

Environmental
Rating
Agency

G20 Report
AAA–DDD ratings
for National
Environmental
Performance



ERA

Executive Summary

This report applies the AAA-style ratings traditionally used to assess the credit worthiness of countries to rank the world's G20 nations according to their relative environmental performance.

The 12 environmental indicators included in this report offer a combination of good quality data, environmental insights and comparability across the G20.

For each environmental indicator, the country with the best environmental performance has been awarded an AAA-rating. Other countries have then been downgraded one rating for every 5% drop in performance, with the worst receiving a DDD rating.

Averaging the environmental performance of each country, across the 12 indicators, has enabled us to produce a G20 "league table". The detailed results for the individual indicators can be found in Appendix 1 and helpful national "report cards" can be found in Appendix 2.

Germany has come top of the G20 "league table" with a mean rating of A+, which is only the 5th best rating that is theoretically possible. This modest result demonstrates that every single country, including Germany, could improve its environmental performance by adopting the best practices of other G20 nations.

In second place, the UK has also emerged as a consistent, if mediocre "plodder", which is quite good across the majority of environmental indicators. By comparison, middle-ranking Australia is hugely erratic with good ratings for corruption and wildlife conservation, but very bad ratings for its electricity generation and high CO2 emissions per capita.

Japan and South Korea stand out as the two rich countries that are under-performing the most, in comparison to their G20 peers, with poor to bad ratings for several indicators each. Surprisingly, the US rates rather well, overall, despite its well known under-performance in relation to CO2 emissions and energy use.

Of the poorer nations, both South Africa and China have only a couple of very bad ratings. As a result, these countries have the potential to perform well over the years ahead. By comparison, it is obvious that India is wrestling with a number of severe environmental problems and struggling to cope with most of them.

Despite its vast oil wealth, Saudi Arabia has come bottom in the G20 league table. It has extremely bad DDD-ratings for its removal of water and air quality, and very low C-ratings for CO2 emissions per capita, terrestrial protected areas and marine protected areas. These very poor results demonstrate that there is much more to achieving good or bad environmental performance than spending money.

Executive Summary continued

Overall, this report finds that many countries including Brazil, Russia, Indonesia, India, China, Argentina, Turkey, Saudi Arabia, South Korea, Japan and the UK could significantly boost their environmental performance by increasing the size of their terrestrial and/or marine protected areas. Countries such as Australia, the US, Saudi Arabia and Canada could also benefit a great deal by using less polluting fuels to make electricity and using resources more efficiently.

Collectively, the G20's 19 member countries and the European Union represent 90% of global GDP, approximately 80% of anthropogenic carbon emissions, over 65% of the world's population and roughly 50% of all tropical deforestation.

The environmental impacts of this small group of nations are clearly massive and the benefits of spreading best practice throughout the G20 could be similarly large.

We hope that this initial attempt to rate the environmental performance of the G20 nations will prove useful, and help anyone wanting to compare how well these important countries are doing at protecting their, and our, environment and economy from avoidable risks and harm.

Ratings Scale

1	0.95-1.00	AAA
2	0.90-0.95	AA+
3	0.85-0.90	AA
4	0.80-0.85	AA-
5	0.75-0.80	A+
6	0.70-0.75	A
7	0.65-0.70	A-
8	0.60-0.65	BBB+
9	0.55-0.60	BBB
10	0.50-0.55	BBB-
11	0.45-0.50	BB+
12	0.40-0.45	BB
13	0.35-0.40	BB-
14	0.30-0.35	B+
15	0.25-0.30	B
16	0.20-0.25	B-
17	0.15-0.20	CCC
18	0.10-0.15	CC
19	0.05-0.10	C
20	0.00-0.05	DDD

Environmental Ratings for the G20 nations

Environmental Ratings for the G20 nations

This report applies the AAA-style ratings traditionally used to assess the credit worthiness of countries to rank the world's G20 nations according to their relative environmental performance.

Why the G20 nations?

Collectively, the G20's 19 member countries and the European Union represent 90% of global GDP, approximately 80% of anthropogenic carbon emissions, over 65% of the world's population and roughly 50% of all tropical deforestation.

This report compares the environmental performance of the 19 individual member countries that are emerging as the world's economic super-powers. The combined environmental impacts of these nations are enormous, but rarely compared and contrasted.

The AAA to DDD rating scale

Our environmental ratings are designed to stimulate a debate about where countries are succeeding and failing in comparison to their G20 peers. We have adapted the AAA-style rating systems, traditionally used to compare national economic performance to compare national environmental performances.

For each environmental indicator, the best performing nations have been used to calibrate the relative environmental performance of other G20 nations. The best receive an AAA rating and countries are downgraded one rating for every 5% decline in performance, with the worst receiving a DDD rating.

Rating Grades (1 = AAA / 0 = DDD)

The country with the best environmental performance, for each of 12 environmental indicators selected for this study, has been used to set the grading scale used for each indicator.

For each indicator, the raw data found in the literature, has been converted to give the best score a notional value of 1 and the worst score a value as low as zero.

Outliers and Exceptions

In a small number of indicators, extreme outliers in the data that could distort the rating scale have been omitted.

An example of such an outlier is Saudi Arabia, which extracts 943% of the nation's annual renewable water supply. In this case, the next worst performing nation, which extracts 39% of its annual renewable water supply, has been used to define a DDD rating and Saudi Arabia has been given the same DDD rating.

In other instances, such as the energy efficiency of thermal plants in power stations, the limitations of the available technology have been taken into account and the grading scale adjusted to lessen the impact of a poor rating.

The selection of environmental indicators

The selection of environmental indicators

Approximately 30 different environmental indicators were considered for inclusion in this assessment. However, due to the lack of adequate and robust international data it has been decided to rely on the 12 environmental indicators that offered the best combination of environmental insights and high quality data.

The environmental indicators used to assess the relative performance of countries include the following: economic efficiency, energy efficiency, infrastructure investment, atmospheric emissions, environmental protection, land management, water resource use, corruption, social development, threats to endemic mammals, birds and amphibians, marine protected areas and air particulates.

Gaps in indicator data

Indicators that we would have liked to include in this assessment, but which lacked adequate data, included water quality, municipal and household waste, recycling and pesticide consumption. These and other gaps in the available data mean that many countries are currently running unknown and potentially extremely serious risks with their human, economic and environmental health.

Future ratings of environmental performance will be less forgiving of countries that fail to publish basic, up-to-date environmental data via appropriate international agencies or initiatives. Where there are no good reasons, non-reporting nations will be given automatic DDD ratings in future assessments.

Calculating Mean National Ratings

The national ratings for each individual indicator have been aggregated and used to calculate a national mean rating, based on all 12 indicators, using the following formula:

$$(\text{var 1} + \text{var 2} + \text{var 3} + \text{var 4} + \text{var 5} + \text{var 6} + \text{var 7} + \text{var 8} + \text{var 9} + \text{var 10} + \text{var 11} + \text{var 12}) / 12$$

These mean national environmental ratings have been used to form the basis of a G20 “league table” which compares the overall environmental performance of all the nations highlighted in this study.

National Report Cards and Indicators

The national ratings for each of the 12 indicators, used to calculate the mean national ratings, have been included in Appendix 1 and summarised in “national report cards” in Appendix 2.

Downgrades

For each indicator, every 0.05 index unit (5%) drop in environmental performance, relative to the best levels achieved by any G20 nation, results in a country being downgraded one notch, i.e. one grade.

Theoretically, this means that 20 grades separate the top AAA rating from the bottom DDD rating; although the full range of grades are not always observed.

Investment Grade (AAA – BBB-)

In order to achieve a top AAA environmental rating for a given indicator, a country needs to achieve a level of environmental performance within 0.05 index units (5%) of the best levels achieved by any G20 nation.

An AAA rating matters in traditional economic ratings because only countries achieving AAA – BBB- ratings are considered to be “investment grade” by the most risk-averse investors, such as pension funds.

Today, the AAA environmental ratings highlighted by this report will not have any investment implications. However, it is possible that this situation might alter; as our perceptions of the financial implications of crossing planetary boundaries and failing to manage environmental risk change over time.

“Junk” status (BB+ to C)

In traditional economics, a series of rating downgrades means that a country risks being seen as a risky or speculative place to invest. If no action is taken to improve a country’s rating it may eventually slip to “junk” status, once its rating grades falls below BBB-.

All of the “junk” environmental ratings featured in this report, including all of the grades between BB+ and C grades, provide a clear warning that remedial

action is required, if environmental harm is to be avoided or reduced. In the future, if environmental costs start to be comprehensively included in prices, “junk” environmental ratings could start have serious political and financial implications, and begin to provide new incentives for action.

Environmental “Default” (DDD)

When a country severely mishandles its economic affairs and disastrously erodes its capital base, it may stop being able to meet its basic financial obligations and “default” on its commitments. After this happens investors are usually frightened away and the country’s economy collapses.

Under such conditions a country is given the lowest rating possible, equivalent to a DDD rating. An economic “default” frequently results in the country being declared bankrupt as well as governments being considered unfit to hold office by voters and unreliable to invest in by investors.

A similar environmental “default”, occurs where a country no longer has the natural capital required to meets its social and environmental obligations and/or risks severely, and perhaps permanently, harming ecosystem services.

An environmental “default” involving the extinction of key species, destruction of habitats or severe contamination of food, air or water supplies could be at least as serious as an economic “default”. It is therefore advisable for countries to take any poor environmental ratings, especially DDD ratings, as a strong warning that unsustainable environmental risks are being taken and urgent action is required.

Mean Environmental Rating by Country / G20 League Table

Overall National Environmental Performance Rating

Rank	Country	Indicator	Rating
1	Germany	0.7750	A+
2	United Kingdom	0.7334	A
3	France	0.6950	A-
4	United States	0.6539	A-
5	Canada	0.6453	BBB+
6	Brazil	0.6439	BBB+
7	Japan	0.6219	BBB+
8	Italy	0.6199	BBB+
9	Australia	0.5953	BBB
10	Argentina	0.5875	BBB
11	Mexico	0.5537	BBB
12	Turkey	0.5446	BBB-
13	South Korea	0.5434	BBB-
14	Indonesia	0.5338	BBB-
15	Russia	0.5173	BBB-
16	China	0.5018	BBB-
17	South Africa	0.4306	BB
18	India	0.3621	BB-
19	Saudi Arabia	0.3536	BB-

The “league table” (above) shows the mean environmental rating and overall rank achieved by each G20 country, based on 12 different environmental indicators.

The national ratings achieved within each of the 12 environmental indicators are included in Appendix 1 and summarised as “national report cards” in Appendix 2.

Conclusions

G20 Environmental Rating “League Table”

Based on the mean environmental rating of each country, across our basket of environmental indicators, no country has achieved an overall rating of AAA.

This finding indicates that even the best-rated countries have considerable scope for improving multiple aspects of their environmental performance, when compared to other G20 nations.

Germany came top of our overall “league table”, but still only achieved a mean rating of an A+, which equates to the 5th best rating that is theoretical possible.

Given that the top ratings for all of the individual indicators were based on the best environmental performance seen within the G20 nations, it should be possible for all of the member nations to significantly improve their overall rating by adopting G20 best practice.

In particular, the individual environmental indicators that let down countries the most should offer some useful clues as to the areas that would benefit the most from additional effort and investment (see Appendix 2).

It is interesting that Saudi Arabia has the worst overall environmental performance within the G20, despite its immense wealth. This suggests that financial resources alone are not enough to solve the problems associated with poor environmental performance.

More positively, Saudi Arabia is much better placed than poorer members of the G20 to invest in improving its environmental protection. With Saudi Arabia’s “national report card” indicating that efforts to improve air quality and the conservation of water supplies would be particularly worthwhile.

The highest-ranking nations in the “league table”, such as German, UK, France and the US tend to be mediocre “plodders” when it comes to their environmental performance. They rarely score highly in individual environmental indicators but also avoid having many very low ratings (see Appendix 2).

The middle-ranking nations either tend to be highly variable in their environmental performance, e.g. Australia, or consistently average to poor in their environment stewardship, e.g. Italy and Mexico.

The lowest performing nations tend to rate extremely badly according to 2 – 3 + ratings and to be poor across a broad sweep of environmental indicators, with only a very small number of redeeming environmental strengths, e.g. India, Russia and Saudi Arabia. It is likely that these low-ranking countries would benefit the most from significantly upgrading their physical infrastructure and adopting new technical or policy standards.

More generally, it is apparent that every country could benefit from introducing better environmental management and enhanced resource efficiency strategies into their plans for future economic development.

Ratings by Indicator

The tables summarising the environmental performance of all G20 nations within each indicator reveal how difficult it is to predict the performance of any given nation (see Appendix 1, pages 14 - 25).

The variability witnessed within indicators suggests that the relative success or failure of many nations depends on subjective or opportunistic political decisions, which can go one way under certain conditions and the opposite direction under different conditions.

On this basis, many countries could dramatically improve their overall rating by trying to match the environmental performance of their peers and learning from their experiences.

In most cases, it appears that ambitious countries do not need to wait for new technologies to be invented. They simply need to make better use of existing technologies and to take a fresh look at the policies that have successfully delivered beneficial change elsewhere.

Many developed countries seem to prefer trying to “re-invent the wheel”, and failing to protect their environment, than admitting that others might have more effective ideas, which could be copied and adopted.

Poorer countries more obviously lack the resources required to improve their environmental performance and would appear to need far more financial, technical and policy assistance than is currently available.

Although terrestrial and marine protected areas have not been fashionable for a long time, these two indicators stand out as the ones where many G20 countries have received their lowest ratings and could do better.

In terms of terrestrial protected areas Argentina (1.7%), Brazil (4.2%), India (4.8%), Mexico (2.4%), Russia (3.1%), Saudi Arabia (2.3%), South Korea (2.4%) and Turkey (0.4%) rate very badly (CCC – DDD) and have fallen a long way behind the best, Germany (27%).

Even more countries have very poor coverage in terms of marine protected areas. For example, Argentina (1.1%), Canada (1.2%), China (1.3%), India (1.7%), Indonesia (2%), Japan (5.5%), Saudi Arabia (3.4%), South Africa (6.5%), South Korea (3.9%), Turkey (2.4%) and the UK (5.7%) all have considerable room for improvement.

Interestingly, when it comes to establishing marine protected areas countries such as the US and Australia are amongst the countries that set the benchmark for what is possible, with over 25% of their marine territories granted protected area status.

National Report Cards

National report cards

The ratings achieved by each country have been summarised below to produce national “report cards”. These “report cards” reveal the difficulties associated with achieving consistently high environmental ratings (Appendix 2, pages 26 - 44).

Even the top ranking nations, such as Germany and the UK, are patchy in their environmental performance.

The secret to their success seems to be that they have undertaken a combination of slow, steady and painful work and sustained efforts to monitor, report and improved their environmental performance over the long-term.

In Germany, the heavy dependence on coal to make electricity and the high CO₂ emissions per capita mean that there are relatively few “quick wins” left. Future gains will almost certainly require high levels of personal consumption to be addressed and even more renewable / efficient technologies being installed than have already been deployed.

The UK faces very similar issues to Germany, but also lets itself down by having such small marine protected areas.

Some of the national “report card” results are far from obvious and it deserves to be said that the US does better overall than critics might expect, despite its well known under-performance in relation to CO₂ emissions and energy efficiency.

Data collection and reporting

After sifting through a large quantity of international environmental data, the countries of the EU are the ones that stand out as offering the most impressive range of standardised and comparable data for many different environmental indicators.

The Environmental Rating Agency would like to encourage other countries to harmonise and expand their collection and reporting of basic environmental data in standardised forms. At present, it is clear that many countries are not publishing data or, even worse, not collecting essential data.

Considering the substantial amounts of remote-sensing data collected at vast expense, via satellites, it is truly remarkable how little effort and resources go into the collection of far more basic and internationally useful data. For example, there are currently very few internationally comparable, low-tech datasets available for vital environmental indicators such as water quality or heavy metal pollution.

Our growing reliance on satellites for international environmental data has certain advantages. However, this trend seems to mean that we are also missing out on a number of low-tech opportunities to improve environmental reporting on the ground: quickly, simply and cost effectively.

The value of environmental ratings

Excluded indicators

Certain potential indicators of national environmental performance, such as fisheries management and nuclear waste liabilities, have not been included in this initial assessment as they do not apply to all of the G20 nations.

Future assessments will endeavour to include a broader portfolio of indicators and to cope more satisfactorily with the total presence or absence of particular indicators from a high proportion of countries.

We fully accept that the exclusion of such indicators is a weakness of this report and would like to ask for help with identifying additional sources of good quality and up-to-date data, so that we can broaden the range of indicators included in future assessments.

Sub-national and regional indicators

We also accept that large countries, such as China, are geographically vast and both biologically and socially diverse.

Inevitably, a huge amount of natural and human-induced variability can occur within such countries and it has not been possible to assess all of this variability within this report.

Provided that adequate data becomes available, future assessments will attempt to capture and analyse the levels of local and regional variation that occur within nations.

As things stand, this report can only attempt to offer an initial comparison of the environmental performance of countries in very broad terms.

It is possible that future ratings will be able to provide state-by-state or province-by-province ratings within each country, and to assess different environmental sectors around the world. This scalable approach should help countries to improve within their own borders and to iron out domestic issues that are currently pulling down their national rating.

The value of environmental ratings

Institutions such as Yale University and the Organisation for Economic Co-Operation and Development (OECD) have proposed a variety of different international environmental indicators, but to our knowledge, this is the first time that environmental indicators have been combined to rate the overall environmental performance of the G20 nations.

The finance industry has used similar techniques to rate the economic performance of nations for many years. It is therefore hoped that this environmental rating assessment will complement more traditional economic rating systems and help to expose some of the environmental, and economic, risks associated with living in and/or investing in different countries.

Despite being largely ignored today, it is conceivable that the environmental performance of nations will one day be used to identify the countries that are good, bad or great at addressing a broader range of fundamental risks to their economies.

Every nation's economy is embedded within its environment and our new environment ratings could provide a useful tool for investors seeking to reduce their exposure to both short and long-term risks.

Future ratings

Over time, additional countries, regions, indicators and sectors will hopefully receive environmental ratings as this initiative is enhanced and expanded. Our international environmental rating system has adapted an approach that has proven to be popular when it comes to assessing economic performance, and we believe that approach has the potential to help improve environmental performance.

Hopefully it has offered some food for thought and will help to stimulate the new collaborations and international efforts needed to focus scarce resources and deliver better outcomes.

In the future, it may be possible for us to provide real-time ratings of the environmental performance of governments at home (e.g. during environmental crises) and abroad (e.g. during Earth Summits or G20 negotiations).

Next steps

As history has shown, civilisations can seriously and permanently damage their natural environment and it is hoped that countries will strive to act upon the warnings provided by the “junk” and “default” ratings included in this report.

By helping countries to focus effort and investment where it is most needed, our AAA-style environmental ratings should assist countries in their efforts to identify the most urgent areas for action. Potentially, they could also help governments to identify the best sources of assistance and advice from within the G20.

A well-publicised, international environment performance rating will hopefully put pressure on, and encourage, those countries with the lowest ratings to address their environmental issues. This will have benefits beyond the borders of individual G20 countries. In this way, an AAA-style environment rating system has the potential to act as a mechanism for global environmental improvement.

We will continue to update our AAA – DDD environmental ratings as new and better data become available. In the meantime, we hope that the citizens and policy makers of the G20 will find our first attempt at rating their country’s relative environmental performance of interest and value.

If you would like to work with us, please contact us and share your thoughts.

Dr Matt Prescott
June 2012

Appendix 1: Results by Indicator

1. Energy per unit 2000PPP\$ (2008)

Country	GDP per unit of energy (2000PPP\$/kg oil eq)	Index	Rating
United Kingdom	9.9	1.0000	AAA
Italy	9.7	0.9798	AAA
Turkey	8.9	0.8990	AA
Germany	8.3	0.8384	AA
Japan	8.1	0.8182	AA
Mexico	7.9	0.7980	A+
Brazil	7.4	0.7475	A
France	7.3	0.7374	A
Argentina	6.9	0.6970	A
United States	5.8	0.5859	BBB
Australia	5.7	0.5758	BBB
South Korea	5.5	0.5556	BBB
India	5.1	0.5152	BBB
Canada	4.5	0.4545	BB+
Indonesia	4.4	0.4444	BB
China	3.6	0.3636	BB
Saudi Arabia	3.5	0.3535	BB
South Africa	3.1	0.3131	B+
Russia	3.0	0.3030	B+

SOURCE:
<http://data.worldbank.org/indicator/EG.GDP.PUSE.K0.PP.KD/countries>

This indicator compares the level of economic return achieved (2000\$PPP) per unit of energy (kg oil equivalent), and is used as a proxy for economic efficiency. More up-to-date data is not available for all of the G20 countries.

The countries best able to convert a unit of energy into an economic benefit achieved the highest ratings, whilst the countries able to extract smallest economic benefit from each unit of energy have been awarded the lowest ratings.

WORLD BANK DEFINITION: GDP per unit of energy use is the PPP GDP per kilogram of oil equivalent of energy use. PPP GDP is gross domestic product converted to 2000 constant international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as a U.S. dollar has in the United States.

Appendix 1: Results by Indicator

2. Thermal Power Plant Efficiency

Country	Thermal Power Plant %	Index	Rating
Japan	44	1.0000	AAA
United Kingdom	44	1.0000	AAA
Turkey	43	0.9773	AAA
Brazil	42	0.9545	AAA
Canada	42	0.9545	AAA
Italy	42	0.9545	AAA
Mexico	42	0.9545	AAA
Argentina	41	0.9318	AA+
South Korea	40	0.9091	AA+
United States	39	0.8864	AA
South Africa	38	0.8636	AA
Germany	37	0.8409	AA
Indonesia	35	0.7955	A+
Australia	33	0.7500	A+
France	33	0.7500	A+
China	32	0.7273	A
Saudi Arabia	31	0.7045	A
India	27	0.6136	BBB+
Russia	26	0.5909	BBB

SOURCE:

<http://www.abb.com/cawp/db0003db002698/6cc1f7ff2eff1660c12579ba004b64ef.aspx>

In order to compare the level of long-term effort and investment committed by each of the G20 nations to delivering energy efficiency this project has used data publicly published by ABB on the energy efficiency of thermal power plant.

This data is taken as a proxy for wider, national trends in energy efficiency.

ABB's "Trends in global energy efficiency 2011" is based on data and information provided by Enerdata and the Economist Intelligence Unit.

Fair use has been made of ABB's data to generate a new index and rating scale.

Appendix 1: Results by Indicator

3. CO2 per kWh generated

Country	CO2 per kWh generated gCO2/kWh	Index	Rating
Brazil	56	1.0000	AAA
France	83	0.9702	AAA
Canada	181	0.8622	AA
Russia	341	0.6858	A
Argentina	349	0.6770	A
Italy	375	0.6483	BBB+
Germany	433	0.5843	BBB
United Kingdom	435	0.5821	BBB
Japan	438	0.5788	BBB
Mexico	477	0.5358	BBB
South Korea	489	0.5226	BBB
Turkey	490	0.5215	BBB
United States	508	0.5017	BBB
Indonesia	715	0.2734	B
Saudi Arabia	752	0.2326	B
South Africa	817	0.1610	CCC
China	842	0.1334	CC
Australia	928	0.0386	DDD
India	963	0.0000	DDD

SOURCE:

<http://www.abb.com/cawp/db0003db002698/6cc1f7ff2eff1660c12579ba004b64ef.aspx>

This table compares the grammes of CO2 emitted per kWh. Brazil achieves very low emissions due to a heavy reliance on hydro-electric dams whilst France achieves almost as low emissions per kWh due to its use of nuclear power plants.

It has not been possible to adequately capture the varied environmental problems associated with all methods of making electricity and this weakness will need to be addressed in subsequent assessments. The higher emissions per kWh recorded by most countries reflect a greater reliance on fossil fuels such as coal and/or old plant.

ABB's "Trends in global energy efficiency 2011" has been used as the source for the above emission calculations. ABB's report is based on data and information provided by Enerdata and the Economist Intelligence Unit.

Fair use has been made of ABB's data to generate a new index and rating scale.

Appendix 1: Results by Indicator

4. CO2 emissions per capita (2008)

Country	CO2 per capita (2008)	Index	Rating
India	1.4	0.9259	AA+
Indonesia	1.8	0.9048	AA+
Brazil	1.9	0.8995	AA
Turkey	4	0.7884	A+
Mexico	4.4	0.7672	A+
Argentina	4.8	0.7460	A
China	5.3	0.7196	A
France	6.1	0.6772	A
Italy	7.5	0.6032	BBB+
United Kingdom	8.5	0.5503	BBB
South Africa	8.8	0.5344	BBB
Japan	9.5	0.4974	BB+
Germany	9.6	0.4921	BB+
South Korea	10.6	0.4392	BB
Russia	12.1	0.3598	BB
Canada	16.4	0.1323	CC
Saudi Arabia	17.2	0.0899	C
United States	17.5	0.0741	C
Australia	18.9	0.0000	DDD

SOURCE:
http://en.wikipedia.org/wiki/List_of_countries_by_carbon_dioxide_emissions_per_capita

This table summarises the carbon dioxide emissions per capita associated with each G20 nation in 2008.

The data only considers carbon dioxide emissions from the burning of fossil fuels and cement manufacture, but not emissions from land use such as deforestation.

All data were calculated by the US Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC), mostly based on data collected from country agencies by the United Nations Statistics Division <http://unstats.un.org/unsd/default.htm>.

Countries have been ranked according to their metric tonnes of carbon dioxide emissions per capita in 2008.

The carbon dioxide emissions of a country are only an indicator of one greenhouse gas.

For a more complete idea of how a country influences climate change, gases such as methane and nitrous oxide should be taken into account. This is particularly so in agricultural economies.

Appendix 1: Results by Indicator

5. National Protected Areas (hectares)

Country	Protected Areas % Land Area	Index	Rating
Germany	27	1.0000	AAA
United Kingdom	20.5	0.7593	A+
United States	13.4	0.4963	BB+
France	11.7	0.4333	BB
Canada	10	0.3704	BB
Indonesia	9.7	0.3593	BB
Italy	7.3	0.2704	B
Australia	7	0.2593	B
Japan	6.8	0.2519	B
China	6.4	0.2370	B
South Africa	5.4	0.2000	B
India	4.8	0.1778	CCC
Brazil	4.2	0.1556	CCC
Russia	3.1	0.1148	CC
Mexico	2.4	0.0889	C
South Korea	2.4	0.0889	C
Saudi Arabia	2.3	0.0852	C
Argentina	1.7	0.0630	C
Turkey	0.4	0.0148	DDD

SOURCE:
http://www.nationmaster.com/graph/env_pro_are-environment-protected-area

This table shows the percentage of each G20 country's land area that has been awarded national protected area status.

Countries that have been awarded the highest ratings have been rewarded for assigning formal protection to proportionately large areas of their land.

It should be noted that countries use different definitions for national parks and vary considerably in the level of protection actually afforded to protected areas at the state and national scales.

The data used in this comparison dates back to 1997 and will be updated as soon as more up-to-date data becomes available.

Appendix 1: Results by Indicator

6. Forest Annual Change Rate % (2005-2010)

Country	Forest Area x Deforestation Rate hectares x % rate	Index	Rating
China	274233100	1.0000	AAA
United States	121235600	0.6778	A
India	14217210	0.4524	BB+
Turkey	10989000	0.4456	BB
Italy	8781520	0.4410	BB
France	4666200	0.4323	BB
Japan	994720	0.4246	BB
United Kingdom	711250	0.4240	BB
Canada	0	0.4225	BB
Germany	0	0.4225	BB
Saudi Arabia	0	0.4225	BB
South Africa	0	0.4225	BB
South Korea*	-626500	0.4212	BB
Mexico	-15417120	0.3900	BB
Argentina	-26416800	0.3669	BB
Indonesia	-62831450	0.2902	B
Australia	-99843580	0.2122	B
Russia*	-129406400	0.1500	CCC
* estimated data used Brazil	-200633160	0.0000	DDD

SOURCE:
<http://rainforests.mongabay.com/deforestation/>

This table attempts to estimate the total amount of afforestation or deforestation seen in each G20 nation by multiplying the total area of forest in hectares by the annual percentage rate of change to create a new index.

China and the US are increasing forest coverage, but Russia and Brazil are experiencing continued deforestation.

Estimates in the rates of change seen in South Korea and Russia have been made following additional research.

Data has been derived from the Forest Resources Assessment and the State of the World's Forests published by the U.N. Food and Agriculture Organization (F.A.O)

Appendix 1: Results by Indicator

7. Water : % renewable resource removed

Country	Water % of renewable water resource removed	Index	Rating
Brazil	0.71	0.9822	AAA
Russia	1.47	0.9631	AAA
Canada	1.58	0.9603	AAA
Argentina	4.00	0.8995	AA+
Australia	4.58	0.8850	AA
Indonesia	5.61	0.8591	AA
United Kingdom	8.82	0.7785	A+
South Korea	11.22	0.7182	A
France	14.98	0.6238	BBB+
United States	15.57	0.6090	BBB+
Mexico	17.45	0.5618	BBB
Turkey	18.77	0.5286	BBB
China	19.51	0.5100	BBB
Japan	20.93	0.4744	BB+
Germany	20.97	0.4734	BB+
Italy	23.69	0.4051	BB
South Africa	24.53	0.3840	BB
India	39.82	0.0000	DDD
Saudi Arabia	943.30	0.0000	DDD

SOURCE:
http://www.unwater.org/statistics_KWIP.html

This table compares the percentage of renewable water resources used each year. The data for Saudi Arabia (943.30%) represents an extreme outlier and has not been used to calibrate the rating 0 – 1 scale. The data for India (39.82%) has been used to calibrate the high end of the water removal rating scale and Saudi Arabia has been given a default DDD for using such unsustainable levels of water removal.

FAO Indicator: Percent of freshwater resources withdrawn (%)

FAO Definition: Total freshwater withdrawn in a given year, expressed in percentage of the total actual renewable water resources (TARWR). This parameter is an indication of the pressure on the renewable water resources. Reporting Agency: FAO-AQUASTAT

FAO Calculation rule: $100 * \text{Total freshwater withdrawal (surface water + groundwater)} / \text{Water resources: total renewable (actual)}$

FAO Comments: The two variables considered for this indicator are highly aggregated, therefore, almost all methodological differences in underlying variables will repercute on this indicator. Most markedly, the treatment of outflows and return flows are not well agreed upon in the international community, and amongst countries. AQUASTAT, Eurostat, and UNSD values used for this indicator represent the Long-Term Annual Average (LTAA). The national data listed above was collected on different years between 2000 and 2010.

Appendix 1: Results by Indicator

8. Corruption Perceptions Index (2011)

Country	TI Corruption Index	Index	Rating
Australia	8.8	1.0000	AAA
Canada	8.7	0.9886	AAA
Germany	8	0.9091	AA+
Japan	8	0.9091	AA+
United Kingdom	7.8	0.8864	AA
United States	7.1	0.8068	AA-
France	7	0.7955	A+
South Korea	5.4	0.6136	BBB+
Saudi Arabia	4.4	0.5000	BBB
Turkey	4.2	0.4773	BB+
South Africa	4.1	0.4659	BB+
Italy	3.9	0.4432	BB
Brazil	3.8	0.4318	BB
China	3.6	0.4091	BB
India	3.1	0.3523	BB
Argentina	3	0.3409	B+
Indonesia	3	0.3409	B+
Mexico	3	0.3409	B+
Russia	2.4	0.2727	CCC

SOURCE:
<http://cpi.transparency.org/cpi2011/results/>

This table has used Transparency International's Corruption Perceptions Index as a proxy for the relative levels of corruption related to environmental protection.

It has been assumed that perceptions of corruption across nations are generally consistent and that the levels of corruption attributed to the wider society also apply to environmental protection.

It is possible that this assumption under-estimates the levels of corruption associated with environmental protection in different countries.

Transparency International's Corruption Perceptions Index ranks countries / territories based on how corrupt their public sector is perceived to be.

A country/territory's score indicates the perceived level of public sector corruption on a scale of 0 - 10, where 0 means that a country is perceived as highly corrupt and 10 means that a country is perceived as very clean. A country's rank indicates its position relative to the other countries/ territories included in the index.

Appendix 1: Results by Indicator

9. Human Development Index (2011)

Country	Human Development Index HDI	Index	Rating
Australia	0.929	0.9290	AA+
United States	0.91	0.9100	AA+
Canada	0.908	0.9080	AA+
Germany	0.905	0.9050	AA+
Japan	0.901	0.9010	AA+
South Korea	0.897	0.8970	AA
France	0.884	0.8840	AA
Italy	0.874	0.8740	AA
United Kingdom	0.863	0.8630	AA
Argentina	0.797	0.7970	A+
Mexico	0.77	0.7700	A+
Saudi Arabia	0.77	0.7700	A+
Russia	0.755	0.7550	A+
Brazil	0.718	0.7180	A
Turkey	0.699	0.6990	A
China	0.687	0.6870	A
South Africa	0.619	0.6190	BBB+
Indonesia	0.617	0.6170	BBB+
India	0.547	0.5470	BBB

SOURCE:
<http://hdr.undp.org/en/data/build/>

This table uses the UNDP's Human Development Index to encapsulate the capacity of nations to protect their environment, through a combination of sufficient wealth, good health and high quality education. The original human development data utilized in the preparation of the Human Development Index (HDI) and other composite indices featured in the Human Development Report are provided by a variety of public international sources and represent the best and most current statistics available for those indicators at the time of the preparation of this annual report. Calculations of HDI values and country rankings are the sole responsibility of the Human Development Report Office. The 2011 Human Development Report, an editorially independent publication commissioned by the United Nations Development Programme, was published in print and on line on November 2nd, 2011. Several mechanisms have also been adopted by the Human Development Report Office (HDRO) to ensure that the data they publish is of high quality and relevance. In addition to the small in-house team of qualified statisticians, a Senior Statistical Advisor reviews all of HDRO's statistical work. This process is supplemented by consultations with a standing Statistical Advisory Panel (SAP). A select group of distinguished national, international professionals and select United Nations Statistical Commission members participate in the Advisory Panel while the peer review process is done through leading regional and national statistical offices as well as international organizations. Nonetheless several data gaps and quality issues remain. These include issues of inconsistency and incoherence between international data series and the timing of data revisions by different agencies. International cooperation is improving these deficiencies and HDRO is an active participant in this process, bringing these issues to light in the global report and seeking resolution from the relevant agencies.

Appendix 1: Results by Indicator

10. Threatened Endemic Mammal, Bird and Amphibian Species

Country	M + B + A / Threatened	Index	Rating
Germany	0.000	1.0000	AAA
Saudi Arabia	0.000	1.0000	AAA
United Kingdom	0.000	1.0000	AAA
Russia	0.045	0.9545	AA+
Australia	0.133	0.8674	AA
Brazil	0.164	0.8360	AA
Canada	0.200	0.8000	AA
France	0.250	0.7500	A+
Argentina	0.254	0.7463	A
Indonesia	0.255	0.7454	A
United States	0.297	0.7034	A
South Korea	0.333	0.6667	A
China	0.352	0.6482	BBB+
Japan	0.382	0.6176	BBB+
Italy	0.389	0.6111	BBB+
India	0.441	0.5591	BBB
Turkey	0.500	0.5000	BBB
South Africa	0.538	0.4622	BB+
Mexico	0.557	0.4431	BB

SOURCE:

http://www.iucnredlist.org/documents/summarystatistics/2011_2_RL_Stats_Table8.pdf

This table shows the results of adding together the total number of endemic mammal, bird and amphibian species in each country and the dividing these totals by the total number of threatened mammal, bird and amphibian species.

These data have been extracted from an IUCN Red List table

Table 8: Total endemic and threatened endemic species in each country (totals by taxonomic group)

Endemics = species that are known to occur naturally within one country only.

Threatened = species assessed in any of the three threatened Red List categories (Critically Endangered, Endangered, Vulnerable)

Appendix 1: Results by Indicator

11. Marine Protected Areas (% of territorial waters)

Country	Marine Protected Areas % territorial waters	Index	Rating
Germany	40.3	1.0000	AAA
United States	28.6	0.7097	A
Australia	28.3	0.7022	A
France	21.3	0.5285	BBB
Italy	17.4	0.4318	BB
Mexico	16.7	0.4144	BB
Brazil	16.5	0.4094	BB
Russia	10.8	0.2680	B
South Africa	6.5	0.1613	CCC
United Kingdom	5.7	0.1414	CC
Japan	5.5	0.1365	CC
South Korea	3.9	0.0968	CC
Saudi Arabia	3.4	0.0844	C
Turkey	2.4	0.0596	C
Indonesia	2	0.0496	DDD
India	1.7	0.0422	DDD
China	1.3	0.0323	DDD
Canada	1.2	0.0298	DDD
Argentina	1.1	0.0273	DDD

SOURCE:
[http://data.worldbank.org/
 indicator/ER.MRN.PTMR.ZS](http://data.worldbank.org/indicator/ER.MRN.PTMR.ZS)

This table uses World Bank data to compare the percentage of territorial waters that each G20 nation has made into a marine protected area.

According to the World Bank, marine protected areas are areas of intertidal or subtidal terrain - and overlying water and associated flora and fauna and historical and cultural features - that have been reserved by law or other effective means to protect part or all of the enclosed environment.

United Nations Environmental Program and the World Conservation Monitoring Centre, as compiled by the World Resources Institute, based on data from national authorities, national legislation and international agreements.

Catalogue Sources World Development Indicators.

Appendix 1: Results by Indicator

12. Air quality: Annual mean PM10 for biggest city Particulate matter with diameter of 10 µm or less

Country	City	Air quality Annual mean PM10 ug/m3	x/max	Index	Rating
Australia	Sydney	12	0.0764	0.9236	AA+
United States	New York	21	0.1340	0.8660	AA
Canada	Quebec	22	0.1401	0.8599	AA
Japan	Tokyo	23	0.1465	0.8535	AA
Germany	Berlin	26	0.1656	0.8344	AA
United Kingdom	London	29	0.1847	0.8153	AA-
Russia	Moscow	33	0.2102	0.7898	A+
Italy	Rome	35	0.2229	0.7771	A+
Argentina	Bueno Aires	38	0.2420	0.7580	A+
France	Paris	38	0.2420	0.7580	A+
Indonesia	Jakarta	43	0.2739	0.7261	A
Turkey	Istanbul	59	0.3758	0.6242	BBB+
Brazil	Rio de Janeiro	64	0.4076	0.5924	BBB
South Korea	Seoul	64	0.4076	0.5924	BBB
Mexico	Mexico City (Toluca)	66	0.4204	0.5796	BBB
South Africa	Joburg	66	0.4204	0.5796	BBB
China	Guangzhou	70	0.4459	0.5541	BBB
India	Mumbai	132	0.8408	0.1592	CCC
Saudi Arabia	Riyadh	157	1.0000	0.0000	DDD

SOURCE:
http://www.who.int/phe/health_topics/outdoorair/databases/en/index.html

This table uses the mean weight of 10 micron particulate matter per m3 to assess air quality in the biggest city of each G20 nation. The data available for 10 micron particulate matter was more comprehensive than that available for the smaller 2.5 micron particulate matter, and used to compare the air quality of our target cities. Capital cities were not assessed, as some of these are unrepresentative administrative centres.

The World Health Organisation database contains results of urban outdoor air pollution monitoring from almost 1100 cities in 91 countries. Air quality is represented by annual mean concentration of fine particulate matter (PM10 and PM2.5, i.e. particles smaller than 10 or 2.5 microns).

The database covers the period from 2003 to 2010, with the majority of values for the years 2008 and 2009. The primary sources of data include publicly available national/subnational reports and web sites, regional networks such as the Asian Clean Air Initiative and the European Airbase, and selected publications. The database aims to be representative for human exposure, and therefore primarily captures measurements from monitoring stations located in urban background, urban traffic, residential, commercial and mixed areas. The world's average PM10 levels by region range from 21 to 142 ug/m3, with a world's average of 71 ug/m3.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Argentina

Indicator	Raw Data	Index	Rating
GDP per unit of energy	6.9	0.6970	A
Thermal Power Plant Efficiency	41	0.9318	AA+
CO2 per kWh generated	349	0.6770	A
CO2 per capita (2008)	4.8	0.7460	A
Protected Areas	1.7	0.0630	C
Forest Area x Deforestation Rate	-26416800	0.3669	BB
Water % of renewable water resource removed	4.00	0.8995	AA+
TI Corruption Index	3	0.3409	B+
Human Development Index	0.797	0.7970	A+
M + B + A endemic sp / threatened sp *	0.254	0.7463	A
Marine Protected Areas	1.1	0.0273	DDD
Air quality : Annual mean PM10 ug/m3	38	0.7580	A+
Mean Environmental Rating		0.5875	BBB

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Argentina does relatively well across many environmental indicators, but is let down by its comparatively small terrestrial and marine protected areas and a high level of deforestation.

Best: Argentina has energy efficient power stations (AA+) and removes a small proportion of its renewable water resource (AA+).

Worst: Argentina has some of the smallest marine protected areas in the G20 and has received the worst rating possible) (DDD).

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Australia

Indicator	Raw Data	Index	Rating
GDP per unit of energy	5.7	0.5758	BBB
Thermal Power Plant Efficiency	33	0.7500	A+
CO2 per kWh generated	928	0.0386	DDD
CO2 per capita (2008)	18.9	0.0000	DDD
Protected Areas	7	0.2593	B
Forest Area x Deforestation Rate	-99843580	0.2122	B
Water % of renewable water resource removed	4.58	0.8850	AA
TI Corruption Index	8.8	1.0000	AAA
Human Development Index	0.929	0.9290	AA+
M + B + A endemic sp / threatened sp *	0.133	0.8674	AA
Marine Protected Areas	28.3	0.7022	A
Air quality : Annual mean PM10 ug/m3	12	0.9236	AA+
Mean Environmental Rating		0.5953	BBB

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Australia varies greatly in its environmental performance. It does very well in several environmental indicators, but very poorly in comparison to many of its rich peers in terms of CO2 emissions.

Best: According to Transparency International Australia is the least corrupt nation in the world and it is hoped that this is true in relation to the environment (AAA).

Worst: Australia is the worst in the G20 in terms of its CO2 emissions per kWh and CO2 emissions per capita, due to an extremely high reliance on using coal to make electricity.

Appendix 2 : Results by Country

Environmental Rating 'National Report Cards'

Brazil

Indicator	Raw Data	Index	Rating
GDP per unit of energy	7.4	0.7475	A
Thermal Power Plant Efficiency	42	0.9545	AAA
CO2 per kWh generated	56	1.0000	AAA
CO2 per capita (2008)	1.9	0.8995	AA
Protected Areas	4.2	0.1556	CCC
Forest Area x Deforestation Rate	-200633160	0.0000	DDD
Water % of renewable water resource removed	0.71	0.9822	AAA
TI Corruption Index	3.8	0.4318	BB
Human Development Index	0.718	0.7180	A
M + B + A endemic sp / threatened sp *	0.164	0.8360	AA
Marine Protected Areas	16.5	0.4094	BB
Air quality : Annual mean PM10 ug/m3	64	0.5924	BBB
Mean Environmental Rating		0.6439	BBB+

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Brazil has rated extremely well in relation to its industrial CO2 emissions, water use and mammal, bird and amphibian conservation.

Best: Brazil's extensive use of hydro-electricity massively reduces the CO2 emissions it produces by burning fossil fuels (AAA). However, this form of electricity generation poses other significant environmental threats that are not captured in this rating.

Worst: Brazil still destroys very large areas of rainforest every year and has only awarded protected area status to a small proportion of its landmass (DDD).

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Canada

Indicator	Raw Data	Index	Rating
GDP per unit of energy	4.5	0.4545	BB+
Thermal Power Plant Efficiency	42	0.9545	AAA
CO2 per kWh generated	181	0.8622	AA
CO2 per capita (2008)	16.4	0.1323	CC
Protected Areas	10	0.3704	BB
Forest Area x Deforestation Rate	0	0.4225	BB
Water % of renewable water resource removed	1.58	0.9603	AAA
TI Corruption Index	8.7	0.9886	AAA
Human Development Index	0.908	0.9080	AA+
M + B + A endemic sp / threatened sp *	0.200	0.8000	AA
Marine Protected Areas	1.2	0.0298	DDD
Air quality : Annual mean PM10 ug/m3	22	0.8599	AA
Mean Environmental Rating		0.6453	BBB+

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Canada benefits from having energy efficient power stations, plenty of fresh water and low levels of corruption. Seven of Canada’s indicator ratings range from AAA to AA-, which is a considerable achievement. Unfortunately, Canada is seriously let down by its very low provision for marine protected areas and very high CO2 emissions per capita.

Best: Canada has three AAA environmental ratings and is a high achiever in several important respects.

Worst: Canada has made very poor provisions for marine protected areas and could do a lot better (DDD).

Appendix 2 : Results by Country

Environmental Rating 'National Report Cards'

China

Indicator	Raw Data	Index	Rating
GDP per unit of energy	3.6	0.3636	BB
Thermal Power Plant Efficiency	32	0.7273	A
CO2 per kWh generated	842	0.1334	CC
CO2 per capita (2008)	5.3	0.7196	A
Protected Areas	6.4	0.2370	B
Forest Area x Deforestation Rate	274233100	1.0000	AAA
Water % of renewable water resource removed	19.51	0.5100	BBB
TI Corruption Index	3.6	0.4091	BB
Human Development Index	0.687	0.6870	A
M + B + A endemic sp / threatened sp *	0.352	0.6482	BBB+
Marine Protected Areas	1.3	0.0323	DDD
Air quality : Annual mean PM10 ug/m3	70	0.5541	BBB
Mean Environmental Rating		0.5018	BBB-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: China has achieved mediocre to poor ratings for most indicators, but could significantly improve its environmental performance by using less coal to make electricity and increasing the size of its marine protected areas. Although other countries are worse, China's heavy use of water and poor air quality are areas for concern.

Best: China deserves praise for the efforts it has made to replant forests (AAA).

Worst: China has some of the smallest marine protected areas found in the G20 (DDD) and very dirty power stations (CC).

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

France

Indicator	Raw Data	Index	Rating
GDP per unit of energy	7.3	0.7374	A
Thermal Power Plant Efficiency	33	0.7500	A+
CO2 per kWh generated	83	0.9702	AAA
CO2 per capita (2008)	6.1	0.6772	A
Protected Areas	11.7	0.4333	BB
Forest Area x Deforestation Rate	4666200	0.4323	BB
Water % of renewable water resource removed	14.98	0.6238	BBB+
TI Corruption Index	7	0.7955	A+
Human Development Index	0.884	0.8840	AA
M + B + A endemic sp / threatened sp *	0.250	0.7500	A+
Marine Protected Areas	21.3	0.5285	BBB
Air quality : Annual mean PM10 ug/m3	38	0.7580	A+
Mean Environmental Rating		0.6950	A-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: For a developed country, France has relatively few high ratings. More positively, France has no terrible environmental ratings, which is a rare achievement. France’s consistently good, but not brilliant, ratings have given it a high overall ranking.

Best: France has very low CO2 emissions per kWh (AAA) due to its extensive use of nuclear power. It is unclear how well France is handling its nuclear liabilities and this will need to be a focus of future assessments.

Worst: France has a surprisingly high level of deforestation and comparatively poor coverage in terms of terrestrial protected areas (BB).

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Germany

Indicator	Raw Data	Index	Rating
GDP per unit of energy	8.3	0.8384	AA
Thermal Power Plant Efficiency	37	0.8409	AA
CO2 per kWh generated	433	0.5843	BBB
CO2 per capita (2008)	9.6	0.4921	BB+
Protected Areas	27	1.0000	AAA
Forest Area x Deforestation Rate	0	0.4225	BB
Water % of renewable water resource removed	20.97	0.4734	BB+
TI Corruption Index	8	0.9091	AA+
Human Development Index	0.905	0.9050	AA+
M + B + A endemic sp / threatened sp *	0.000	1.0000	AAA
Marine Protected Areas	40.3	1.0000	AAA
Air quality : Annual mean PM10 ug/m3	26	0.8344	AA
Mean Environmental Rating		0.7750	A+

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Germany rates very well according to most indicators and comes top overall. It does poorly in terms of CO2 emissions and water removal. Germany’s power stations are surprisingly inefficient and appear to rely heavily on coal to make electricity. CO2 emissions per capita are also quite high. Germany has designated a large proportion of its small coastline as marine protected areas and rates well for threats to endemic species because it has so few unique mammal, bird or amphibian species (AAA).

Best: Germany has done well to give 27% of its land area protected status.

Worst: Germany’s worst performance occurs in relation to its forests, which are not changing in size. This suggests a lack of new forest / conservation policies.

Appendix 2 : Results by Country

Environmental Rating 'National Report Cards'

India

Indicator	Raw Data	Index	Rating
GDP per unit of energy	5.1	0.5152	BBB
Thermal Power Plant Efficiency	27	0.6136	BBB+
CO2 per kWh generated	963	0.0000	DDD
CO2 per capita (2008)	1.4	0.9259	AA+
Protected Areas	4.8	0.1778	CCC
Forest Area x Deforestation Rate	14217210	0.4524	BB+
Water % of renewable water resource removed	39.82	0.0000	DDD
TI Corruption Index	3.1	0.3523	BB
Human Development Index	0.547	0.5470	BBB
M + B + A endemic sp / threatened sp *	0.441	0.5591	BBB
Marine Protected Areas	1.7	0.0422	DDD
Air quality : Annual mean PM10 ug/m3	132	0.1592	CCC
Mean Environmental Rating		0.3621	BB-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: India has received many poor environmental ratings. This suggests that it faces a large number of serious environmental problems and is struggling to tackle them. Electricity generation has extremely high emissions per kWh, which indicates a very significant reliance on coal. Additional concern is drawn to the poor air quality rating and the heavily stretched water resources.

Best: India achieves very low fossil fuel CO2 emissions per capita (AA+). However, it is possible that middle class consumers match rich country consumers in their per capita emissions.

Worst: India's electricity generation and water systems (DDD) would appear well placed to benefit from modernisation, cleaner fuels and a focus on efficiency.

Appendix 2 : Results by Country

Environmental Rating 'National Report Cards'

Indonesia

Indicator	Raw Data	Index	Rating
GDP per unit of energy	4.4	0.4444	BB
Thermal Power Plant Efficiency	35	0.7955	A+
CO2 per kWh generated	715	0.2734	B
CO2 per capita (2008)	1.8	0.9048	AA+
Protected Areas	9.7	0.3593	BB
Forest Area x Deforestation Rate	-62831450	0.2902	B
Water % of renewable water resource removed	5.61	0.8591	AA
TI Corruption Index	3	0.3409	B+
Human Development Index	0.617	0.6170	BBB+
M + B + A endemic sp / threatened sp *	0.255	0.7454	A
Marine Protected Areas	2	0.0496	DDD
Air quality : Annual mean PM10 ug/m3	43	0.7261	A
Mean Environmental Rating		0.5338	BBB-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Indonesia has done quite well in relation to several important indicators and rarely comes bottom despite its population pressures. The biggest problems this assessment highlights in Indonesia include its small marine protected areas and significant levels of deforestation. More positively, Indonesia seems to have done a good job of conserving known mammal, bird and amphibian species.

Best: Indonesia has relatively low fossil fuel emissions per capita (AA+) and removes only a low proportion of its renewable water supplies (AA).

Worst: Indonesia's small Marine Protected Areas (DDD) and on-going deforestation are the biggest areas for concern.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Italy

Indicator	Raw Data	Index	Rating
GDP per unit of energy	9.7	0.9798	AAA
Thermal Power Plant Efficiency	42	0.9545	AAA
CO2 per kWh generated	375	0.6483	BBB+
CO2 per capita (2008)	7.5	0.6032	BBB+
Protected Areas	7.3	0.2704	B
Forest Area x Deforestation Rate	8781520	0.4410	BB
Water % of renewable water resource removed	23.69	0.4051	BB
TI Corruption Index	3.9	0.4432	BB
Human Development Index	0.874	0.8740	AA
M + B + A endemic sp / threatened sp *	0.389	0.6111	BBB+
Marine Protected Areas	17.4	0.4318	BB
Air quality : Annual mean PM10 ug/m3	35	0.7771	A+
Mean Environmental Rating		0.6199	BBB+

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Italy is getting a lot right. It is a member of the small group of G20 nations that has no environmental ratings below a B. Compared to many other EU nations, Italy converts energy into money efficiently, uses efficient power stations and avoids producing high CO2 emissions to make electricity or per capita. If Italy addressed some of the indicators where it only achieved a B or BB it could make significant progress.

Best: Italy does very well in terms of economic and energy efficiency (AAA).

Worst: Italy has fallen behind some of the other EU nations in the G20 in terms of its terrestrial protected areas (B).

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Japan

Indicator	Raw Data	Index	Rating
GDP per unit of energy	8.1	0.8182	AA
Thermal Power Plant Efficiency	44	1.0000	AAA
CO2 per kWh generated	438	0.5788	BBB
CO2 per capita (2008)	9.5	0.4974	BB+
Protected Areas	6.8	0.2519	B
Forest Area x Deforestation Rate	994720	0.4246	BB
Water % of renewable water resource removed	20.93	0.4744	BB+
TI Corruption Index	8	0.9091	AA+
Human Development Index	0.901	0.9010	AA+
M + B + A endemic sp / threatened sp *	0.382	0.6176	BBB+
Marine Protected Areas	5.5	0.1365	CC
Air quality : Annual mean PM10 ug/m3	23	0.8535	AA
Mean Environmental Rating		0.6219	BBB+

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Given Japan’s economic power it is surprising that it has not achieved more AAA ratings. This suggests a level of under-performance in relation to environmental protection. In particular, the relatively high level of deforestation and poor track record in relation to threatened mammal, bird and amphibian species are surprising in such a rich country.

Best: Japan appears to have the most efficient power stations in the G20 (AAA), but also to have a high reliance on coal and gas.

Worst: It is noticeable that Japan has created rather small terrestrial and marine protected areas in comparison to other rich and densely populated countries in the G20.

Appendix 2 : Results by Country

Environmental Rating 'National Report Cards'

Mexico

Indicator	Raw Data	Index	Rating
GDP per unit of energy	7.9	0.7980	A+
Thermal Power Plant Efficiency	42	0.9545	AAA
CO2 per kWh generated	477	0.5358	BBB
CO2 per capita (2008)	4.4	0.7672	A+
Protected Areas	2.4	0.0889	C
Forest Area x Deforestation Rate	-15417120	0.3900	BB
Water % of renewable water resource removed	17.45	0.5618	BBB
TI Corruption Index	3	0.3409	B+
Human Development Index	0.77	0.7700	A+
M + B + A endemic sp / threatened sp *	0.557	0.4431	BB
Marine Protected Areas	16.7	0.4144	BB
Air quality : Annual mean PM10 ug/m3	66	0.5796	BBB
Mean Environmental Rating		0.5537	BBB

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Mexico occupies the middle rankings for most of our indicators. Mexico's environmental performance is neither very good nor very bad for most of the indicators. Mexico seems particularly weak in relation to its terrestrial and marine protected areas, deforestation and conservation of endemic species.

Best: Although Mexico appears to have modern power stations that are very efficient (AAA) its high CO2 emissions per kWh indicate a heavy reliance on coal.

Worst: Mexico's most striking weakness is the small size of its terrestrial protected areas (C).

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Russia

Indicator	Raw Data	Index	Rating
GDP per unit of energy	3	0.3030	B+
Thermal Power Plant Efficiency	26	0.5909	BBB
CO2 per kWh generated	341	0.6858	A
CO2 per capita (2008)	12.1	0.3598	BB
Protected Areas	3.1	0.1148	CC
Forest Area x Deforestation Rate *	-129406400	0.1500	CCC
Water % of renewable water resource removed	1.47	0.9631	AAA
TI Corruption Index	2.4	0.2727	CCC
Human Development Index	0.755	0.7550	A+
M + B + A endemic sp / threatened sp *	0.045	0.9545	AA+
Marine Protected Areas	10.8	0.2680	B
Air quality : Annual mean PM10 ug/m3	33	0.7898	A+
Mean Environmental Rating		0.5173	BBB-

* Note: Forest data has been estimated

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Russia’s environmental ratings range between being very good to rather bad. Russia has not received any DDD ratings and deserves some acknowledgement for this.

Best: Russia removes only a small fraction of its total renewable water supply (AAA). However, the shrinkage of the Aral Sea suggests that regional water problems are being masked at the national scale.

Worst: Russia’s worst rating is due to its lack of terrestrial protected areas (CC). This factor could be relevant to the large-scale deforestation (CCC) occurring in Russia, which appears to be greater than Indonesia’s and only lower than Brazil’s.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Saudi Arabia

Indicator	Raw Data	Index	Rating
GDP per unit of energy	3.5	0.3535	BB
Thermal Power Plant Efficiency	31	0.7045	A
CO2 per kWh generated	752	0.2326	B
CO2 per capita (2008)	17.2	0.0899	C
Protected Areas	2.3	0.0852	C
Forest Area x Deforestation Rate	0	0.4225	BB
Water % of renewable water resource removed	943.30	0.0000	DDD
TI Corruption Index	4.4	0.5000	BBB
Human Development Index	0.77	0.7700	A+
M + B + A endemic sp / threatened sp *	0.000	1.0000	AAA
Marine Protected Areas	3.4	0.0844	C
Air quality : Annual mean PM10 ug/m3	157	0.0000	DDD
Mean Environmental Rating		0.3536	BB-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Saudi Arabia has been the most surprising country to assess. Despite its vast oil wealth, it has a large number of bad environmental ratings and two very bad DDD-ratings. Saudi Arabia also has three extremely low C-ratings for CO2 emissions per capita, terrestrial protected areas and marine protected areas.

Best: Saudi Arabia's only AAA-rating is for the conservation status of mammal, bird and amphibian endemics. Unfortunately, this is not as impressive as it could be, as it has no endemic species in these taxa.

Worst: Saudi Arabia removes 943.30% of its annual renewable water supply (DDD). This is totally unsustainable and a very major cause for concern. Saudi Arabia also received the bottom rating in the G20 for its air quality, with another DDD rating.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

South Africa

Indicator	Raw Data	Index	Rating
GDP per unit of energy	3.1	0.3131	B+
Thermal Power Plant Efficiency	38	0.8636	AA
CO2 per kWh generated	817	0.1610	CCC
CO2 per capita (2008)	8.8	0.5344	BBB
Protected Areas	5.4	0.2000	B
Forest Area x Deforestation Rate	0	0.4225	BB
Water % of renewable water resource removed	24.53	0.3840	BB
TI Corruption Index	4.1	0.4659	BB+
Human Development Index	0.619	0.6190	BBB+
M + B + A endemic sp / threatened sp *	0.538	0.4622	BB+
Marine Protected Areas	6.5	0.1613	CCC
Air quality : Annual mean PM10 ug/m3	66	0.5796	BBB
Mean Environmental Rating		0.4306	BB

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: South Africa has only one high rating, for the efficiency of its power stations (AA). South Africa has not come bottom in any of the indicator ratings, and has achieved respectable middle rankings for most indicators.

Best: South Africa’s Human Development Index (BBB+) provides it highest rating. This understandably reflects the country’s post-Apartheid priorities.

Worst: South Africa has achieved a poor CCC rating for CO2 per kWh due to a massive reliance on coal. It has received another CCC rating for its marine protected areas, which are small in comparison to its coastline.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

South Korea

Indicator	Raw Data	Index	Rating
GDP per unit of energy	5.5	0.5556	BBB
Thermal Power Plant Efficiency	40	0.9091	AA+
CO2 per kWh generated	489	0.5226	BBB
CO2 per capita (2008)	10.6	0.4392	BB
Protected Areas	2.4	0.0889	C
Forest Area x Deforestation Rate *	-626500	0.4212	BB
Water % of renewable water resource removed	11.22	0.7182	A
TI Corruption Index	5.4	0.6136	BBB+
Human Development Index	0.897	0.8970	AA
M + B + A endemic sp / threatened sp *	0.333	0.6667	A
Marine Protected Areas	3.9	0.0968	CC
Air quality : Annual mean PM10 ug/m3	64	0.5924	BBB
Mean Environmental Rating		0.5434	BBB-

* Note: Forest data has been estimated

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: South Korea’s poor environmental ratings are very similar to those seen in Japan. Overall, South Korea’s predominance of BBB+ to A ratings reflects a significant level of under-performance, for such a wealthy and modern country.

Best: South Korea’s best AA+ rating was due to its efficient power stations. However, this positive is undermined by its rather high CO2 emissions per kWh.

Worst: South Korea lowest ratings are associated with its small terrestrial (C) and marine protected areas (CC), which may help to explain the observed threats to endemic species.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

Turkey

Indicator	Raw Data	Index	Rating
GDP per unit of energy	8.9	0.8990	AA
Thermal Power Plant Efficiency	43	0.9773	AAA
CO2 per kWh generated	490	0.5215	BBB
CO2 per capita (2008)	4	0.7884	A+
Protected Areas	0.4	0.0148	DDD
Forest Area x Deforestation Rate	10989000	0.4456	BB
Water % of renewable water resource removed	18.77	0.5286	BBB
TI Corruption Index	4.2	0.4773	BB+
Human Development Index	0.699	0.6990	A
M + B + A endemic sp / threatened sp *	0.500	0.5000	BBB
Marine Protected Areas	2.4	0.0596	C
Air quality : Annual mean PM10 ug/m3	59	0.6242	BBB+
Mean Environmental Rating		0.5446	BBB-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Given Turkey’s emerging economy status it has achieved an impressive number of AAA – BBB ratings. In particular, Turkey has out-performed many richer nations in its ability to convert energy into to earnings and its CO2 emissions per capita.

Best: Turkey has achieved an AAA rating in relation to the efficiency of its power stations. This indicates that it has invested in some modern infrastructure. However, the high CO2 emissions per kWh also indicate that Turkey’s power stations are predominantly powered by coal.

Worst: Turkey has created the smallest terrestrial protected areas in the G20 (DDD) along with very small marine protected areas (C) in relation to its coastline. Both categories of protected area could be significantly enlarged.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

United Kingdom

Indicator	Raw Data	Index	Rating
GDP per unit of energy	9.9	1.0000	AAA
Thermal Power Plant Efficiency	44	1.0000	AAA
CO2 per kWh generated	435	0.5821	BBB
CO2 per capita (2008)	8.5	0.5503	BBB
Protected Areas	20.5	0.7593	A+
Forest Area x Deforestation Rate	711250	0.4240	BB
Water % of renewable water resource removed	8.82	0.7785	A+
TI Corruption Index	7.8	0.8864	AA
Human Development Index	0.863	0.8630	AA
M + B + A endemic sp / threatened sp *	0.000	1.0000	AAA
Marine Protected Areas	5.7	0.1414	CC
Air quality : Annual mean PM10 ug/m3	29	0.8153	AA-
Mean Environmental Rating		0.7334	A

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: The UK is one of surprise success stories of this assessment. The UK's overall rating is only just behind that achieved by Germany. This reflects the fact that the majority of the UK's ratings are in the upper reaches of the G20 range, between AAA and A+. The indicators that let the UK down include its comparatively small marine protected areas, mediocre CO2 emissions per kWh and CO2 emissions per capita and on-going land clearance.

Best: The UK has achieved AAA ratings for its economic efficiency and efficient power stations.

Worst: The UK's worst environmental rating (CC) is due to its small marine protected areas in comparison to most other G20 nations.

Appendix 2 : Results by Country

Environmental Rating ‘National Report Cards’

United States

Indicator	Raw Data	Index	Rating
GDP per unit of energy	5.8	0.5859	BBB
Thermal Power Plant Efficiency	39	0.8864	AA
CO2 per kWh generated	508	0.5017	BBB
CO2 per capita (2008)	17.5	0.0741	C
Protected Areas	13.4	0.4963	BB+
Forest Area x Deforestation Rate	121235600	0.6778	A
Water % of renewable water resource removed	15.57	0.6090	BBB+
TI Corruption Index	7.1	0.8068	AA
Human Development Index	0.91	0.9100	AA+
M + B + A endemic sp / threatened sp *	0.297	0.7034	A
Marine Protected Areas	28.6	0.7097	A
Air quality : Annual mean PM10 ug/m3	21	0.8660	AA
Mean Environmental Rating		0.6539	A-

* Mammal + Bird + Amphibian endemic sp / threatened endemic sp

Overall: Despite being a global super power it is noticeable that the US has not achieved any AAA ratings and does not lead the world in any indicator of environmental performance. This situation represents a high level of underperformance. Of all the rich nations, the US is the best placed to adopt the methods already used to deliver resource efficiency and cleaner energy supplies in other G20 nations.

Best: The highest rating achieved by the US is the one least related to the environment, the human development index (AA+).

Worst: CO2 emissions per capita in the US (C) are roughly double those in the UK, 3 times those in China, 4 times those in Mexico, 9 times those in Brazil and 12 times in India.

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