverage of some research studies intending to cover large country samples, highlighting challenges surrounding reliable data. The quality of global data for climate change metrics – indeed for environmental metrics more broadly – would benefit from a major upgrade.

The Climate Competitiveness Index aims to supplement these efforts to capture the depth of commitment, quality of pledges and tangible actions while taking expanding the scope to consider activities across the entire economy. This approach brings new perspectives to understand how countries are competing in the low carbon economy and takes a significant step to identifying which strategies are proving to be effective. On the basis of this literature, the CCI looks at two distinct dimensions: climate accountability and climate performance (see Exhibit 3).

Exhibit 2 Examples of leading exercises to measure progress towards the low carbon economy (non-exhaustive).

Name of study	Organisation	Country coverage	Frequency of update	Scope	Source
Global Climate Change Policy Tracker	Deutsche Bank Climate Change Research	109 countries	Launched October 2009. Updated March 2010 for subset.	269 policies covering industry, sector and national targets to determine carbon abatement potential, legal status & related emissions targets. Investor risk guide analyses each policy looking at country track record, implementation capacity & public financing.	http://www.dbcca.com/dbcca/EN/investment_research.jsp
Global Adaptation Atlas	Resources for the Future	245 countries	Under construction. Intended to become online platform	Real-time online platform to measure climate adaptation. Users can zoom down to neighbourhoods in cities to identify vulnerability. Provides guide to news on food, water, land, health & livelihoods.	www.adaptationatlas.org
G20 Low carbon competitiveness	Vivid Economics, the Climate Institute, E3G	The G20 members (19 countries but the performance of the EU as a whole is not considered)	Update status uncertain.	Econometric analysis of country capacity to succeed in a low carbon future. Multi-dimensional assessment using 19 variables to assess sectoral composition, early preparation activities & indicators of future prosperity (e.g population growth, cost of business state-up).	http://www.videconomics.com/docs/
Climate Action Tracker	Ecofys, Climate Analytics and Potsdam Institute for Climate Impact Research (PIK)	23 largest emitters (including the EU 27)	Regularly updated online portal	Web-based analysis providing assessment of national pledges. Evaluates details in countries' proposals & projected actions & uses scenarios to consider how these pledges contribute towards global goal of 2°C.	http://www.climateactiontracker.org/

Climate Cooperation Index	Swiss Federal Institute of Technology	198 countries	Updated twice since launch in 2008.	Climate Cooperation Index analyses how nations are supporting global climate action . It assesses five areas: track record to sign and ratify the Kyoto Protocol and the UNFCCC; payment record of countries to UNFCCC; trend in CO2 emissions; & submissions to the UNFCCC. -	Baettig, M. B., (2008) Measuring countries' cooperation within the international climate regime, *Environmental Science and Policy*, 633.

Measuring climate accountability

"We must have a mechanism to review whether we are keeping our commitments, and to exchange this information in a transparent manner. These measures need not be intrusive, or infringe upon sovereignty. They must, however, ensure that an accord is credible, and that we are living up to our obligations. For without such accountability, any agreement would be empty words on a page."

Barack Obama, UNFCCC COP 15 Climate Change Conference at Copenhagen[2]

The issue of climate accountability became salient in international climate discussions during 2009. The importance of accountability has been understood for a number of years (Biermann *et al.* 2010). It is one of the key indicators of the ability of a country to adapt to climate change. Brooks *et al.* (2005) identified 'voice and accountability', government effectiveness, sanitation and life expectancy as the leading indicators of national adaptation capacity.

The research measured voice and accountability using generic indicators: citizen participation in the selection of government, freedom of expression, freedom of association and media freedom. Researchers at the World Resources Institute, Global Governance Project,

[2] Barack Obama quoted in the Washington Post, 18th December 2009. Accessed on February 18th 2010 available online from [http://views.washingtonpost.com/climate-change/post-carbon/2009/12/remarks_by_president_obama_in_copenhagen_as_prepared.html]

International Centre for Climate Governance and One World Trust, among others, are investigating how to measure more specific aspects of accountability in climate governance at all levels from global to local (Ballesteros *et al*, 2009).

The negotiations in Copenhagen in December 2009, as well as recent controversies on climate science and the emergence of climate scepticism in the media, have all brought the issue of climate accountability into sharper focus. There is a significant issue surrounding monitoring, verification and reporting (MRV). There is an emerging debate on how to allocate financing for climate mitigation and adaptation. Policy-makers accept that there will need to be robust assurance in any multi-country assessment framework.

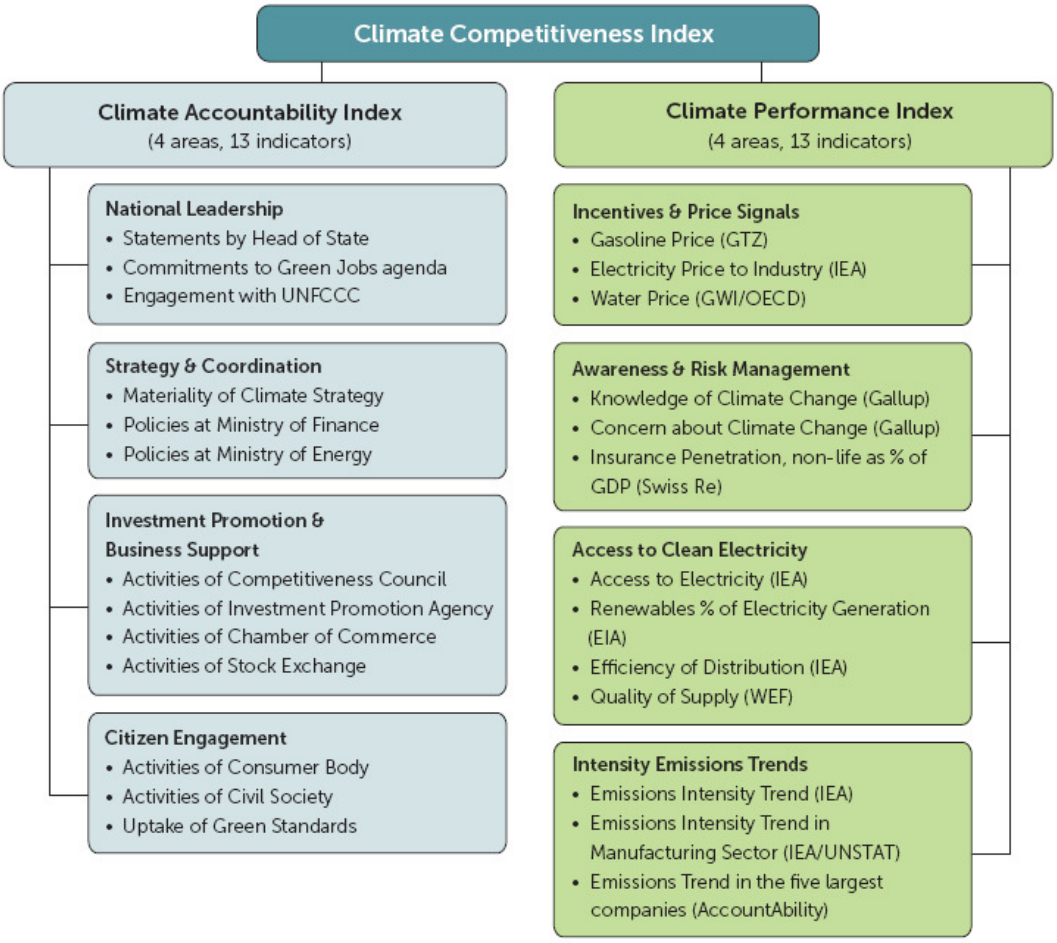
There is less consensus on what such a framework should include, or indeed what sorts of accountability principles should underpin its construction. At the least, multi-country climate metrics should cover the material issues, should include all key stakeholders (including a critical mass of countries globally), and should be responsive to feedback (AccountAbility, 2008). This then is the context for the pilot version of the Climate Competitiveness Index. The construction of each dimension of the CCI is detailed below.

Limitations to the Climate Competitiveness Index:

Every effort was made to ensure that the Climate Competitiveness Index used testable hypotheses, a logical structure based on reliable literature, and high-quality, agreed and timely climate data for 95 countries. However, there are a number of caveats around the CCI methodology.

- Country coverage: although the CCI covers the majority of active global players, countries with 97% of global GDP and 96% global carbon emissions, it should not be taken as a complete picture of global climate change action.
- Time lag: most hard data relates to the year 2007, while the accountability data is 2009/10. There is thus a potential time delay between the two axes of the model.
- Weighting: The components of the CCI are equally weighted. There is no statistical basis for varying the weightings at this stage of index development or for Annex-1 and Non-annex 1 countries.

Exhibit 3: The Architecture of the Climate Competitiveness Index



The Climate Accountability Index

The Climate Accountability Index uses a new qualitative framework that combines over 150 pieces of information to gauge the performance of a country. It is a disclosure-focused analysis that uses a standardised excel worksheet questionnaire to address each country's readiness, leadership and action on climate change. The workbook was designed to enable analysts to gather as much relevant information as possible and looks across the 13 areas identified in the previous section (e.g. Ministry of Finance, Consumer Council etc). Each indicator used in the framework was selected on the

grounds that there is a coherent theoretical or empirical basis at multi-country level that the indicator can drive economic performance. Other institutions such as the Ministry of Employment were analysed for a small sub-set of 12 countries but these were not considered the 2010 CCI as the majority of countries did not describe relevant climate efforts.

The assessment for countries is based on a qualitative judgement in line with existing approaches (e.g. Kramer, 2007; Bernstein and Greenwald, 2009). An equal search time is allocated to each country (7.5 hours) and the same analytical approach is used for all countries (including Annex 1 and non-Annex 1). Questions captured information made available to the public over the preceding 12 months prior to the date of analysis (September 2008 – August 2009, then re-analysed after the Copenhagen Summit). The results for each country were subjected to rigorous quality control process that saw all scores and information double-checked by another analyst. The margin of error between analysts is less than 3%.

The Climate Accountability Index organises this data in four equally weighted domains: National Leadership, Strategy and Coordination, Investment Promotion and Business Support, and Citizen Engagement.

1. National Leadership

The Office of the Head of State: Commitment to achieving success in the low-carbon economy is measured by a systematic analysis of recent speeches by national leaders. This indicator gauges the strength of commitments made by national leaders through assessing online transcripts of speeches given over a 12 month period. In cases where there is shared national leadership the United Kingdom where there is a Prime Minister and a Monarch, analysts have assessed speeches made by the elected leader. Where necessary, analysts use the list provided by the US Central Intelligence Agency (https://www.cia.gov/library/publications/world-leaders-1/index.html) to determine the country's official leader.

Analysts collected 27 pieces of information, to unpack issues such as:

- Is the national leader supportive of the low carbon economy?
- Does the national leader recognise climate change as an opportunity for economic growth?

- Does the national leader discuss detail (e.g. time-specific targets for investments in renewable energy)?

For auditing and quality control purposes, analysts retained web links of all speeches containing relevant information.

Green jobs: The analysts searched for evidence that the country is committed to achieving the transition to a low-carbon economy by proactively targeting green jobs potential. The Green Jobs Initiative run jointly by the United Nations Environment Programme (UNEP), the International Labour Organisation (ILO), the International Employers Organisation (IOE) and the International Trade Union Confederation (ITUC) was the starting point for the review of country level commitments (http://www.ilo.org/integration/themes/greenjobs/lang--en/index.htm).

Engagement with the UNFCCC: The United Nations Framework Convention on Climate Change presents the broad framework for intergovernmental efforts to address the challenges posed by climate change. We reviewed how countries, through their reporting to the UNFCCC demonstrate: a. progress towards developing a national climate change strategy, b. engagement with stakeholders (businesses, citizens, etc.), and c. medium- to long-term perspectives on the availability of low-carbon opportunities.

In this section, we examined UNFCCC National Communications (NAPAs – National Adaptation Program of Action; NAMAs – Nationally Appropriate Mitigation Actions) and In-Depth Review Reports (where applicable) available on the UNFCCC official web-page (http://unfccc.int/national_reports/items/1408.php), addressing 14 issues in total.

Our analysts examined each country's UNFCCC reporting, noting:

- UNFCCC recognition of the latest country report as consistent and continuous with the aims of the previous report;
- Government support for business action to reduce GHG emissions;
- Coverage of international cooperation activities; and
- Inclusion of national projections and participation in Kyoto market–mechanisms (clean development mechanism and JI).

2. Strategy and Coordination

Quality of the Climate Strategy: The national climate change strategy is the showcase for each government's efforts to address climate change adaptation and vulnerability, as well as mitigate GHG emissions. A clear strategy outlines national GHG reduction targets, fiscal commitments for national investments, and participation in international climate discussions.

Assessing how governments respond to the challenges of climate change through their climate change strategies is a core area of research in the CCI framework. Apart from the strategies, analysts also examined 'national action plans', which in some cases accompany the strategy and set time-specific short- to medium- term goals.

The analysis was conducted using a variety of indicators, including:

- Does the government assigned responsibility to a specific body?;
- Is the political leadership actively engaged in the climate strategy development?;
- Does the strategy specifically identify national risks & opportunities associated with forest protection, diffusion of low carbon technology, energy security, etc?;
- Have efforts been made to engage a diverse array of stakeholders in strategy development?

Ministry of Finance: Transitioning to a low-carbon economy requires ambitious financial interventions. Leadership in the Ministry of Finance will unlock fiscal policy as well as investments in the areas of education, healthcare, energy, infrastructure, innovation and employment. Analysts were looking for evidence that Finance Ministers consider climate change as an opportunity for economic growth by assessing recent speeches and the latest budget. Ministers of Finance were identified from government websites and verified against the Central Intelligence Agency website (https://www.cia.gov/library/publications/world-leaders-1/index.html).

The analysis encompasses eight questions, including:

- If a country's fiscal stimulus package contains measures for low-carbon growth;
- Efforts to create 'green' jobs in the latest national budget; and

- Budget allocations for alternative energy or environmental education.

Ministry of Energy: To effectively combat climate change, full coordination is needed in national policies and objectives, notably in the national energy strategy, covering energy security, clean energy generation, energy efficiency, demand management and energy awareness. A government's energy strategy should not be at odds with its financial, environmental or climate strategies. Analysts set out to establish whether the Ministry of Energy or similar national institution frames time-specific and measurable commitments to: a. increased investments in renewable energy sources; b. financing and implementation of energy efficiency measures and c. broader promotion of a low–emissions economy through efforts to expand mass transportation, develop vehicle emission standards, and establish green building certification systems for improving energy efficiency.

Analysts assessed national energy policies by answering 13 questions, including:

- Ministerial support for a national low-carbon energy policy;
- Commitments to make investments in alternative energy sources; and
- Establishment of a national green building certification body as an indicator of efforts to tackle energy efficiency at scale.

3. Investment Promotion & Business Support

Competitiveness Council: This section aims to uncover the climate commitments of the body or bodies promoting national competitiveness (such as a National Competitiveness Centre), and whether they recognise the scale and scope of competitiveness risks and opportunities resulting from climate change. We devised nine tests related to the recognition of potential impacts of climate change on national competitiveness with a focus on:

- If the Competitiveness Centre recognises climate change as a risk/opportunity;
- If the Competitiveness Centre has a strategy to promote low carbon activities, clusters etc; and
- If the Competitiveness Centre acts as a focal point for engagement between government and business on climate change issues.

Investment Promotion Agency: Governments around the world are competing to attract foreign direct investment (FDI) to create green jobs and generate clean technologies and IP, and increase a country's overall climate competitiveness. To attract FDI, many governments have established Investment Promotion Agencies We used four tests to gauge how Investment Promotion Agencies shape the debate, create awareness and win investment opportunities in such fields as cleantech clusters, development of renewable energy, and R&D. Information on relevant bodies was sourced from the World Association for Investment Promotion Agencies (http://www.waipa.org/).

Our analysts reviewed evidence on:

- If the Investment Promotion Agency holds awards for green or low carbon innovations or leadership;
- If the Investment Promotion Agency is working on the development of low-carbon clusters, zones or centres of excellence on climate change mitigation and adaptation; and
- Collaborate with local universities and international institutions to promote clean technology.

Chambers of Commerce: A critical mass of businesses will need to embed carbon management in their core operations and create products and services which reduce the carbon footprint of their clients. Progressive chambers of Commerce are helping business members by promoting awareness, undertaking research, lobbying to encourage clean energy supply and price signals, providing training on energy efficiency and innovative technologies.

Our analysis assessed:

- If and how the Chamber of Commerce cooperates with businesses in providing information and training on a low carbon future; and
- If the Chamber of Commerce conducts research on climate change.

Stock Exchange: Carbon markets are rapidly evolving around the world - sending market signals for the price of

GHGs emissions mitigation, and fostering innovation and further technology development for carbon abatement. In some countries, carbon-trading initiatives are in the process of being established to help reduce GHG emissions. Investors are also demanding evidence that listed companies have carbon management built into their ESG and sustainable investment activities. Some stock markets, such as Sao Paulo's Bovespa, have developed environmental indexes and are integrating climate into those indexes. The analysts assessed:

- If the Stock Exchange is preparing for and supportive of carbon trading; and
- If the Stock Exchange works with businesses on carbon management.

4. Citizen Engagement

Consumer Body: Governments and businesses around the world must commit to develop and implement policies that should empower consumers, provide them with more information on sustainable life-style, and guide them to take responsibility for their personal contribution to climate change. The CCI analyses whether the relevant consumer organisation(s) provide(s) education and support to encourage consumers to make environmentally sound purchasing decisions. Information on consumer data and national consumer organisations was accessed through Consumers International (http://www.consumersinternational.org/). Analysts look to see if

- The Consumer Council is raising awareness of climate change on their website
- The Consumer Council tracks spending on climate-friendly products and services

Civil Society: Capturing civil society challenge and action is one of the most challenging areas to assess in the CCI framework. There are many high-profile local and global campaigns, for example, activities planned in 109 countries for the Global Day of Action 2010 (www.globalclimatecampaign.org/). Yet there is no reliable way to track civil society engagement or to assess what kinds of civil society interventions have been successful in promoting a low-carbon economy. Civil society organisations – and citizens more broadly – are crucial in holding governments and businesses accountable for their carbon emissions, and

for creating strong demand for cleaner products and services (Munasinghe *et al*. 2009). To gain insight into the activities of civil society, analysts probed for evidence on several issues, including:

- Activities in raising citizen awareness by civil society organisations;
- Activities promoting uptake of green products & services; and
- Effective lobbying action on government and business for climate action.

Green Standards: The promotion of energy efficiency standards enables consumers to achieve greater energy savings. Energy efficiency standards and labelling information was gathered from the online clearing platform, Collaborative Labelling and Appliance Standards Program (CLASP) (http://www.clasponline.org/index.php). Analysts assessed countries' performance in promoting voluntary and mandatory energy efficiency standards.

Improving the Climate Accountability Index

The Climate Accountability Index presents important insights into the progress of key institutions to create a low carbon economy. However, there are limitations to this approach and opportunities to improve the analysis.

- The CCI consistently analyses data in the six official UNFCCC languages (Arabic, Chinese (Mandarin), English, French, Russian and Spanish), which has implications for countries reporting climate activities only in other languages or only partially reporting in an official language.
- Search time was confined to 7.5 hours due to operational constraints, which may result in some information not being discovered.
- Institutional biases: some countries do not have a 'competent body' in existence with the remit covered by the assessment framework (e.g. a national competitiveness council, investment promotion agency). Countries with no detected institutional capability are scored the same as countries with a

competent body but no disclosed activity.

In future iterations of the index, we will seek resources to overcome these drawbacks and thus strengthen the analysis.

The Climate Performance Index

The Climate Performance Index measures how a country's systems and infrastructure supports the transition to a low-carbon economy. Given the disclosure-based methodology used for the Climate Accountability Index, the performance dimension is an important reality-check to gauge whether the country really has the capabilities and the track record to implement its climate strategy. The performance dimension is thus organised into a model of action using four components: incentives to act (price signals); drivers of action (awareness & risk management); resources to act (access to clean electricity); and action itself (emissions intensity trends).

Each of the four components is equally weighted in building the Climate Performance measure. Constructing a multi-country index on climate performance can be a frustrating exercise because there are major limitations in the quality, coverage and timeliness of international data on many relevant aspects of the subject. As a result, some promising topics could not be included in the index. However, we were able to identify 13 good quality datasets selected for the index (although even in some of these indicators, country coverage is incomplete). As Exhibit 4 illustrates, there is 88% data availability across these four performance components for the 95 countries covered in the Climate Accountability Index.

Exhibit 4: Climate Performance Index – Data availability

● Data available
○ Data unavailable

	Climate Performance Index			
	Incentives & Price Signals	Awareness & Risk Management	Access to Clean Technology	Intensity: emissions trends
Algeria	● ○ ●	● ● ●	● ● ● ●	● ● ●
Argentina	● ● ●	● ● ●	● ● ● ●	● ● ●
Australia	● ● ●	● ● ●	● ● ● ●	● ● ●
Austria	● ● ●	● ● ●	● ● ● ●	● ● ●
Bangladesh	● ○ ●	● ● ●	● ● ● ●	● ● ●
Belarus	● ○ ●	● ● ○	● ● ● ○	● ● ●
Belgium	● ● ●	● ● ●	● ● ● ●	● ● ●
Bolivia	● ● ○	● ● ○	● ● ● ●	● ● ●
Botswana	● ○ ●	● ● ●	● ● ● ●	● ● ●
Brazil	● ● ●	● ● ●	● ● ● ●	● ● ●
Bulgaria	● ○ ●	● ● ●	● ● ● ●	● ● ●
Cambodia	● ○ ○	● ● ○	● ● ● ●	● ● ●
Canada	● ● ●	● ● ●	● ● ● ●	● ● ●
Chile	● ● ●	● ● ●	● ● ● ●	● ● ●
China	● ○ ●	● ● ●	● ● ● ●	● ● ●
Colombia	● ● ○	● ● ●	● ● ● ●	● ● ●
Costa Rica	● ● ○	● ● ●	● ● ● ●	● ● ●
Cyprus	● ● ○	● ● ●	● ● ● ●	● ● ●
Czech Republic	● ● ●	● ● ●	● ● ● ●	● ● ●
Denmark	● ● ●	● ● ●	● ● ● ●	● ● ●
Ecuador	● ● ●	● ● ●	● ● ● ●	● ● ●
Egypt	● ○ ●	● ● ●	● ● ● ●	● ● ●
El Salvador	● ● ○	● ● ○	● ● ● ●	● ● ●
Estonia	● ○ ●	● ● ●	● ● ● ●	● ● ●
Ethiopia	● ○ ●	● ● ○	● ● ● ●	● ● ●
Finland	● ● ●	● ● ●	● ● ● ●	● ● ●
France	● ● ●	● ● ●	● ● ● ●	● ● ●
Germany	● ● ●	● ● ●	● ● ● ●	● ● ●
Ghana	● ○ ○	● ● ○	● ● ● ●	● ● ●
Greece	● ● ●	● ● ●	● ● ● ●	● ● ●
Guyana	● ● ●	○ ○ ○	● ● ● ●	● ○ ●
Hong Kong	● ○ ●	● ● ●	● ● ● ●	● ● ●
Hungary	● ● ●	● ● ●	● ● ● ●	● ● ●

India	●	●	●	●	●	●	●	●	●	●	●	●	●
Indonesia	●	●	●	●	●	●	●	●	●	●	●	●	●
Iran	●	○	○	●	●	●	●	●	●	○	●	●	●
Ireland	●	●	●	●	●	●	●	●	●	●	●	●	●
Italy	●	●	●	●	●	●	●	●	●	●	●	●	●
Jamaica	●	●	○	○	○	●	●	●	●	●	●	●	●
Japan	●	●	●	●	●	●	●	●	●	●	●	●	●
Jordan	●	○	●	●	●	●	●	●	●	●	●	●	●
Kenya	●	○	●	●	●	●	●	●	●	●	●	●	●
Kuwait	●	○	○	○	○	●	●	●	●	●	●	●	●
Latvia	●	○	●	●	●	●	●	●	●	●	●	●	●
Lesotho	●	○	○	○	○	○	●	●	●	●	●	○	●
Libya	●	○	○	○	○	○	●	●	●	●	●	●	●
Lithuania	●	○	●	●	●	●	●	●	●	●	●	●	●
Luxembourg	●	○	●	●	●	●	●	●	●	●	●	●	●
Malawi	●	○	○	○	○	○	●	●	●	●	●	○	●
Malaysia	●	○	●	●	●	●	●	●	●	●	●	●	●
Maldives	○	○	○	○	○	○	○	●	●	○	●	○	●
Malta	●	○	○	●	●	○	●	●	●	●	●	●	●
Mauritius	○	○	○	○	○	○	●	●	●	●	●	○	●
Mexico	●	●	●	●	●	●	●	●	●	●	●	●	●
Morocco	●	○	●	●	●	●	●	●	●	●	●	●	●
Mozambique	●	○	○	●	●	○	●	●	●	●	●	●	●
Nepal	●	○	●	●	●	○	●	●	●	●	●	●	●
Netherlands	●	●	●	●	●	●	●	●	●	●	●	●	●
New Zealand	●	●	●	○	○	●	●	●	●	●	●	●	●
Nigeria	●	○	●	●	●	●	●	●	●	●	●	●	●
Norway	●	●	●	●	●	●	●	●	●	●	●	●	●
Pakistan	●	○	●	●	●	●	●	●	●	●	●	●	●
Papua New Guinea	●	○	○	○	○	○	●	●	●	○	●	○	●
Peru	●	●	●	●	●	●	●	●	●	●	●	●	●
Philippines	●	○	●	●	●	●	●	●	●	●	●	●	●
Poland	●	●	●	●	●	●	●	●	●	●	●	●	●
Portugal	●	●	●	●	●	●	●	●	●	●	●	●	●
Republic of Korea	●	●	●	●	●	●	●	●	●	●	●	●	●
Romania	●	●	●	●	●	●	●	●	●	●	●	●	●
Russia	●	●	●	●	●	●	●	●	●	●	●	●	●
Rwanda	●	○	●	●	●	○	●	●	●	○	●	○	●
Saudi Arabia	●	○	●	●	●	●	●	●	●	●	●	●	●
Singapore	●	●	●	●	●	●	●	●	●	●	●	●	●
Slovakia	●	●	●	●	●	●	●	●	●	●	●	●	●
Slovenia	●	○	○	●	●	●	●	●	●	●	●	●	●
South Africa	●	●	●	●	●	●	●	●	●	●	●	●	●
Spain	●	●	●	●	●	●	●	●	●	●	●	●	●
Sri Lanka	●	○	●	●	●	●	●	●	●	●	●	●	●
Sweden	●	○	●	●	●	●	●	●	●	●	●	●	●
Switzerland	●	●	●	○	○	●	●	●	●	●	●	●	●
Syria	●	○	●	●	●	●	●	●	●	●	●	●	●
Taiwan	●	●	●	●	●	●	●	●	●	●	●	○	●

Tanzania	●	○	○	●	●	○	●	●	●	●	●	●	●
Thailand	●	●	○	●	●	●	●	●	●	●	●	●	●
Turkey	●	●	●	●	●	●	●	●	●	●	●	●	●
Turkmenistan	●	○	●	○	○	○	●	●	●	○	●	●	●
Uganda	●	○	○	●	●	○	●	●	●	●	●	○	●
Ukraine	●	○	●	●	●	●	●	●	●	●	●	●	●
United Arab Emirates	●	○	●	○	○	●	●	●	●	●	●	●	●
United Kingdom	●	●	●	●	●	●	●	●	●	●	●	●	●
United States of America	●	●	●	●	●	●	●	●	●	●	●	●	●
Uzbekistan	●	○	●	●	●	●	●	●	●	○	●	●	●
Venezuela	●	●	●	●	●	●	●	●	●	●	●	●	●
Viet Nam	●	○	●	●	●	●	●	●	●	●	●	●	●
Zambia	●	○	○	●	●	○	●	●	●	●	●	●	●

1. Incentives and Price Signals

Financial incentives and price signals are some of the main regulatory tools that policy-makers can use to address climate change (Deutsche Bank, 2009). Evidence from countries such as Germany demonstrate that policy-makers need to develop packages that achieve high carbon abatement, diversify energy sources and change the behaviour of citizens, consumers and businesses (McKinsey, 2009).

"Over 50 percent of carbon emissions globally have profitable technologies that exist today that can offset the offending technology. Market failures are in the way… capitalism doesn't work efficiently in every single sector" according to Jigar Shah, founder of one of the largest U.S.-based solar power developers.[3] Without clear and early price signals, countries are likely to lock in high-carbon infrastructure and prevent necessary investment into today's available 'green' technology (McKinsey, 2009).

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[3] Jigar Shah quoted in the New York Times, 22nd April, 2010. Branson's 'Carbon War Room' puts industry on front line of U.S. Climate Debate. Taken from: [http://www.nytimes.com/cwire/2010/04/22/22climatewire-bransons-carbon-war-room-puts-industry-on-fr-73959.html?pagewanted=2]. Accessed 22nd April 2010.

[4] Jigar Shah quoted in the New York Times, 22nd April, 2010. Branson's 'Carbon War Room' puts industry on front line of U.S. Climate Debate. Taken from: [http://www.nytimes.com/cwire/2010/04/22/22climatewire-bransons-carbon-war-room-puts-industry-on-fr-73959.html?pagewanted=2]. Accessed 22nd April 2010.

and prevent necessary investment into today's available 'green' technology (McKinsey, 2009).

The Climate Competitiveness Index combines three indicators – gasoline and water prices and the electricity price for business – as a proxy for the national incentive structure. This component makes up 25% of the Climate Performance Index.

Gasoline Price (German Technical Cooperation): Taxation of fossil fuels can help a country invest in necessary infrastructure and public transport to move towards low carbon. Also it was indicated that that citizens in countries with high fuel taxes tend to adapt to more energy efficient transport naturally. In order to address countries' efforts to transition to a low carbon economy, Gasoline Price from the International Fuel Prices study (November 2008) was used.[5] This is intended to be an annual exercise coordinated by German Technical Cooperation since 1991. A country's gasoline price (US$) is transformed to a percentage CCI score by dividing the country's actual price by the highest fuel price among 95 countries analysed.

Electricity Price to Industry (International Energy Agency): Concerns over climate change and energy security has driven the increase of electricity price to industry. As in taxation on fuel usage, Electricity Price is a significant factor in understanding a country to create a successful transition to the low carbon economy. The electricity price for industry (US$ per Kilowatt hour) was obtained from the International Energy Agency's annual data from 2008 and 2009. This dataset is significantly incomplete: a regional average was applied to countries with no available data. Each country's Electricity Price to Industry value was transformed to a percentage by dividing the country's actual electricity price (US$) by the highest price among 95 countries.

Water Price (Global Water Initiative/OECD): Water price signals are an important driver of environmental and economic cost savings, demand management and innovation. Data on water prices was sourced, for OECD member states, from the OECD annual study. For other countries, the source is the Global Water Initiative, where price in the key city or cities is used if there is no national data. The CCI percentage score was generated by dividing the actual price

[5] [http://www.gtz.de/de/dokumente/en-int-fuel-prices-6th-edition-gtz2009-corrected.pdf]

of water (US$ per cubic meter) by the highest water price among 95 countries.

2. Awareness and Risk Management

Political commitments and business action on climate change are contingent on citizen support. Citizens need knowledge and should be prepared to act on that knowledge (AccountAbility, 2008). According to polls in 127 countries by Gallup in 2007/08, "more than a third of the world's population has never heard of global warming" (Gallup, 2009). The BBC Trust has recently studied public understanding of climate change in Africa, and HSBC has commissioned surveys of climate confidence in key economies. Such surveys consistently show significant and unpredictable differences in levels of awareness and concern in different countries.

In addition to requiring action from policy-makers and businesses, citizens will increasingly take action themselves, through their housing, agriculture and consumption decisions and through being prepared for coming climate disruptions (ECAWG, 2009). Increasingly, non-life insurance is being provided to lower-income customers through non-traditional routes, such as microfinance. This component attempts to measure the level of citizen awareness and risk management by combining three indicators, and together they make up 25% of the Climate Performance Index.

***Knowledge of Climate Change (Gallup)*:** Citizens' stated knowledge about climate change is used as a variable in this component, partly as a gauge of government effectiveness in conveying climate information, and partly as a gauge of potential demand for clean products and services. Gallup, the global opinion pollster, has conducted some of the largest multi-country surveys of this sort (http://www.gallup.com/poll/117772/Awareness-Opinions-Global-Warming-Vary-Worldwide.aspx), over the period 2007 and 2008. Percentages of those saying they are aware of climate change were used to provide scores in the Performance Index.

Concern about Climate Change (Gallup): In addition to measuring citizens' knowledge and understanding of climate change, this variable assesses their level of concern about the seriousness of climate change and its consequences, to see what level of commitment to action it might generate. Data on concern from Gallup's multi-country surveys over 2007/08 on global warming was used. Percentages of

those saying they are concerned about climate change were used to provide scores in the Performance Index.

Insurance Penetration (Swiss Re): Non-life Insurance uptake is one indication of how well prepared a country's population is to cope with natural catastrophes. The greater the level of non-life insurance uptake as a percentage of GDP ("penetration"), the better the country's capacity to recover from natural disasters. Non-life insurance penetration data from reinsurance company Swiss Re was used, with the reference year being 2007. Swiss Re's data was transformed to CCI scores by setting an upper limit of 5% penetration, and converting a country's actual score as a percentage of that upper limit.

3. Access to Clean Electricity

This component assesses the country's track record in building an accessible, low-carbon, efficient electricity supply. Clean electricity is important not just because it can drive economic development (UNDESA 2009). It is also a proxy indicator of energy access and capabilities in implementing other low-carbon infrastructure and healthcare more generally (Legros *et al*. 2009).

The focus here on renewable electricity is by no means intended to imply that other lower-carbon fuels will not be important parts of the energy supply in climate competitive countries. "Abundant renewable energy is the lattice work upon which a climate consensus must grow", according to Tariq Banuri, Director of the Division for Sustainable Development at the UN Department of Economic and Social Affairs.[6] The affordability of clean electricity has not been included because of a lack of reliable data. What is needed is a measure of clean electricity prices as a percentage of household income for low-income segments, such as the lowest income quintile. This component makes up 25% of the Climate Performance Index.

Access to Electricity (International Energy Agency): The population's access to electricity is an important development indicator (UNDESA, 2009), particularly in rural areas and in Africa and South Asia was included as a Performance Index variable in order to indicate a country's energy status and human development level. Annual data generated by the International Energy Agency[7] was used

[6] http://www.un.org/esa/dsd/dsd/dsd_direbiog.shtml

[7] [http://www.worldenergyoutlook.org/database_electricity/electricity_access_database.htm]

and the actual score was used as a percentage score in the Performance Index.

Renewables % of electricity generation (Energy Information Administration): A country's current level of renewable energy usage is a partial gauge of its readiness to develop clean energy in the future. The share of renewables as % of total electricity generated within the country was obtained from the US Energy Information Administration's annual data from 2007 and 2008. The actual score was used as a percentage score in the Performance Index.

Efficiency of Distribution (International Energy Agency): A country's energy distribution network is an important part of its low carbon infrastructure and a guide as to its capabilities in energy saving. The International Energy Agency's annual data series indicating % electricity generation lost in distribution was used to measure countries' efficiency of energy distribution. The actual score was used as a percentage score in the Performance Index.

Quality of Electricity Supply (World Economic Forum): An efficient and reliable electricity supply system assists a country's transition to a low carbon economy by delivering electricity to businesses and factories without disruptions and shortages. Countries' score on the Quality of Electricity Supply (2.07) is an Infrastructure pillar of the World Economic Forum's Global Competitiveness Index[8] and was used to indicate reliability of electricity supply. The perception based score (0- 7) was converted to a percentage.

4. Emissions Intensity Trends

Finally, it is important to assess each country's actual track record in managing carbon out of the economy – at the economy-wide level, at the sector level, and at the micro level among businesses (e.g. Innovest, 2007). As discussed above, emissions intensity can be a crude or even misleading indicator in making international comparisons. However, this component does include two measures of energy intensity (one at economy-wide level and one within the manufacturing and construction sectors), as well as a new assessment about the track record of leading businesses in managing emissions. This component makes up 25% of the Climate Performance Index.

[8] [http://www.weforum.org/pdf/GCR09/GCR20092010fullreport.pdf]

Emissions Intensity Trend (International Energy Agency): The emissions intensity trend of a county over the Kyoto period (from 1990 to the most recent year of 2007) provides some insights into how the country's core industrial sectors are re-shaping in accordance with their economic development. The annual International Energy Agency study on emission intensity trend was used to comprise this variable. In order to transfer the score into a percentage for the CCI, the percentage intensity reduction (or increase) over the period 1990-2007 was divided by the highest score among the 95 countries.

Emissions Intensity Trend in Manufacturing and Construction Sectors (International Energy Agency and United Nations Statistical Division): In order to control for the wide differences in industrial structure between the countries of the sample, this indicator looks at the emissions intensity trend in the manufacturing and construction sector alone – which provides a more level playing field to gauge performance. Information on CO2 emissions in manufacturing and construction for 2007 was from International Energy Agency and information about these sectors' share in national GDP for 2007 is from the United Nations Statistical Division. To transform the intensity data into a percentage score, the data was inverted and then divided by the highest score achieved by the 95 country sample, with a low-scoring cut-off of 1.5 kg/$1 to exclude outliers.

Top Five Businesses' Emissions Trend (AccountAbility): The carbon management performance of the five largest publicly-listed companies headquartered in a country was used as a proxy of how big businesses are tackling climate change. Analysts identified the five largest companies in each country from stock exchanges, local media and international rankings (avoiding local branches of multinational companies) and analysed the websites of the largest companies to see if a company is reporting CO2 emissions, and if they have managed to reduce CO2 intensity (e.g. kg CO_2/US$1000 revenue)year on year. Maximum scores were awarded to companies that reported a year on year decrease in CO_2 intensity with a full audit trail.

Improving the Climate Performance Index

The Climate Performance Index presents relevant multi-country data that is available in the public domain. Each

indicator was reviewed for quality and verifiability and any measures that did not meet our baseline quality standards were discarded. Despite this, there are still caveats associated with the index:

- For some indicators, data is missing for some countries, particularly for low-income countries and small island states (see Exhibit 4). To overcome this, regional averages were applied to three variables to enable the inclusion of some countries with patchy data coverage.
- Time lag: most hard data relates to the year 2007, while the accountability data is 2009/10. There is thus a potential time delay between the two axes of the model.
- Weighting: The four components of the index are equally weighted. There is no statistical basis for varying the weightings at this stage of index development so the most transparent method has been adopted.

More research is required to fill these data gaps on key indicators.

Results

The Climate Competitiveness Index presents a comprehensive analysis into how countries around the world are preparing for the low carbon economy. The work reveals ten key findings:

1) *Countries that have strong climate performance generally have higher levels of climate accountability. Less strong performers tend to be less accountable.* While there are many exceptions to this pattern, and only anecdotal evidence as yet on causality between the two dimensions, prudent climate strategies will focus on strengthening both dimensions.

2) *There has been an increase in climate accountability since the UNFCCC Copenhagen conference in December 2009.* Nearly half (46%) of the countries assessed have improved their climate accountability somewhat or significantly, suggesting the Copenhagen Accord has had a positive impact, with improved climate competitiveness registering in 32 countries. Major climbers include Rwanda, Kenya and Ghana, and from the OECD, Republic of Korea and Ireland. These developments demonstrate the importance of debate and citizen action in strategy development.

3) *There are examples of good practice to be shared in dozens of*

countries [see Exhibit 4]. In most countries, here is still plenty of room for improvement among many of the competitiveness actors. Specifically, much more can be done by business associations, competitiveness and investment agencies, stock exchanges and consumer groups to promote more business action.

4) *Each country will have a distinctive competitiveness strategy, but some broad patterns are discernible in different regions and in different economic clusters*. For example, Bolivia, Ghana, Vietnam and Bangladesh all demonstrate strong citizen concern coupled with limited business engagement. Emerging economies like Brazil and the Philippines enjoy strong government leadership. In other cases, leadership is evident in the business community, for example in Scandinavia and Singapore. However, climate leadership will increasingly require engagement from most or all stakeholders.

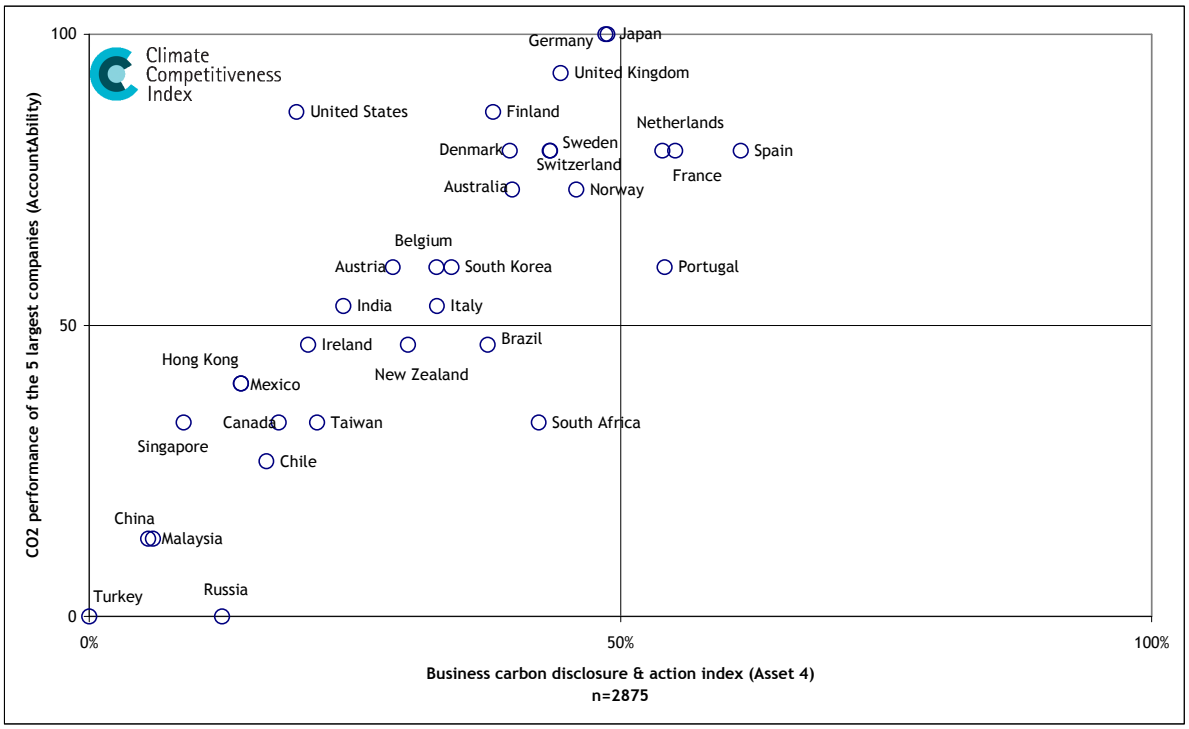
5) *Climate accountability is becoming a vote-winner for governments and parliamentarians*. Citizens are demanding visible, coherent and tangible climate leadership from national leaders. Many politicians are opening dialogues to gauge opinions. Climate accountability is becoming a key differentiator in elections, for example in Brazil, Japan and the UK. In the Republic of Korea, the President's office has engaged with numerous stakeholders to create the 'Low Carbon Green Growth Strategy'.

6) *Climate competitiveness is* not *dictated by income level, despite strong performance on the Index by many northern European countries* The Philippines is highly accountable and has made green jobs a political priority. Guyana, China, Chile, Mauritius and South Africa are all building distinctive strategies for low carbon competitiveness. There is no evidence for a climate Kuznets Curve or that resource endowments dictate national performance.

7) Consistency is the key to climate competitiveness. Northern European countries, notably Germany, France, the UK and Nordic countries, have the most consistent performance across the eight domains and between accountability and performance. In North America and Australia, there is a telling mismatch between citizen concerns and price signals, and divergent views within the business community and in politics. The BASIC states outperform the rest of the G20 on accountability. Latin American countries are stronger on performance than

accountability. In Asia, the Middle East and in Africa, there is high variability in both performance and accountability.

Exhibit 5: Carbon management by the largest five companies is a reasonable proxy for business carbon management more broadly

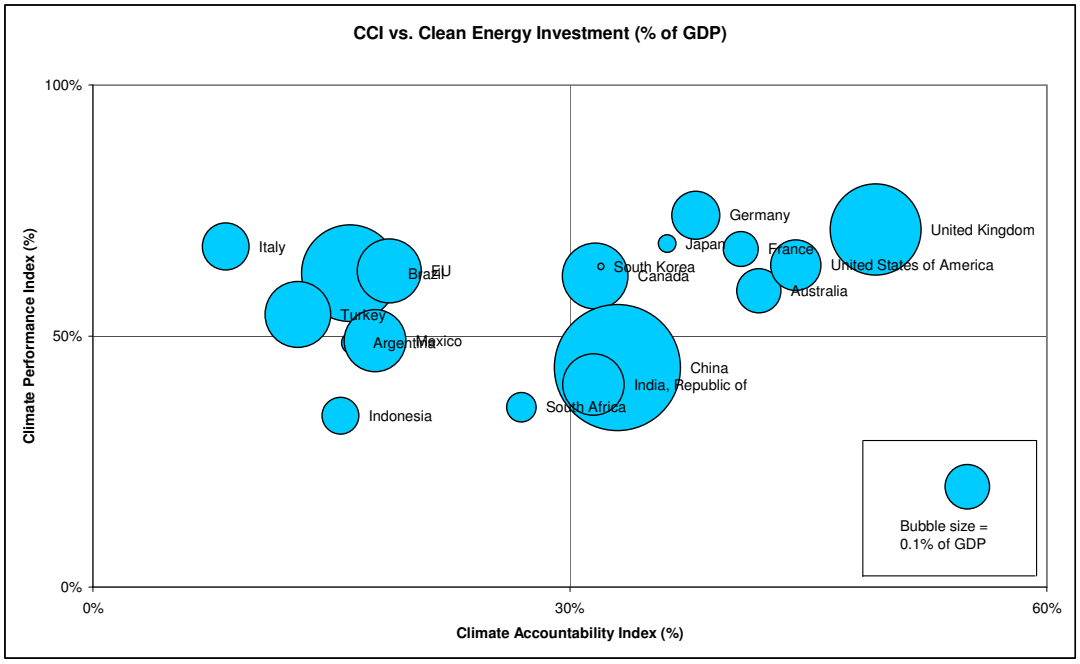


8) *Climate action in the private sector is crucial for climate competitiveness.* Strong performance on the CCI by Japan, Republic of Korea, Germany, the Nordics and the USA is manifested by active engagement by the largest firms in reducing their emissions and offering low carbon products and services.

Emissions disclosure and trends for the five largest companies is positively correlated to broader carbon management trends in the business sector, based on a study for 30 countries undertaken by AccountAbility and Asset4 (now Thomson Reuters).

Exhibit 5 demonstrates that economies where the largest five companies are reporting and reducing their carbon dioxide emissions are more likely to have a broader group of companies developing low carbon process, products and services. This finding suggests that engaging the larger businesses is an important first step in countries such as Bolivia, Ghana, Vietnam and Bangladesh where there is strong citizen concern but limited business engagement to date.

Exhibit 6: The Climate Competitiveness Index and Clean Energy Investment



Sources: AccountAbility's own analysis, the International Monetary Fund and Pew Centre.

9) *Companies and countries are scrambling to win share in new markets.* The clean energy sector, estimated to be worth USD200 billion in 2010, has seen rapidly growing investment in recent years, with a moderate setback due to the 2009 downturn. Low-carbon street lighting is a good example of fierce competition. Trials of rival LED technologies, running in Hong Kong, New York, Tianjin and Toronto will dictate success for companies in what is expected to be a USD1 billion market in 2010. Countries such as Turkey, Italy, the USA and China have all

increased their investments in clean energy by over 100% in the last five years. It is of concern that significant investments are being made in some countries with only moderate levels of climate accountability [See Exhibit 6].

10) *The countries most vulnerable to climate change do not yet have the accountability and capacity they will require to adapt and thrive.* Proactive adaptation policies are being developed in countries like Bangladesh, Cambodia and the Maldives, but international support will be needed for many countries to build climate resilient growth strategies. This support includes the current offerings of climate models, mitigation menus and strategy advice, but also needs to encompass capacity building for all the key actors in climate competitiveness, including business associations, trades unions, stock exchanges and civil society and consumer groups.

Discussion: Upgrading the CCI

"Developing the Climate Competitiveness Index and the accompanying analysis has also made us even more aware of shortcomings in the underlying data and the need to push for more robustness and comprehensiveness for the index to become even more meaningful and applicable in the coming years."

Achim Steiner, UN Under-Secretary General and Executive Director United Nations Environment Programme

The variability of results in the CCI suggests that it is necessary to look broadly across the policies, pledges and performance of countries to understand national performance and accountability. The CCI results suggest that over-reliance on a limited number of indicators such as economy-wide carbon dioxide intensity may be misleading for comparison between countries. Our analysis also suggests that using proxy indexes such as the Human Development Index or Global Competitiveness Index has limited analytical value in the climate space.

Caveats notwithstanding, the broad results of the CCI 2010 confirm that a dedicated multi-country index looking at the economic potential of strong climate change strategies and institutions does offer policy and research insights, and that it is technically feasible.

The emerging field of climate competitiveness metrics depends on the continuous upgrading of data supplied by the international agencies identified in this report. Improved data quality, coverage and timeliness will enable real-time tracking of progress across countries, identifying countries that are implementing effective strategies, and sharing knowledge on successful low carbon growth strategies more rapidly.

Understanding the current limitations in provision of good quality data is the first task in improving availability. Collaborating with the UNFCCC, and involving other index constructors, to make consistent and realistic requests to data agencies is the right way forward. Such agencies include both international and intergovernmental agencies as well as for-profit businesses (e.g. opinion polling organisations).

The CCI findings suggest that there is no single blueprint or pathway to climate competitiveness. Countries and regions are pursuing distinctive climate strategies based on national priorities and capabilities. On the other hand, the research emphasises the importance of action within the business sector. Businesses and business support infrastructure will increasingly play a central role in promoting climate competitiveness. Initiatives like the Carbon Disclosure Project as well as business schools and other research organisations will want to evaluate methods for engaging businesses in all countries in carbon management.

The international associations that support national business associations will also want to promote knowledge and engagement among their national members, such as the International Chamber of Commerce (www.iccwbo.org/), the World Federation of Exchanges (www.world-exchanges.org/), the World Association of Investment Promotion Agencies (www.waipa.org/), competitiveness agencies (WEF, IMD, Competitiveness Institute), sustainability standards bodies (including Collaborative Labelling and Appliance Standards Program (CLASP) http://www.clasponline.org/index.php and ISEAL), and Consumers International (www.consumersinternational.org/). One interesting option to strengthen the accountability analysis would be to develop a network of in-country research partners working to a consistent methodology but with the research and language capabilities to deepen the analysis. Findings could be subjected to

centralised quality control and aggregation, potentially via a collaborative global platform. Such an approach would offer the following advantages:

- *Materiality*: moving from reliance on web-based disclosure to broader accountability issues(e.g. local researchers can gauge the issue of *responsiveness* and test the degree of inclusion of stakeholders in strategy development);
- *Inclusiveness*: there is potential for greater engagement and rigour as local researchers can undertake direct dialogue with individuals in key institutions and can also probe the realities of performance within the context of national competitiveness priorities.
- *Capacity-building*: there will be value in enhancing the abilities of local research teams to build their knowledge of climate competitiveness metrics, and there may be the possibility of increasing country coverage to c.100-140 countries.

Upgrading the CCI through better hard performance data and moving to a decentralised model of accountability data gathering both have resourcing and management implications for index builders. However, the resources required would be within the same order of scale as the annual *Doing Business* survey coordinated successfully by the IFC and World Bank at a small fraction of the costs of running international climate negotiations and funds.

Further reading:

More details about The Climate Competitiveness Index 2010 are available online and in the summary project report available at www.climatecompetitiveness.org.

References

AccountAbility (2008) *AA1000 Accountability Principles*, London.

AccountAbility (2008) *What Assures Consumers on Climate Change?,* London.

Aldy, J. & Pizer, W. (2009) *The Competitiveness Impacts of Climate Change Mitigation Policies*, Resources for the Future for Pew Center on Global Climate Change, Arlington VA.

Baettig, M., Wild, M & Imboden, D (2007) 'A Climate Change Index: Where Climate Change May be Most Prominent in the 21st Century'. *Geophysical Research Letters*, vol. 34.

Ballesteros, A., Nakhooda, S. & Werksman, J (2009) *Power, Responsibility and Accountability: Re-Thinking the Legitimacy of Institutions for Climate Finance*, World Resources Institute, Washington DC.

Biermann, F., Pattberg, P. & Zelli, F (eds) (2010) *Global Climate Governance Beyond 2012: Architecture, Agency and Adaptation*, Cambridge.

Brooks, N. & Adger, W. N. (2005). Assessing and enhancing adaptive capacity. In B. Lim & E. Spanger-Siegfried (Eds.) *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*, pp 165-181. UNDP-GEF. Cambridge University Press.

Deutsche Bank (2009) *Infrastructure Investments in Renewable Energy*. September 2009.

ECAWG (2009) *Shaping Climate Resilient Development: a framework for decision-making*, Economics of Climate Adaptation Working Group, Swiss Re etc.

Grubb, M et al (2009) *Climate Policy and Industrial Competitiveness: Ten Insights from Europe on the EU Emissions Trading System*, Climate & Energy Paper Series, July 2009, German Marshall Fund.

Gallup (2009) "Awareness, Opinions About Global Warming Vary Worldwide", [http://www.gallup.com/poll/117772/Awareness-Opinions-Global-Warming-Vary-Worldwide.aspx], April 2009.

Hartmann, A., Riese, J, Vahlenkamp (2008) *Cutting Carbon, not economic growth: Germany's path*, McKinsey and Company.

Höhne, N, Phylipsen, D, Moltmann, S (2009) *Factors underpinning future action 2007 update*, Ecofys/DEFRA.

Kramer, A., (2007) *Adaptation to Climate Change in Poverty Reduction Strategies.* UNDP, Human Development Report Office Occasional Paper. 2007/34.

Legros, G, Havet, I, Bruce, N. & Bonjour, S (2009) *The Energy Access Situation in Developing Countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa*, UNDP & WHO, New York.

McKinsey, (2009) *Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve*, London.

Munasinghe M., Dasgupta P., Southerton D., Bows A., McMeekin A. (2009) *Consumers, Business and Climate Change*, Sustainable Consumption Institute, University of Manchester.

Porter, M (1990) *The Competitive Advantage of Nations*, Free Press.

Reinaud, J (2005) *Industrial Competitiveness Under the European Union Emissions Trading Scheme*. International Energy Agency. Paris.

Stern, N (2007) *Stern Review on the Economics of Climate Change*. Cambridge University Press.

UNDESA (2009) *World Economic and Social Survey 2009: Promoting Development: Saving the Planet*. UN Department of Economic and Social Affairs, New York.

Annex

Pearson's Product moment analysis of the relationships between CCI

	Statement by Head of State	Commitments to Green Jobs agenda	Engagement with UNFCCC	National Leadership	Materiality of climate strategy	Policies of Ministry of Finance	Policies of Ministry of Energy	Strategy & Coordination	Activities of Competitiveness Council	Activities of Investment Promotion Agency	Activities of Chambers of Commerce	Activities of Stock Exchange	Investment Promotion & Business Support	Activities of Civil Society	Activities of Consumer Body	Uptake of Green Standards	Citizen Engagement	**Climate AccountAbility Index**	Super gasoline prices at the pump US$/l (GTZ Nov 2008)	Cost of water [$/m3, GWI/OECD 2008]	Cost of electricity to industry [US EIA, 2007 or MRY]	Incentives: price signals (gasoline, water, electricity)	Know something/a great deal about climate change (Gallup 2007/08)	Global warming a serious personal threat(Gallup 2007/08)	Property Insurance penetration [Swiss Re, 2007]	Awareness & preparedness	Electricity distribution efficiency (IEA 2007)	Quality of electricity supply (WEF 2.07, 2009/10)	Access to electricity (IEA, electricity access database 2008)	Renewables as % of total electricity generated (IEA database 2008/07)	Access to clean electricity	CO2 emissions trend of the largest 5 companies score (AA)	Emissions intensity trend CO2/GDP PPP 1990-2007 (IEA 2009)	CO2 emissions per $1000 GDP in manufacturing & construction	Intensity & trends	Climate performance index	**Overall score**
Statement by Head of State		0.46	0.42	0.81	0.57	0.55	0.53	0.71	0.26	0.37	0.29	0.31	0.49	0.53	0.32	0.35	0.57	**0.78**	0.19	0.20	0.11	0.16	0.27	0.07	0.16	0.21	0.33	0.33	0.13	-0.14	0.22	0.51	0.03	0.14	0.37	0.30	**0.59**
Commitments to Green Jobs agenda	0.46		0.43	0.77	0.28	0.30	0.32	0.40	0.15	0.39	0.46	0.29	0.52	0.42	0.18	0.18	0.38	**0.61**	0.23	0.34	0.23	0.31	0.33	0.25	0.27	0.24	0.25	0.33	0.20	-0.14	0.24	0.54	0.17	0.18	0.44	0.41	**0.56**
Engagement with UNFCCC	0.42	0.43		0.79	0.41	0.46	0.34	0.51	0.07	0.47	0.20	0.37	0.45	0.60	0.32	0.18	0.53	**0.69**	0.32	0.41	0.29	0.38	0.32	0.25	0.26	0.37	0.22	0.32	0.27	0.05	0.41	0.65	0.10	0.31	0.54	0.52	**0.67**
National Leadership	*0.81*	*0.77*	*0.79*		*0.54*	*0.56*	*0.51*	*0.69*	*0.20*	*0.52*	*0.39*	*0.41*	*0.61*	*0.66*	*0.35*	*0.21*	*0.63*	**0.88**	*0.31*	*0.40*	*0.26*	*0.35*	*0.39*	*0.23*	*0.29*	*0.28*	*0.34*	*0.41*	*0.25*	*-0.09*	*0.37*	*0.71*	*0.12*	*0.26*	*0.57*	*0.52*	**0.77**
Materiality of climate strategy	0.57	0.28	0.41	0.54		0.37	0.35	0.61	0.26	0.33	0.26	0.14	0.39	0.32	0.26	0.14	0.34	**0.57**	0.24	0.21	0.27	0.28	0.29	0.18	0.14	0.26	0.22	0.28	0.22	-0.15	0.19	0.41	0.17	0.19	0.39	0.35	**0.51**
Policies of Ministry of Finance	0.55	0.30	0.46	0.56	0.37		0.37	0.79	0.14	0.38	0.32	0.44	0.51	0.54	0.41	0.17	0.52	**0.72**	0.27	0.19	0.03	0.20	0.20	0.05	0.24	0.22	0.24	0.30	0.09	0.03	0.25	0.52	0.09	0.18	0.42	0.33	**0.57**
Policies of Ministry of Energy	0.53	0.32	0.34	0.51	0.35	0.37		0.82	0.18	0.20	0.20	0.32	0.35	0.43	0.38	0.29	0.52	**0.68**	0.27	0.22	0.27	0.26	0.30	0.15	0.28	0.27	0.28	0.48	0.31	-0.19	0.33	0.48	0.25	0.16	0.43	0.43	**0.62**
Strategy & Coordination	*0.71*	*0.40*	*0.51*	*0.69*	*0.61*	*0.79*	*0.82*		*0.23*	*0.38*	*0.33*	*0.43*	*0.54*	*0.59*	*0.48*	*0.28*	*0.63*	**0.88**	*0.35*	*0.27*	*0.23*	*0.31*	*0.34*	*0.15*	*0.31*	*0.27*	*0.33*	*0.49*	*0.27*	*-0.13*	*0.35*	*0.63*	*0.22*	*0.22*	*0.54*	*0.49*	**0.75**
Activities of Competitiveness Council	0.26	0.15	0.07	0.20	0.26	0.14	0.18	0.23		0.18	0.04	0.15	0.20	0.11	0.18	0.20	0.22	**0.12**	-0.01	0.05	0.23	0.06	0.18	0.21	0.07	0.18	0.11	0.21	0.16	-0.11	0.13	0.22	0.11	0.07	0.20	0.18	**0.28**
Activities of Investment Promotion Agency	0.37	0.39	0.47	0.52	0.33	0.38	0.20	0.28	0.18		0.30	0.24	0.71	0.45	0.23	-0.03	0.31	**0.54**	0.32	0.57	0.17	0.44	0.37	0.20	0.28	0.28	0.35	0.41	0.22	-0.02	0.40	0.59	0.20	0.28	0.53	0.53	**0.60**
Activities of Chambers of Commerce	0.29	0.46	0.20	0.39	0.26	0.32	0.20	0.23	0.04	0.30		0.25	0.66	0.25	0.30	0.12	0.30	**0.47**	0.01	0.25	0.13	0.31	0.20	0.16	0.19	0.21	0.12	0.25	0.20	-0.16	0.15	0.28	0.03	0.04	0.18	0.20	**0.37**
Activities of Stock Exchange	0.31	0.29	0.37	0.41	0.14	0.44	0.32	0.43	0.15	0.24	0.25		0.64	0.38	0.37	0.15	0.41	**0.54**	0.14	0.26	0.25	0.22	0.29	0.25	0.35	0.44	0.20	0.38	0.22	-0.06	0.33	0.57	0.11	0.15	0.42	0.44	**0.54**
Investment Promotion & Business Support	*0.49*	*0.52*	*0.45*	*0.61*	*0.39*	*0.51*	*0.35*	*0.54*	*0.50*	*0.71*	*0.66*	*0.64*		*0.48*	*0.43*	*0.17*	*0.50*	**0.75**	*0.19*	*0.46*	*0.30*	*0.34*	*0.42*	*0.32*	*0.35*	*0.48*	*0.32*	*0.50*	*0.32*	*-0.14*	*0.40*	*0.66*	*0.18*	*0.22*	*0.53*	*0.54*	**0.71**
Activities of Civil Society	0.53	0.42	0.60	0.66	0.32	0.54	0.43	0.59	0.11	0.45	0.25	0.38	0.48		0.34	0.24	0.77	**0.75**	0.25	0.40	0.15	0.29	0.37	0.21	0.42	0.29	0.25	0.38	0.28	-0.02	0.38	0.62	0.16	0.24	0.50	0.48	**0.69**
Activities of Consumer Body	0.32	0.18	0.32	0.25	0.26	0.41	0.38	0.48	0.18	0.23	0.30	0.37	0.43	0.34		0.20	0.65	**0.57**	0.10	0.15	0.23	0.10	0.16	0.18	0.23	0.26	0.02	0.20	0.16	-0.07	0.13	0.42	0.07	0.13	0.31	0.26	**0.45**
Uptake of Green Standards	0.35	0.18	0.18	0.21	0.14	0.17	0.29	0.28	0.20	-0.03	0.12	0.15	0.17	0.24	0.20		0.70	**0.45**	-0.03	-0.05	0.21	-0.06	0.30	0.30	0.07	0.26	-0.13	0.27	0.32	0.08	0.33	0.17	0.09	0.15	0.19	0.21	**0.37**
Citizen Engagement	*0.57*	*0.28*	*0.53*	*0.63*	*0.34*	*0.52*	*0.52*	*0.63*	*0.22*	*0.31*	*0.30*	*0.41*	*0.50*	*0.77*	*0.65*	*0.70*		**0.83**	*0.16*	*0.24*	*0.27*	*0.16*	*0.40*	*0.23*	*0.34*	*0.44*	*0.08*	*0.41*	*0.36*	*0.00*	*0.41*	*0.57*	*0.15*	*0.25*	*0.48*	*0.46*	**0.72**
Climate AccountAbility Index	**0.78**	**0.61**	**0.69**	**0.88**	**0.57**	**0.72**	**0.68**	**0.88**	**0.32**	**0.54**	**0.47**	**0.54**	**0.75**	**0.75**	**0.57**	**0.45**	**0.83**		**0.31**	**0.39**	**0.31**	**0.34**	**0.45**	**0.30**	**0.38**	**0.49**	**0.31**	**0.53**	**0.35**	**-0.10**	**0.45**	**0.76**	**0.20**	**0.28**	**0.63**	**0.59**	**0.87**
Super gasoline prices at the pump US$/l (GTZ Nov 2008)	0.19	0.23	0.32	0.21	0.24	0.27	0.27	0.25	-0.01	0.32	0.01	0.14	0.19	0.25	0.10	-0.03	0.16	**0.31**		0.33	0.27	0.86	0.46	0.35	0.24	0.41	0.34	0.30	-0.01	0.23	0.34	0.41	0.33	0.48	0.59	0.67	**0.57**
Cost of water [$/m3, GWI/OECD 2008]	0.20	0.34	0.41	0.40	0.21	0.19	0.22	0.27	0.05	0.57	0.25	0.26	0.46	0.40	0.15	-0.05	0.24	**0.39**	0.33		0.23	0.67	0.27	0.11	0.34	0.40	0.38	0.52	0.26	-0.07	0.45	0.60	0.32	0.21	0.52	0.62	**0.57**
Cost of electricity to industry [US EIA, 2007 or MRY]	0.11	0.23	0.29	0.26	0.27	0.03	0.27	0.23	0.23	0.17	0.13	0.25	0.30	0.15	0.23	0.21	0.27	**0.31**	0.27	0.23		0.48	0.28	0.34	0.23	0.45	0.09	0.38	0.37	-0.08	0.34	0.43	0.08	0.21	0.38	0.51	**0.47**
Incentives: price signals (gasoline, water, electricity)	*0.16*	*0.21*	*0.38*	*0.25*	*0.28*	*0.20*	*0.26*	*0.21*	*0.06*	*0.44*	*0.11*	*0.22*	*0.34*	*0.29*	*0.10*	*-0.06*	*0.16*	**0.34**	*0.86*	*0.67*	*0.48*		*0.42*	*0.21*	*0.30*	*0.47*	*0.36*	*0.45*	*0.13*	*0.10*	*0.41*	*0.52*	*0.36*	*0.42*	*0.63*	*0.77*	**0.64**
Know something/a great deal about climate change (Gallup 2007/08)	0.27	0.33	0.32	0.39	0.29	0.20	0.30	0.34	0.18	0.37	0.20	0.29	0.42	0.37	0.16	0.30	0.40	**0.45**	0.46	0.27	0.28	0.42		0.87	0.26	0.69	0.19	0.55	0.45	-0.10	0.49	0.50	0.44	0.47	0.62	0.69	**0.67**
Global warming a serious personal threat(Gallup 2007/08)	0.07	0.25	0.25	0.23	0.18	0.05	0.15	0.15	0.21	0.20	0.16	0.25	0.32	0.21	0.18	0.30	0.33	**0.30**	0.35	0.11	0.34	0.21	0.87		0.16	0.64	0.02	0.43	0.33	-0.01	0.36	0.33	0.23	0.48	0.49	0.57	**0.52**
Property Insurance penetration [Swiss Re, 2007]	0.16	0.27	0.26	0.29	0.14	0.24	0.28	0.21	0.07	0.28	0.19	0.35	0.35	0.42	0.23	0.07	0.34	**0.38**	0.24	0.34	0.23	0.30	0.26	0.16		0.75	0.23	0.31	0.36	-0.07	0.42	0.48	0.29	0.00	0.34	0.57	**0.53**
Awareness & preparedness	*0.21*	*0.34*	*0.37*	*0.28*	*0.26*	*0.22*	*0.37*	*0.27*	*0.18*	*0.28*	*0.21*	*0.44*	*0.48*	*0.29*	*0.26*	*0.26*	*0.44*	**0.49**	*0.41*	*0.40*	*0.45*	*0.47*	*0.69*	*0.64*	*0.75*		*0.26*	*0.60*	*0.55*	*-0.06*	*0.64*	*0.61*	*0.40*	*0.26*	*0.63*	*0.85*	**0.76**
Electricity distribution efficiency (IEA 2007)	0.33	0.25	0.22	0.34	0.22	0.24	0.28	0.23	0.11	0.35	0.12	0.20	0.32	0.25	0.02	-0.13	0.08	**0.31**	0.34	0.38	0.09	0.26	0.19	0.02	0.23	0.26		0.38	0.10	-0.15	0.42	0.40	0.17	-0.01	0.29	0.39	**0.37**
Quality of electricity supply (WEF 2.07, 2009/10)	0.33	0.33	0.32	0.41	0.28	0.30	0.48	0.49	0.21	0.41	0.25	0.38	0.50	0.38	0.20	0.27	0.41	**0.53**	0.30	0.52	0.38	0.45	0.55	0.43	0.31	0.60	0.38		0.57	-0.14	0.70	0.61	0.35	0.32	0.59	0.70	**0.70**
Access to electricity (IEA electricity access database 2008)	0.13	0.20	0.27	0.25	0.22	0.09	0.31	0.27	0.16	0.22	0.20	0.22	0.32	0.28	0.16	0.32	0.36	**0.35**	-0.01	0.26	0.37	0.13	0.45	0.33	0.36	0.55	0.10	0.57		-0.49	0.59	0.35	0.46	0.08	0.33	0.47	**0.47**
Renewables as % of total electricity generated (IEA database 2008/07)	-0.14	-0.14	0.05	-0.09	-0.15	0.03	-0.19	-0.13	-0.11	-0.02	-0.16	-0.06	-0.14	-0.02	-0.07	0.08	0.00	**-0.10**	0.23	-0.07	-0.08	0.10	-0.10	-0.01	-0.07	-0.06	-0.15	-0.14	-0.49		0.24	-0.07	-0.18	0.26	0.09	0.09	**0.00**
Access to clean electricity	*0.22*	*0.24*	*0.41*	*0.27*	*0.19*	*0.25*	*0.33*	*0.25*	*0.13*	*0.40*	*0.15*	*0.23*	*0.40*	*0.28*	*0.13*	*0.23*	*0.41*	**0.45**	*0.34*	*0.45*	*0.34*	*0.41*	*0.49*	*0.26*	*0.42*	*0.64*	*0.42*	*0.70*	*0.59*	*0.24*		*0.56*	*0.38*	*0.20*	*0.58*	*0.77*	**0.68**
CO2 emissions trend of the largest 5 companies score (AA)	0.51	0.54	0.65	0.71	0.41	0.52	0.48	0.63	0.22	0.59	0.28	0.57	0.66	0.62	0.42	0.17	0.57	**0.76**	0.41	0.60	0.43	0.52	0.50	0.33	0.48	0.61	0.40	0.61	0.35	-0.07	0.56		0.30	0.32	0.81	0.77	**0.85**
Emissions intensity trend CO2/GDP PPP 1990-2007 (IEA 2009)	0.03	0.17	0.10	0.12	0.17	0.09	0.25	0.22	0.11	0.20	0.03	0.11	0.18	0.16	0.07	0.09	0.15	**0.20**	0.33	0.32	0.08	*0.36*	0.44	0.23	0.29	0.40	0.17	0.35	0.46	-0.18	0.38	0.30		0.19	*0.54*	0.52	**0.40**
CO2 emissions per $1000 GDP in manufacturing & construction	0.14	0.18	0.31	*0.26*	0.19	0.18	0.16	0.22	0.07	0.28	0.04	0.15	0.22	0.24	0.13	0.15	*0.25*	**0.28**	0.48	0.21	0.21	*0.42*	0.47	0.48	0.00	0.26	-0.01	0.32	0.08	0.26	0.30	0.32	0.19		0.74	0.58	**0.50**
Intensity & trends	*0.37*	*0.44*	*0.54*	*0.57*	*0.39*	*0.42*	*0.43*	*0.54*	*0.20*	*0.53*	*0.18*	*0.42*	*0.53*	*0.50*	*0.31*	*0.19*	*0.48*	**0.63**	*0.59*	*0.52*	*0.38*	*0.63*	*0.62*	*0.49*	*0.34*	*0.63*	*0.29*	*0.59*	*0.33*	*0.09*	*0.58*	*0.81*	*0.54*	*0.74*		*0.88*	**0.85**
Climate performance index	*0.30*	*0.41*	*0.52*	*0.52*	*0.35*	*0.33*	*0.43*	*0.49*	*0.18*	*0.53*	*0.20*	*0.44*	*0.54*	*0.48*	*0.26*	*0.21*	*0.46*	**0.59**	*0.67*	*0.62*	*0.51*	*0.77*	*0.69*	*0.57*	*0.57*	*0.85*	*0.39*	*0.70*	*0.47*	*0.09*	*0.77*	*0.77*	*0.52*	*0.58*	*0.88*		**0.90**
Overall score	**0.59**	**0.56**	**0.67**	**0.77**	**0.51**	**0.57**	**0.62**	**0.75**	**0.28**	**0.60**	**0.37**	**0.54**	**0.71**	**0.69**	**0.45**	**0.37**	**0.72**	**0.87**	**0.57**	**0.57**	**0.47**	**0.64**	**0.67**	**0.52**	**0.53**	**0.76**	**0.37**	**0.70**	**0.47**	**0.00**	**0.68**	**0.85**	**0.40**	**0.50**	**0.85**	**0.90**	