

WWF Climate Scorecards

Assessment of the climate performance of the G8 plus 5 countries

Version 2007



Emissions, projections and climate policies for Canada, France, Germany, Italy, Japan, Russia, United Kingdom and Unites States of America

Includes background information for China, Brazil, India, Mexico and South Africa

Prepared by Ecofys Germany/Netherlands for WWF





The G8 Climate Scorecards were commissioned jointly by Allianz, a leading global financial service provider, and WWF, a leading global environmental NGO.

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Executive summary

Climate change is a serious and urgent threat to global society. It adds stress to unique and already threatened ecosystems, increases the frequency and intensity of extreme weather events, such as storms and droughts, and adds stress to agriculture and food production. In addition, glaciers are melting around the world as is the Arctic, contributing to sea level rise. Climate change also increases the risk of large-scale singular events such as the melting of the West Antarctic Ice Sheet and the shutdown of the thermohaline circulation.

The level at which climate change becomes "dangerous" depends on the values attached to the threatened systems. Several countries, most prominently the EU, but also e.g. the Philippines and Micronesia, have agreed that global average temperature increase in comparison to pre-industrial levels should be kept below 2°C. As a consequence, global greenhouse gas emissions will have to peak in the next 10 to 15 years and then decline to a fraction of current levels. Leaving some room for growth for developing countries, industrialized countries need to decrease their emission by the order of 80% by the year 2050. This is a major challenge, as current trends are going in the opposite direction with high emissions in developed countries and growing emissions in most developing countries.

Given the urgency of the challenge, the German G8 presidency has placed climate change and reducing emissions high on this years' G8 plus 5 agenda. In particular, the major industrialized countries have a large responsibility for taking the lead through committing to deep cuts in their own emissions in the order of at least –30% by 2020, and through putting policies and measures in place to achieve these targets. They also have a responsibility to drive global climate cooperation with the G5 countries, as well as to send the political signal that the next UN climate talks in Bali this December have to launch comprehensive post-2012 climate negotiations for a global Kyoto Plus agreement.

Individual countries have reacted differently to this climate challenge. Each country is unique in its starting position, including the economic activities that result in greenhouse gas emissions, its level of development, industrial structure, availability of natural resources and public perceptions. Since the problem was recognized internationally (1992 with the adoption of the United Nations Framework Convention on Climate Change), governments and the public have reacted differently, also depending on national circumstances.

These climate scorecards provide a comparable snapshot of the current situation across the G8 countries (Canada, France, Germany, Italy, Japan, Russia, United Kingdom and United States of America) as well as five major developing countries (Brazil, China, India, Mexico and South Africa). They provide recent and expected emission developments of each country and various other indicators. The scorecards also provide an overview of the most important activities by the governments to respond to the threat of climate change. For the G8 countries, they finally provide an overall summary evaluation of the climate performance of the country based on all of the criteria covered in the scorecards. This is based on the core benchmark that countries implement enough measures to reduce emissions by the order of 80% by 2050 so as to keep the global-average temperature increase below 2°C in comparison with pre-industrial levels.

The scoring, based on the ten indicators, demonstrates that none of the G8 countries are implementing enough measures to be considered in line with the 2°C limit (see summary table page 34). Three countries have failed the test: USA, Canada and Russia. The United States scores the worst of all G8 countries, not having ratified the Kyoto Protocol, nor having put any substantive federal measures in place to curb emissions in the short term. Russia and Canada also have increasing emissions and no policy in place. Of the two in particular Canada has taken little measures to curb its greenhouse gas emissions, and the current government has taken up a policy stand, which puts it sharply at odds with its Kyoto obligations as an advanced industrialized country. Italy and Japan rank a little

better but are still far away from making a contribution to staying below 2°C. The three countries furthest along this track are UK, France and Germany, but each is likely to see increases in emissions if further measures are not implemented soon.

Information is also provided for major developing countries (Brazil, China, India, Mexico and South Africa), where a number of initiatives are already underway. These five countries are expecting large growth of emissions in the future and the question remains how G8 countries will assist them in developing in a less carbon intensive manner. These countries have not been scored in the same manner as G8 due to their different national circumstances and level of development.

Emission trends

Includes the historical trend and future projections of emissions of those greenhouse gases and sectors that are relevant under the Kyoto Protocol in comparison to the Kyoto target.

Emissions by sectors

Includes the split of emissions into the different sectors. It shows which activities are responsible for the emissions.

Energy sources

As most greenhouse gas emissions originate from energy use, it is instructive to examine the energy mix of a country. The chart shows the primary energy consumption, which includes also energy that is consumed but not used such as waste heat.

General climate policies

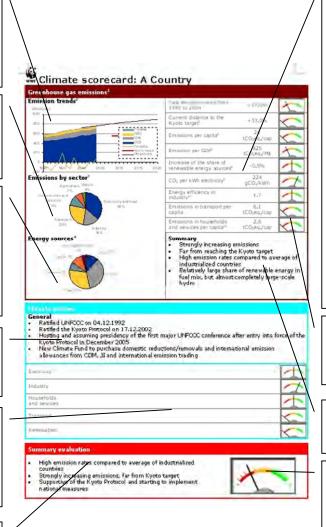
A brief description of the general climate policies put in place by the national government.

Sector policies and climate meters

A description of the status of the climate policies in place in different sectors. Assessment of the relative comparison of the ambition level and comprehensiveness of policies.

Summary evaluation

A general evaluation of the countries' climate performance based on the information provided above.



Indicators

- Past emission trends over the whole economy
- Current distance to the Kyoto target as magnitude of emission reductions still necessary to reach the Kyoto target
- Change in share of renewable energy sources showing efforts made to use more renewable energy since 1990
- Emissions per capita
- Emission per Gross Domestic Product
- CO₂ per kWh electricity of electricity production (national aggregate)
- Energy efficiency in industry as a qualitative aggregate for major industries
- Greenhouse gas emissions in transport per capita
- Greenhouse gas emissions in households and services per capita excluding emissions from use of electricity

Climate meters

An approximate indication how these indicators relate to the necessary level to stay below the 2°C limit.

Summary

Qualitative synthesis of the emission indicators.

Climate meter

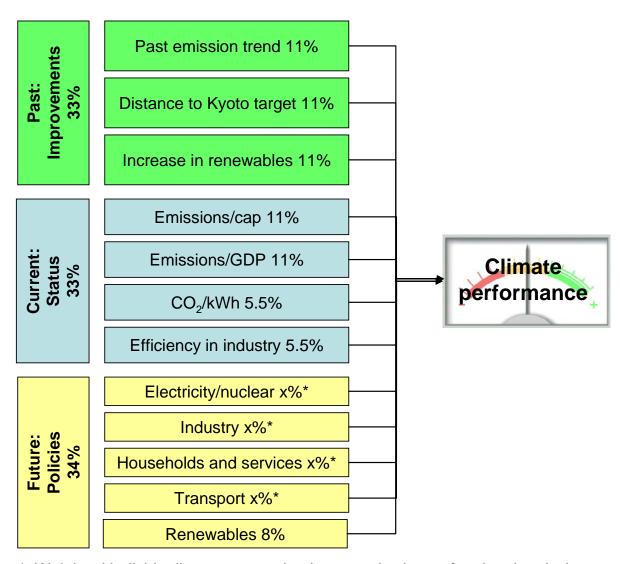
A visualisation of the approximate overall climate performance taking into account the emission indicators and the climate policies. The benchmark is, whether a country is on a path to keep the global-average temperature increase below 2°C in comparison with pre-industrial levels.

Aggregation method

For the G8 countries, the overall performance is assessed by aggregating the individual indicators. Past, present and future performance is weighted 1/3 each. All indicators are aggregated using the weights shown below.

For each numerical indicator for the past trend and current situation, a score between -2.5 and +2.5 is given, where the extremes are the worst and best performance within developed countries, not considering small country outliers. The middle position of the meter (score 0) is chosen in line with keeping global average temperature increase below 2°C.

The implemented national government policies in each sector are rated between -2.5 (lacking or symbolic) and +2.5 (ambitious and/or very innovative) by expert judgement. WWF does not think nuclear power is a viable policy option. A policy approach that favours use of nuclear power is weighted negatively. Sub-national level policies are not taken into account in the assessment.



^{*:} Weighted individually per country by the sector's share of national emissions

The scores (between -2.5 to 2.5) for each numerical indicator, each policy field and the summary climate performance are translated into graphical meters:



-2.5 to -1.5



-1.5 to -0.5



-0.5 to 0.5



0.5 to 1.5



1.5 to 2.5



Climate scorecard: Canada

Greenhouse gas emissions¹ **Emission trends²** Past emission trend from +27.0% 1990 to 20045 (MtCO2ea.) 1000 Current distance to the +33.0 Kyoto target⁶ %-points 800 F-gases Increase of the share of 600 N2O -0.5% ■ CH4 renewable energy sources⁷ CO2 400 Forestry 24 Kyoto target Emissions per capita⁸ 200 tCO2eq./cap Projections 825 Emission per GDP9 -200 1990 2000 1995 2020 2010 2015 tCO₂eq./M\$ Emissions by sector³ 224 CO₂ per kWh electricity¹⁰ gCO₂/kWh Agriculture Waste Energy efficiency in 1.7 Households and industry¹¹ services Electricity and heat 11% Emissions in transport per 6.1 capita 12 tCO₂eq./cap Transpor Emissions in households 2.6 and services per capita¹³ Industry tCO2eq./cap Energy sources4 **Summary** Solar/Wind/Other Strongly increasing emissions Biomass/Waste 0.03% Geothermal Far from reaching the Kyoto target 0.00% Coal Very high emission rates per capita compared to the Hydro 11% average of industrialized countries 11% Relatively large share of renewable energy in fuel Nuclear Oil mix, but almost completely large-scale hydro Plans to exploit oil from tar sands, which is very CO₂ Gas 30%

Climate policies

General

- Ratified UNFCCC on 04.12.1992, ratified the Kyoto Protocol on 17.12.2002
- Effectively reneged on Kyoto target on 26.04.2007 the Canadian government committed to a 20% reduction below 2006 emission levels by 2020, i.e.: 11% above the Kyoto target in 2020.
- Federal Government will not purchase international emission credits or participate in the int. trading market

Electricity/ nuclear Industry	Regulatory Framework for Air Emissions (26.04.2007), targets 700 large final emitters (LFEs) to take effect in 2010. A 15% improvement in emission intensity for existing facilities relative to 2006 levels is targeted in first two years, with an annual improvement of 2% thereafter. New facilities are granted a 3 year grace period. Contribution to a 'technology fund' in lieu of reductions possible. Access to trading scheme with many limitations proposed. Supportive of nuclear energy.	
Households and services	Labelling and energy performance standards for many energy-using appliances. Financial incentives available for energy efficiency retrofits to a modest number of households.	-
Transport	Fuel efficiency standards set for passenger vehicles, not trucks. Voluntary improvement targets are established for the automotive sector by 2010. The federal government has announced its intent to segue in 2011 to the dominant (less efficient) North American standard ethanol target of 5% by 2010 and 2% bio diesel by 2012, with modest financial incentives available for bio fuel producers.	
Renewables	Incentives for a modest amount of renewable energy production. However, in 2006 the Canadian government indicated a suspension of funding for new Wind Power Production Incentive projects.	*

- Very high emission rates per capita compared to the average of industrialized countries
- Strongly increasing emissions in most sectors.
- Current action plan (focused on large emitters) will not nearly ensure compliance of Canada's Kyoto target
- No comprehensive national climate change strategy



- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006). www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² Additional allowances can be generated optionally from "Forest Management" up to the amount of 44 MtCO₂/y (Annex to decision 11/CP.7 in UNFCCC document FCCC/CP/2001/13/Add.1). This would represent 7% of the base year emissions. The projections are taken from the National Communication to UNFCCC "Canada's fourth national report on climate change 2006". GHG projection, including current policies. http://unfccc.int/resource/docs/natc/cannc4.pdf
- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".
- "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".

 ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ The Canadian government has not yet submitted the country's greenhouse gas inventory for 2005 to the UNFCCC.
- ⁶ Difference between emissions in 2004 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance by 7 percentage points.
- Or Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁸ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁹ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), retrieved on 24 August 2006.
- ¹⁰ For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006 (Kuramochi, Takeshi. 2006. Greenhouse gas emissions reduction based on a bottom-up approach: Focus on industrial energy efficiency benchmarking and future industrial activity indicators. Utrecht: University of Utrecht). An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹³ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- 14 http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=4F2292E9-3EFF-48D3-A7E4-CEFA05D70C21



Climate scorecard: France

Greenhouse gas emissions¹ **Emission trends²** Past emission trend from -1.8% (MtCO₂eq.) 1990 to 2005 700 Current distance to the -1.8 600 Kyoto target⁵ %-points 500 F-gases N2O 400 Increase of the share of CH4 CO2 -0.6% 300 renewable energy sources⁶ 200 100 Emissions per capita⁷ n tCO₂eq./cap -1001990 1995 2005 2010 2015 346 Emission per GDP8 tCO2eq./M\$ Emissions by sector³ 82 CO₂ per kWh electricity⁹ Agriculture Electricity and heat gCO₂/kWh 13% Energy efficiency in 1.3 industry 10 Industry 22% Households and Emissions in transport per 2.4 services capita 11 tCO2eq./cap 20% Emissions in households 1.8 Transport and services per capita 12 tCO2eq./cap Energy sources4 Geothermal **Summary** Biomass/Waste 0.05% Emission below Kyoto target, also due to elimination 4% Coal Solar/Wind/Other of industrial N2O, but increasing emissions in 0.03% transports and households/services Hydro Oil Generally low emission rates compared to average 2% 33% of industrialized countries because of a high share of Nuclear nuclear energy in the energy mix, which WWF does 42% not consider as viable policy Gas Emissions expected to rise in the future, but a promising situation in 2005 and 2006 (stabilization of primary energy consumption and emissions in the transport sector).

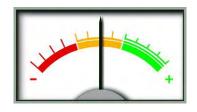
Climate policies

General

- Ratified UNFCCC on 25.03.1994, ratified the Kyoto Protocol on 31.05.2002
- Supports that global temperature increase should be kept below 2°C¹³
- Long-term national emissions target: -75% by 2050 compared to 1990 level for all GHG
- Agreed to ambitious EU targets for 2020: unilaterally reduce GHG emissions 20% below 1990 and 30%, if other countries commit to similar efforts, save 20% energy consumed and increase renewables to a 20% share

Electricity/ nuclear	Participant in the EU Emission Trading Scheme. Mandatory targets imposed on utilities to promote energy efficiency by demand side actions (white certificate scheme). Financial incentives for combined heat and power. Strong support for nuclear power.	
Industry	Industry Participant in the EU Emission Trading Scheme. Voluntary agreements. Allocated €12 mn/y for energy audits.	
Households and services		
Transport	Support for biofuels. Voluntary agreements with the automotive industry. CO ₂ emissions labels on new cars. Additional taxation for cars emitting more than 200gCO ₂ /km.	1
Renewables	Financial incentives for renewable energy sources and guaranteed tariffs for delivered electricity.	

- Emission rates are low for industrialized countries due to high share of nuclear energy, which WWF does not consider as viable policy
- Emissions currently below Kyoto target, although emissions in transports and households/services increased, and total emissions are projected to increase if not further policies are implemented
- Most ambitious long-term target, ambitious EU GHG emission reduction target by 2020



- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006), www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² Additional allowances can be generated optionally from "Forest Management" up to the amount of 3.2 Mt CO₂/y (Annex to decision 11/CP.7 in UNFCCC document FCCC/CP/2001/13/Add.1). This would represent 0.6% of the base year emissions. The projections are taken from the National Communication to UNFCCC "Quatrième communication nationale à la Convention cadre des Nations unies sur les changements climatiques 2006". GHG projection, including current policies. http://unfccc.int/resource/docs/natc/franc4f.pdf
- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".

 ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Difference between emissions in 2004 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance 0.6 percentage points.
- ⁶ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- For the year 2005. Population in 2005 is based on United Nations World Population Prospectus (UN 2006).
- ⁸ For the year 2005. Gross Domestic Product is based on World Development Indicators (World Bank 2006), retrieved on 24 August 2006.
- 9 For the year 2004. Based on IEA (2006) CO $_{2}$ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France. Although emissions per kWh are very low in reality, the climate meter is in the middle position, since WWF does not consider nuclear energy a viable option.
- ¹⁰ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- 11 This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹² For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹³ Ministere de l' Ecologie et du Developpement Durable; Climate Plan 2004; 2004.



Climate scorecard: Germany

Greenhouse gas emissions¹ **Emission trends²** Past emission trend from -18.4% 1990 to 2005 (MtCO₂eq.) 1400 Current distance to the +2.6 1200 Kyoto target⁵ %-points 1000 800 Increase of the share of 2.1% 600 renewable energy sources⁶ H4 O2 400 orestry 200 Projections 12 Emissions per capita⁷ 0 tCO₂eq./cap -2001990 1995 2000 2005 2015 2020 2010 467 Emission per GDP8 tCO2eq./M\$ Emissions by sector³ Agriculture Waste 499 CO₂ per kWh electricity⁹ gCO₂/kWh Households and Energy efficiency in services Electricity and heat 1.3 industry 10 17% 38% Emissions in transport per 2.1 Transpor capita 11 tCO₂eq./cap 17% Industry Emissions in households 2.1 21% and services per capita 12 tCO2eq./cap Energy sources4 **Summary** 0.48% Solar/Wind/Other Strong dependence on coal (CO₂-intensive lignite) 0.54% Biomass/Waste Geothermal and oil 0.04% Decreasing emissions 1990 to 2000, partly due to Coal Nuclear economic downturn in Eastern Germany, but only 25% 12% stable emissions in recent years Gas Small distance to Kyoto target, but new measures likely needed to meet target as emissions in CO2-Oil intensive sectors are increasing 36% Large share of new renewable energy sources

Climate policies

General

- Ratified UNFCCC on 09.12.1993, ratified the Kyoto Protocol on 31.05.2002
- Supports that global temperature increase should be kept below 2°C
- Envisages 40% emission reduction by 2020 compared to 1990 if EU commits to 30%¹³
- Agreed to ambitious EU targets for 2020: unilaterally reduce GHG emissions 20% below 1990 and 30%, if other countries commit to similar efforts, save 20% energy consumed and increase renewables to a 20% share
- Initiated the "KfW Carbon Fund" to pool industry demand for credits from CDM projects
- Moves forward the debate on climate change within the G8 and other international fora

Electricity/ nuclear	Participant in the EU Emission Trading Scheme, but not ambitious. Generous allocation for new lignite and coal power stations. Combined heat and power programme is in place that shows little effect. Phase out of nuclear power.	***
Industry	Participant in the EU Emission Trading Scheme, but not ambitious. Energy saving ordinance for small/medium industries.	
Households and services	Favourable loans for low ${\rm CO_2}$ emitting heating and insulation. Energy saving ordinance; building standards are ambitious, but there are no penalties in place.	
Transport	Voluntary efficiency enhancement from automotive industry, but no German manufacturer is likely to meet the agreement. Energy-efficiency labels on new cars.	*
Renewables	Guaranteed tariffs for delivered electricity from renewable sources through feed-in law, which led to considerable increase of renewable capacity. Aims to produce 12.5% of electricity from RE by 2010. Most probably, this share will already be reached in 2007.	

- High emission rates from electricity generation due to use of coal/lignite
- Declining emissions 1990 to 2000 partly due to economic downturn in Eastern Germany but also due to national measures. Since then stable emissions and likely gap to meet Kyoto target without further measures
- Successful promotion of new renewable energy sources, but less ambitious for electricity production from fossil fuels: Privilege for coal/lignite in EU ETS may cause a boom of new coal power plants
- Ambitious EU GHG emission reduction target by 2020, envisages a German 40% emission reduction target by 2020



- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006). www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² Additional allowances can be generated optionally from "Forest Management" up to the amount of 4.5 Mt CO₂/y (Annex to decision 11/CP.7 in UNFCCC document FCCC/CP/2001/13/Add.1). This would represent 0.4% of the base year emissions. The projections are taken from the National Communication to UNFCCC "Fourth National Report by the Government of the Federal Republic of Germany 2006". GHG projection, including current policies. http://unfccc.int/resource/docs/natc/gernc4.pdf
- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
 ⁵ Difference between emissions in 2005 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance by 0.4 percentage points.
- ⁶ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁷ For the year 2005. Population in 2005 is based on United Nations World Population Prospectus (UN 2006).
- ⁸ For the year 2005. Gross Domestic Product is based on World Development Indicators (World Bank 2006), retrieved on 24 August 2006.
- ⁹ For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- ¹⁰ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹¹ This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹² For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹³ This has not been translated into formal national policy yet.



Climate scorecard: Italy

Greenhouse gas emissions¹ **Emission trends²** Past emission trend from +12.1% (MtCO₂eq.) 1990 to 2005 Current distance to the +18.6 600 Kyoto target⁵ %-points F-gases N2O 400 Increase of the share of 1.7% CH4 CO2 renewable energy sources⁶ 200 Forestry Projections 10 Emissions per capita⁷ tCO₂eq./cap 2000 2010 2015 2020 390 Emission per GDP8 tCO2eq./M\$ Emissions by sector³ 524 A griculture CO₂ per kWh electricity⁹ gCO₂/kWh Electricity and heat Energy efficiency in Households and 1.3 29% industry¹⁰ services 15% Emissions in transport per 2.3 capita 11 tCO₂eq./cap Transport Industry 23% Emissions in households 1.5 and services per capita 12 Energy sources⁴ tCO₂eq./cap Solar/Wind/Other Geothermal Biomass/Waste **Summary** 0.12% 3% Increasing emissions Nuclear Coal Far from reaching the Kyoto target 0.00% 8% Medium/low emission rates compared to Hydro industrialised countries 2% Strong dependence on oil, fast increasing share of Gas natural gas Oil 36% No use of nuclear power since 1987

Climate policies

General

- Ratified UNFCCC on 15.04.1994, ratified the Kyoto Protocol on 31.05.2002
- Supports that global temperature increase should be kept below 2°C
- Mixed public/private "Italian Carbon Fund" set up to provide certificates from CDM/JI projects
- Agreed to ambitious EU targets for 2020: unilaterally reduce GHG emissions 20% below 1990 and 30%, if other countries commit to similar efforts, save 20% energy consumed and increase renewables to a 20% share

Electricity/ nuclear	Participant in the EU Emission Trading Scheme. Tradable energy efficiency certificates (white certificates). Financial incentives for combined heat and power. Projected new coal power installations not compatible with present Kyoto targets. State aid to power plants jeopardises efficient policy in curbing CO ₂ emissions. No use of nuclear power.	-
Industry	Participant in the EU Emission Trading Scheme. Tradable energy efficiency certificates (white certificates) but need reform and new target to be consistent with Kyoto targets. Negotiated agreements. CO ₂ tax not weighted on real carbon content of energy sources.	- W
Households and services	Financial incentive for solar thermal installations and efficiency improvements in households. Mandatory standards for new buildings. Energy efficiency certification of building is in process but still not in place. Existing policies coherent with Kyoto target.	Service Control of the Control of th
Transport	Fragmented and ineffective policies. Voluntary agreement with automotive industry and a biofuels tax exemption, which was now transformed in green certificate obligation. EU commission decision on allocation (May 2007) has rejected all CO ₂ emission reduction from transport sector claimed by Italy as inconsistent with existing policy.	
Renewables	Renewable certificates and feed-in tariffs. Tax credit for geothermal energy and biomass. Ranked among the last in the EU report assessing progress towards renewable targets. Renewable incentive scheme hampered by administrative barriers.	1

- Emission rates are average / low for industrialized countries with relatively high but decreasing share of oil
- Emissions considerably above Kyoto target and projected to further increase substantially
- Only a few national measures in place that have reduced emissions
- Ambitious EU GHG emission reduction target by 2020



¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006), www.unfccc.int. The emissions

exclude "Land-Use Change & Forestry" and "International Bunker Fuels".

² Additional allowances can be generated optionally from "forest management" up to the amount of 10.2 Mt CO₂/y (Decision 8/CMP.2 in UNFCCC document FCCC/KP/CMP/2006/10/Add.1). This would represent 2% of the base year emissions. The projections are taken from the Progress Report to UNFCCC "ITALIAN REPORT ON DEMONSTRABLE PROGRESS UNDER ARTICLE 3.2 OF THE KYOTO PROTOCOL, 2006". GHG projection, including current policies. http://unfccc.int/resource/docs/dpr/ita1.pdf

- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO2 emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Difference between emissions in 2005 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance by 2 percentage points.
- ⁶ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁷ For the year 2005. Population in 2005 is based on United Nations World Population Prospectus (UN 2006).
- ⁸ For the year 2005. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.
- 9 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- ¹⁰ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹¹ This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹² For the year 2005. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.



Climate scorecard: Japan

Greenhouse gas emissions¹ **Emission trends²** Past emission trend from +8.0% 1990 to 20045 (MtCO₂eq.) 1600 Current distance to the +14.01400 Kyoto target⁶ %-points 1200 1000 F-gases Increase of the share of 0.0% N20 renewable energy sources⁷ 800 CH4 CO2 600 11 Emissions per capita⁸ 400 Kvoto target tCO₂eq./cap 200 Projections 394 0 Emission per GDP9 tCO2eq./M\$ -2001990 1995 2000 2005 2010 2015 Emissions by sector³ 441 CO₂ per kWh electricity¹⁰ A griculture 2% Waste 4% gCO₂/kWh Electricity and Households and Energy efficiency in heat 28% 1.1 services 14% industry¹¹ Emissions in transport per 2.0 capita 12 tCO₂eq./cap Transport 19% Industry 33% Emissions in households 1.5 and services per capita 13 tCO₂eq./cap Energy sources4 Geothermal Solar/Wind/Other **Summary** 0.62% 0.14% Increasing emissions from 1990 to 2004 Biomass/Waste Hydro Large distance to Kyoto target 1% Nuclear Relatively low emission rates compared to average Coal 12% of industrialised countries due to high efficiency and 21% use of nuclear power, which WWF does not consider Gas as viable policy Projections show stable emissions

Climate policies

General

- Ratified UNFCCC on 28.05.1993, ratified the Kyoto Protocol on 04.06.2002
- Government plans to achieve at least 1.6% of the 6% Kyoto target from JI and CDM and 3.8% from land-use change and forestry¹⁴

Electricity/ nuclear	Voluntary agreement with industry association; target -20% CO ₂ emissions per unit of output in 2010, but CO ₂ emissions of sector have been increasing. Strong support for nuclear power. Enhancing efficiency of household appliances through "top runner" standards and energy saving labels. Tax deduction for high-efficiency equipment (lighting, air conditioners) and subsidies for efficient water heaters.	× .
Industry	Voluntary agreement with industry association; target to reduce GHG emissions below 1990 level by 2010. Obligatory energy management system. Voluntary emission trading scheme with subsidies.	1
Households and services	Obligatory energy management system for commercial buildings. Tax credits for households to apply CHP.	- X
Transport	"Top runner" standards for vehicles and fuel economy labels. Obligatory energy management systems for emitters. Clean Vehicles programmes for highly efficient vehicles. Development of infrastructures (rail network).	
Renewables	R&D programmes and grants.	- X

- Relatively low emission rates compared to average of industrialized countries due to high efficiency and use of nuclear power, which WWF does not consider as viable policy
- Increasing emissions and large distance to Kyoto target
- No mandatory emission reduction scheme based on market mechanisms
- No 2020 or long-term greenhouse gas emission reduction targets



- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006). www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² Additional allowances can be generated optionally from "Forest Management" up to the amount of 48 Mt CO₂/y (Annex to decision 11/CP.7 in UNFCCC document FCCC/CP/2001/13/Add.1). This would represent 3.8% of the base year emissions. The projections are taken from the In-Depth Review Report of the UNFCCC "Report of the centralized in-depth review of the fourth national communication of Japan, 2007". GHG projection, including current policies. http://unfccc.int/resource/docs/2007/idr/jpn04.pdf
- For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ The Japanese government has not yet submitted the country's greenhouse gas inventory for 2005 to the UNFCCC.
- ⁶ Difference between emissions in 2004 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance by 3.9 percentage points.
- ⁷ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁸ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁹ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.
- For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹² This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹³ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹⁴ Ministry of Economy, Trade and Industry (2006): Japan's policies of the Kyoto Mechanisms



Climate scorecard: Russia

Greenhouse gas emissions¹ Emission trends² Past emission trend from -28.7% 1990 to 2005 (MtCO₂eq.) 3500 Current distance to the -28.7 3000 Kyoto target⁵ %-points 2500 2000 Increase of the share of -0.4% 1500 renewable energy sources⁶ 1000 15 orestrv 500 Emissions per capita⁷ Projections tCO₂eq./cap 1990 1995 2000 2005 2010 2015 2020 1629 Emission per GDP8 tCO2eq./M\$ Emissions by sector³ 329 A griculture Waste CO₂ per kWh electricity⁹ gCO₂/kWh Households and services Energy efficiency in 2.5 10% industry¹⁰ Transport Emissions in transport per 1.5 Electricity and heat capita 11 tCO₂eq./cap 57% Emissions in households 1.4 14% and services per capita 12 tCO2eq./cap Energy sources4 **Summary** Biomass/Waste Geothermal Decreasing emissions from 1990 to 1999 due to 0.04% Hydro 0.96% economic downturn, but now steadily increasing Solar/Wind/Other 2% 0.00% Projections showing large emission increase Coal Current emissions far below the Kyoto target Nuclear 6% Average emission rates in electricity production compared to industrialised countries due to large Oil Gas 21% 53% Low efficiency in industry and very high emissions per GDP

Climate po	licies	
General • Ratified L	JNFCCC on 25.03.1994, ratified the Kyoto Protocol on 18.11.2004	
Electricity/ nuclear	Programme to phase out subsidies to fossil based energy production. Energy efficiency programme was announced, but practically no concrete measures are implemented yet. Intends to increase reliance on nuclear power.	in the second
Industry	Programme to increase energy efficiency and improve gas based technologies and increase coal quality.	
Households and services	Very limited policies in the domestic sector.	
Transport	Plan to increase the share of biofuels, but no concrete measures.	

Summary evaluation

Renewables

 Emission rates are average for industrialized countries with high use of natural gas but low efficiency

Long-term plan to develop renewable energy.

- Emissions well below Kyoto target due to economic downturn, but currently steadily increasing
- · Hardly any national measures in place



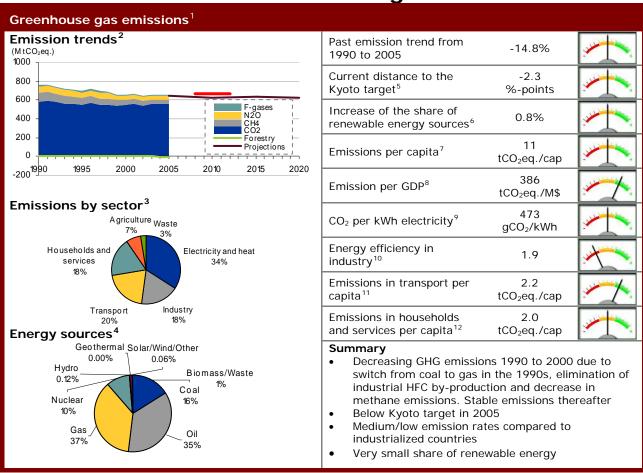
- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006). www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² Additional allowances can be generated optionally from "Forest Management" up to the amount of 121 Mt CO₂/y (Annex to decision 11/CP.7 in UNFCCC document FCCC/CP/2001/13/Add.1). This would represent 4% of the base year emissions. The projections are taken from the National Communication to UNFCCC "ЧЕТВЕРТОЕ НАЦИОНАЛЬНОЕ СООБЩЕНИЕ, 2006". GHG projection, including current policies. http://unfccc.int/resource/docs/natc/rusnc4r_rev.pdf
- ³ For the year 2005. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO2 emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Difference between emissions in 2005 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance by 4 percentage points.

 ⁶ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on
- IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- For the year 2005. Population in 2005 is based on United Nations World Population Prospectus (UN 2006).
- ⁸ For the year 2005. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.
- ⁹ For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- ¹⁰ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.

 11 This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹² For the year 2005. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.



Climate scorecard: United Kingdom



Climate policies

General

- Ratified UNFCCC on 08.12.1993, ratified the Kyoto Protocol on 31.05.2002
- Supports that global temperature increase should be kept below 2°C
- Long-term target to cut CO₂ emissions by 60% by 2050 compared to 1990 levels, consulting on new legislation (Climate Change Bill) to set emissions trajectory, strong national climate debate
- Agreed to ambitious EU targets for 2020: unilaterally reduce GHG emissions 20% below 1990 and 30%, if other countries commit to similar efforts, save 20% energy consumed and increase renewables to a 20% share
- Initiated debate on climate change within the G8, drives debate in international fora

Electricity/ nuclear	Participation in the EU Emission Trading System, but over-allocation of allowances in first phase; return to coal increased emissions since 2003. Commitment of electricity suppliers to increase energy efficiency in homes. Climate Change Levy with exemption for combined heat and power.	*
Industry	Participation in the EU Emission Trading System. Negotiated energy efficiency targets with industry-sector associations. Exemption from Climate Change Levy if negotiated agreement (Climate Change Agreement) is met.	
Households and services	Building standards for houses based on CO_2 emissions. Tax exemption for houses meeting zero carbon standards. Ambitious standards announced for 2007, which should reduce CO_2 emissions of new houses by 44% in 2013 and zero carbon in 2016.	
Transport	Biofuels tax exemption. Limited tax relief for low emission cars. Policy to increase road fuel taxation annually abandoned in 2001.	- X
Renewables	Obligation on electricity suppliers to supply percentage renewable energy, linked to tradable certificates. Exemption of renewable energy from Climate Change Levy. Renewable transport fuel obligation on fuel suppliers to start April 2008.	

- Emissions already below Kyoto target, also due to recent transition from coal to gas, but are stable since 2000 and are expected to rise further but UK will meet the Kyoto target. The voluntary national 2010 reductions target for CO₂ will be missed by 6-8%-points¹³
- Proactive in taking national measures, many additional measures in the pipeline, and driving the international debate.
- Has long-term target, but lower range of what is necessary for industrialized countries; ambitious EU GHG emission reduction target by 2020



- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006). www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² Additional allowances can be generated optionally from "Forest Management" up to the amount of 1.4 Mt CO₂/y (Annex to decision 11/CP.7 in UNFCCC document FCCC/CP/2001/13/Add.1). This would represent 0.2% of the base year emissions. The projections are taken from the In-Depth Review Report of the UNFCCC "Report of the centralized in-depth review of the fourth national communication of the United Kingdom of Great Britain and Northern Ireland". GHG projection, including current policies. http://unfccc.int/resource/docs/2007/idr/gbr04.pdf
- ³ For the year 2005. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Difference between emissions in 2005 and the Kyoto target. Additional allowances can be generated optionally from "Forest Management", which would lower the distance by 0.2 percentage points.
- ⁶ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁷ For the year 2005. Population in 2005 is based on United Nations World Population Prospectus (UN 2006).
- For the year 2005. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.
 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances,
- For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- ¹⁰ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹² For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹³ According to the UK government, CO₂ emissions will fall by 16% from 1990 levels by 2010 missing the target by 4%. But this assessment uses the cap for sectors covered by Emission Trading System. Actual emissions in the UK are likely to be a lot higher than capped emissions leading to our assessment of 6-8%.



Climate scorecard: United States

Greenhouse gas emissions¹ Emission trends² Past emission trend from +16.3% (MtCO₂eq.) 1990 to 2005 10000 Current distance to the +23.3 8000 Kyoto target⁵ %-points 6000 Increase of the share of F-gases N2O -0.7% renewable energy sources⁶ 4000 CH4 CO2 2000 24 Forestry Emissions per capita⁷ Projections tCO₂eq./cap -2000 19 90 2000 2005 1995 2010 2015 2020 661 Emission per GDP8 CO₂eq./M\$ Emissions by sector³ 575 A griculture Waste CO₂ per kWh electricity⁹ gCO₂/kWh Households and Energy efficiency in services 1.6 industry 10 Electricity and heat 12% 36% Emissions in transport per 6.4 capita 11 tCO2eq./cap Transport Emissions in households 2.9 Industry and services per capita 12 17% tCO2eq./cap Energy sources4 Geothermal Solar/Wind/Other Biomass/Waste Summary Very high emission rates per capita compared to average of industrialized countries Hydro Strong dependence on coal and oil 1% Coal Strongly increasing emissions 23% Nuclear Far from reaching the Kyoto target, which the USA 9% Gas did not ratify Oil Bush administration policy will continue the rise in 40% emissions

Climate policies

General

- Ratified UNFCCC on 15.10.1992, rejected the Kyoto Protocol
- Bush administration proposed an alternative national approach resulting in rising emissions.
- Bush administration states climate change is "a serious problem", but policies do not result in short-term emission reductions; 18% energy intensity reduction target to reduce 1,833 MtCO₂eq by 2012
- Regional greenhouse gas initiatives in several states (e.g. RGGI in the north-east, California etc.) plan to implement a multi-state cap-and-trade program with a market-based emissions trading system.
- Increased activity in the Congress on the issue of climate change¹³

Electricity/ nuclear	Development programme for future clean technologies. Programmes for increased building efficiency and energy saving appliances (Energy-Star label).	2
Industry	Voluntary partnerships between government and industry, NGOs and industry to reduce emissions. Climate Wise and Industry for the Future programmes.	1
Households and services	Mandatory, not very ambitious energy efficiency standards for new buildings.	*
Transport	Research and development grants for clean fuels and vehicle efficiency. Voluntary initiatives to reduce emissions between government and automotive industry.	*
Renewables	Tax incentives to residential solar systems. Renewable Portfolio Standards - minimum targets for renewable electricity - in many states for utilities, but no support mechanism on the federal level.	

- Country with the highest absolute emissions. Emission rates are among the highest in the world, strong dependence on coal and oil
- Kyoto target is out of reach, national targets are significantly less ambitious
- National strategy (climate technology R&D funds) aimed only at long-term emissions
- Strong pressure by local and state governments and some businesses to strengthen policies



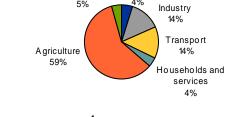
- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions are taken from UNFCCC (2006), www.unfccc.int. The emissions exclude "Land-Use Change & Forestry" and "International Bunker Fuels".
- ² The projections are taken from the World Energy Outlook 2005 of the International Energy Agency (IEA 2004) for CO₂ and USEPA (2006) Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 - 2020. Appendix A-D. for non-CO₂ gases.
- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Difference between emissions in 2004 and the Kyoto target.
- ⁶ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France, Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁸ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.
- 9 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- ¹⁰ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.

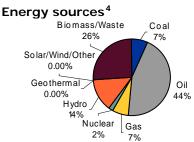
 11 This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹² For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹³ A list of bills about climate change under debate in the current congress is kept by the Pew Center: http://www.pewclimate.org/what_s_being_done/in_the_congress/110thcongress.cfm



Climate scorecard: Brazil

Greenhouse gas emissions¹ Emission trends² (MtCO₂eq.) 2500 CH4 CO2 2000 Forestry Projections 1500 1000 500 1995 1990 2000 2005 2010 2015 2020 Emissions by sector³ Electricity and heat Waste Industry 14%





Past emission trend from 1990 to 2004	+40.7%	
Increase of the share of renewable energy sources ⁵	-4.7%	
Emissions per capita ⁶	5 tCO₂eq./cap	
Emission per GDP ⁷	710 tCO₂eq./M\$	
CO ₂ per kWh electricity ⁸	78 gCO₂/kWh	
Energy efficiency in industry ⁹	1.6	
Emissions in transport per capita 10	0.7 tCO₂eq./cap	
Emissions in households and services per capita ¹¹	0.2 tCO₂eq./cap	
Access to electricity	95%	

Summary

- · Increasing emissions trend
- High emission rates per GDP
- Low emission rates per capita
- Low emission intensity for electricity generation due to large share of renewable energy sources (hydro) in fuel mix, WWF supports World Commission on Dams guidelines
- High (but decreasing) share of residential use of biomass in energy mix
- Emissions from deforestation (not included above) and agriculture are a large share of total greenhouse gas emissions

Climate policies

General

- Ratified the UNFCCC on 28.02. 1994, ratified the Kyoto Protocol on 23.08.2002
- 101 CDM projects currently registered with the UNFCCC (est. annual reduction: 14.4 MtCO₂eq.)¹²
- National Plan for Confronting Climate Change under development

 National 	Plan for Confronting Climate Change under development
Electricity	Promotion of natural gas import and the use of in cogeneration plants. National Program for Electricity Conservation (PROCEL) in place since 1991.
Industry	Energy performance standards are set for electric motors. National program for the rationalization of the use of oil and gas derivatives (CONPET) in place since 1991.
Households and services	Voluntary labelling for electric appliances and mandatory labelling for gas-power stoves and ovens. Tax reduction for efficient light bulbs.
Transport	Tax incentive for efficient car engines.
Renewables	National Alcohol Programme (Proalcool) to support the use of ethanol as substitute for petrol. Currently 25% ethanol share in all gasoline. The energy balance of Brazilian ethanol from sugarcane is very good compared to other options. Biodiesel program aimed at having 3% share of vegetable oil in diesel in 2008 and 5% in 2013. Incentives Program for Renewable Energy in the Electricity Sector (PROINFA) has a target of 3.300 MW of Renewable Energy distributed equally between wind, biomass and small hydroelectric plants.

- Very low emission intensity for electricity generation due to extensive use of hydropower
- Increasing national emissions
- Emissions from deforestation and agriculture account for a large share of total greenhouse gas emissions

- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions data for CO₂ are taken from IEA (2006) CO₂ Emissions from Fuel Combustion (2006 edition); process CO₂ emissions from cement production from CDIAC (2005) Global, Regional, and National Fossil Fuel CO₂ Emissions. In Marland, G., T.A. Boden and R. J. Andres (Eds.), A Compendium of Data on Global Change were added; data for non-CO2 gases according to USEPA (2006) Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990 - 2020. Appendix A-D; emissions from landuse change as published by Houghton in the WRI climate indicator analysis tool (Houghton 2003) Emissions (and Sinks) of Carbon from Land-Use Change.
- ² The projections are taken from the World Energy Outlook 2005 of the International Energy Agency (IEA 2004) for CO₂ and USEPA (2006) Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 – 2020. Appendix A-D. for non-CO₂ gases.
- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".
- ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France. ⁵ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data.
- WWF only supports hydropower that is consistent with World Commission on Dams guidelines. ⁶ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁷ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in
- purchasing power parity, retrieved on 24 August 2006.
- 8 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances, Paris, France.
- ⁹ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹⁰ This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹¹ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹² UNFCCC CDM project database as of 29 May 2007.



Climate scorecard: China

Greenhouse gas emissions¹ **Emission trends²** (M t C O₂ eq.) 8000 6000 4000 2000 Forestry Projections -2000 1990 2000 2005 2020 2010 2015 Emissions by sector³ Waste A griculture 3% Households and Electricity and heat services 40% 8% Transport 5% Industry 27% Energy sources4 Solar/Wind/Other Biomass/Waste Geothermal 0.00% Hydro Nuclear 0.79% Gas 3% Oil Coal 60%

	/	/
Past emission trend from 1990 to 2004	+72.7%	
Increase of the share of renewable energy sources ⁵	-6.7%	
Emissions per capita ⁶	5 tCO₂eq./cap	
Emission per GDP ⁷	896 tCO₂eq./M\$	
CO ₂ per kWh electricity ⁸	771 gCO₂/kWh	
Energy efficiency in industry ⁹	1.9	
Emissions in transport per capita 10	0.2 tCO₂eq./cap	
Emissions in households and services per capita ¹¹	0.4 tCO₂eq./cap	
Access to electricity	99%	

Summary

- Strongly increasing emissions
- Decreasing but still high emission rates per GDP (halved in the last 10 years)
- Low emission rates per capita
- High emission intensity for electricity generation due to extensive use of coal
- High (but decreasing) share of residential use of biomass in energy mix

Climate policies

General

- Ratified the UNFCCC on 05.01.1993, ratified the Kyoto Protocol on 30.08.2002
- 84 CDM projects currently registered with the UNFCCC (est. annual reduction: 65 MtCO2eq.)12
- Ambitious energy intensity target: -20% primary energy per GDP from 2005 to 2010.

Electricity	Electric Power Law was promulgated in 1995 to start a market-oriented electricity power system reform; incentive to substitute coal by natural gas through provision of improved infrastructure for natural gas.
Industry	Efforts to reduce consumption of energy and other resources.
Households and services	Mandatory standards for energy-efficiency of appliances together with a voluntary labelling program.
Transport	Establishment of the energy-efficient integrated transportation system; standards to limit energy consumption of cars.
Renewables	Commitment to use 12% electricity and 17% of total energy from renewable sources by 2020. Adopted renewable energy law to take effect in 2006 with feed in tariff, a national fund, discounted lending and tax preferences for renewable energy projects.

- Emissions per capita at developing country average, low compared to world average, but strongly increasing total emissions
- Strong dependence on coal in electricity generation and industry, but efforts to broaden the use of natural gas
- The fast development of the energy system includes efforts to increase the share of renewable sources and implement energy efficiency measures

- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions data for CO₂ are taken from IEA (2006) CO₂ Emissions from Fuel Combustion (2006 edition); process CO₂ emissions from cement production from CDIAC (2005) Global, Regional, and National Fossil Fuel CO₂ Emissions. In Marland, G., T.A. Boden and R. J. Andres (Eds.), A Compendium of Data on Global Change were added; data for non-CO2 gases according to USEPA (2006) Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990 - 2020. Appendix A-D; emissions from landuse change as published by Houghton in the WRI climate indicator analysis tool (Houghton 2003) Emissions (and Sinks) of Carbon from Land-Use Change.
- ² The projections are taken from the World Energy Outlook 2005 of the International Energy Agency (IEA 2004) for CO₂ and USEPA (2006) Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 – 2020. Appendix A-D. for non-CO₂ gases.
- For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".

 ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁶ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁷ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.

 8 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances,
- Paris, France.
- ⁹ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹¹ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹² UNFCCC CDM project database as of 29 May 2007.



Climate scorecard: India

Greenhouse gas emissions¹ Emission trends² Past emission trend from +57.5% 1990 to 2004 $(MtCO_2eq.)$ Increase of the share of -10.4% 2500 renewable energy sources⁵ 2000 2 Emissions per capita6 1500 tCO₂eq./cap 1000 560 Emission per GDP7 500 tCO₂eq./M\$ Projections 912 CO₂ per kWh electricity⁸ gCO₂/kWh -5001990 2000 2005 2010 2015 Energy efficiency in Emissions by sector³ 1.7 industry9 Emissions in transport per 0.1 capita 10 tCO2eq./cap A griculture Emissions in households 0.1 23% Electricity and heat and services per capita11 tCO2eq./cap 40% Access to electricity 43% Households and services Industry Summary 8% Transport Strongly increasing emissions Energy sources⁴ High emission rates per GDP Very low emission rates per capita Coal Biomass/Waste Very high emission intensity for electricity 38% generation due to large share of coal Very high (but decreasing) share of residential use Solar/Wind/Other 0.06% of biomass in energy mix High share of methane emissions from agriculture Geothermal (rice fields and animals) Gas Hydro 0.00% Oil Nuclear 4% 1% 22% 0.84%

Clima		

General

- Ratified the UNFCCC on 01.11.1993, ratified the Kyoto Protocol on 26.08.2002
- 241 CDM projects currently registered with the UNFCCC (est. annual reduction: 22 MtCO₂eq.)¹²

241 CDIV	projects currently registered with the old coo (est. annual reduction, 22 witeo2eq.)
Electricity	Clean coal initiatives to restructure the coal sector, including reduced subsidies.
Industry	Clean coal initiatives to restructure the coal sector, including reduced subsidies. Companies are obliged to report energy efficiency improvements to facilitate identification of existing potentials.
Households and services	Public investment for development of a natural gas infrastructure.
Transport	Reduction of vehicle emissions through measures like required performance standards or obligatory use of compressed natural gas as fuel.
Renewables	Renewable energy programme including subsidies for renewable technologies.

- Emissions per capita are well below developing country average, but strongly increasing absolute emissions
- · Strong dependence on coal, some efforts underway to increase the share of renewables
- Some efforts made to slow emission growth
- Large number of people still without access to modern energy

- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions data for CO₂ are taken from IEA (2006) CO₂ Emissions from Fuel Combustion (2006 edition); process CO₂ emissions from cement production from CDIAC (2005) Global, Regional, and National Fossil Fuel CO₂ Emissions. In Marland, G., T.A. Boden and R. J. Andres (Eds.), A Compendium of Data on Global Change were added; data for non-CO2 gases according to USEPA (2006) Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990 - 2020. Appendix A-D; emissions from landuse change as published by Houghton in the WRI climate indicator analysis tool (Houghton 2003) Emissions (and Sinks) of Carbon from Land-Use Change.
- ² The projections are taken from the World Energy Outlook 2005 of the International Energy Agency (IEA 2004) for CO₂ and USEPA (2006) Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 – 2020. Appendix A-D. for non-CO₂ gases.
- For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".

 ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁶ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁷ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.

 8 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances,
- Paris, France.
- ⁹ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹⁰ This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹¹ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹² UNFCCC CDM project database as of 29 May 2007.



Climate scorecard: Mexico

Greenhouse gas emissions¹ Emission trends² Past emission trend from +38.6% 1990 to 2004 (M t C O₂ eq.) 1600 \ Increase of the share of 1400 -1.4% renewable energy sources⁵ 1200 1000 5 Emissions per capita6 800 tCO₂eq./cap 600 556 400 Emission per GDP7 Forestry Projections tCO₂eq./M\$ 200 576 CO₂ per kWh electricity⁸ gCO₂/kWh 1990 1995 2000 2005 2020 2010 2015 Energy efficiency in Emissions by sector³ 1.7 industry9 A griculture Waste Emissions in transport per 1.3 capita 10 tCO₂eq./cap Households and Emissions in households 0.3 services and services per capita11 tCO2eq./cap 7% Electricity and heat Access to electricity 95% Transport 26% Industry Summary Low emissions per capita Energy sources⁴ Increasing emissions High emission growth projected for 2010 and after Biomass/Waste Solar/Wind/Other Strong dependence on oil Geothermal 0.04% Coal Hydro Nuclear 2% Gas Oil 57%

Climate policies

General

- Ratified the UNFCCC on 11.03.1993, ratified the Kyoto Protocol on 07.09.2000
- 79 CDM projects currently registered with the UNFCCC (est. annual reduction: 5.9 MtCO₂eq.)¹²

Electricity	Programme to reduce leakages of gas.
Industry	Programme for energy saving and fuel switch of the National Mexican Petroleum Company (PEMEX). Development of integrated system of industrial regulation and management (SIRG) as well as registration of emissions and pollution transfer (RETC).
Households and services	Up to date energy efficiency standards are present for electric appliances, gas boilers and thermal insulations. Fiscal incentives, investment subsidies and soft loans for energy-efficiency improvement in services and households. Enhancing natural gas use by opening gas transport and distribution to private sector.
Transport	Pilot project for the use of hybrid buses in public transport. Fiscal incentives, investment subsidies and soft loans for energy-efficiency improvement.
Renewables	

- Emissions per capita average for developing countries, low compared to world average, but increasing and projected to increase faster in the future
- Strong dependence on oil
- First efforts to slow emission growth

- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions data for CO₂ are taken from IEA (2006) CO₂ Emissions from Fuel Combustion (2006 edition); process CO₂ emissions from cement production from CDIAC (2005) Global, Regional, and National Fossil Fuel CO₂ Emissions. In Marland, G., T.A. Boden and R. J. Andres (Eds.), A Compendium of Data on Global Change were added; data for non-CO2 gases according to USEPA (2006) Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990 - 2020. Appendix A-D; emissions from landuse change as published by Houghton in the WRI climate indicator analysis tool (Houghton 2003) Emissions (and Sinks) of Carbon from Land-Use Change.
- ² The projections are taken from the World Energy Outlook 2005 of the International Energy Agency (IEA 2004) for CO₂ and USEPA (2006) Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 – 2020. Appendix A-D. for non-CO₂ gases.
- For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".

 ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁶ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁷ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.

 8 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances,
- Paris, France.
- ⁹ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹⁰ This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹¹ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹² UNFCCC CDM project database as of 29 May 2007.



Climate scorecard: South Africa

Greenhouse gas emissions¹ Emission trends² Past emission trend from +29.7% 1990 to 2004 $(MtCO_2eq.)$ Increase of the share of 800 -0.3% renewable energy sources⁵ 700 600 11 500 Emissions per capita6 tCO₂eq./cap 400 300 1079 Emission per GDP7 200 tCO₂eq./M\$ Projections 100 853 CO₂ per kWh electricity⁸ gCO₂/kWh 2000 1990 1995 2005 2010 2015 2020 Energy efficiency in Emissions by sector³ 2.5 industry9 A griculture Waste Emissions in transport per 0.9 capita 10 tCO2eq./cap Households and services Emissions in households 0.6 and services per capita11 tCO2eq./cap 5% Transport Access to electricity 66% 8% Electricity and heat Industr 60% 15% Summary Energy sources4 Very large share of coal in energy mix Biomass/Waste High emission intensity for electricity generation due Hydro 11% Geothermal to large share of coal 0.14% 0.00% Solar/Wind/Other Very high emission rate per GDP Nuclear 0.00% Low emissions per capita compared to industrialized 3% countries, but high for developing countries Gas 2% Oil Increasing emissions 10% Coal 74%

Climate policies

General

- Ratified the UNFCCC on 28.08.1997, ratified the Kyoto Protocol on 31.07.2002
- 10 CDM projects currently registered with the UNFCCC (est. annual reduction: 2 MtCO₂eq.) 12
- Proactive in the international negotiations

Treatment in the international negetiations						
Electricity	Energy efficiency strategy for energy production sectors. Legal and economical framework development for future substitution of coal-based fuel by natural gas, e.g. the Gas Act.					
Industry						
Households and services	Planned energy efficiency standard for buildings and appliances.					
Transport	Planned efficiency label for motor vehicles and planned fiscal incentives for transport fuel efficiency.					
Renewables	Renewable energy target of 10,000 GWh by 2013 (4% of projected electricity generation). Capital subsidies for renewable energy technologies. White papers on renewable energy and energy policy. Off-grid electrification programme (PV).					

- Emissions per capita only slightly below average of industrialized countries, increasing trend
- Very strong dependence on coal
- First intentions to lower emissions in the future, proactive in the international negotiations
- Approximately 44% of people without access to modern energy

- ¹ Unless otherwise specified, emissions refer to greenhouse gas emissions from CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ in Mt CO₂ equivalent. The emissions data for CO₂ are taken from IEA (2006) CO₂ Emissions from Fuel Combustion (2006 edition); process CO₂ emissions from cement production from CDIAC (2005) Global, Regional, and National Fossil Fuel CO₂ Emissions. In Marland, G., T.A. Boden and R. J. Andres (Eds.), A Compendium of Data on Global Change were added; data for non-CO2 gases according to USEPA (2006) Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990 - 2020. Appendix A-D; emissions from landuse change as published by Houghton in the WRI climate indicator analysis tool (Houghton 2003) Emissions (and Sinks) of Carbon from Land-Use Change.
- ² The projections are taken from the World Energy Outlook 2005 of the International Energy Agency (IEA 2004) for CO₂ and USEPA (2006) Global Anthropogenic Non-CO₂ Greenhouse Gas Emissions: 1990 – 2020. Appendix A-D. for non-CO₂ gases.
- ³ For the year 2004. "Industry" includes energy, process and fugitive emissions but excludes emissions from electricity generation. "Households and services" also excludes emissions from electricity generation. "Agriculture" includes only non-CO₂ emissions. Emissions are excluding "Land-Use Change & Forestry".

 ⁴ For the year 2004. Total primary energy supply as provided by IEA (2006) Energy Balances, Paris, France.
- ⁵ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 based on IEA (2006) Energy Balances, Paris, France. Includes also large hydro, due to lack of disaggregated data. WWF only supports hydropower that is consistent with World Commission on Dams guidelines.
- ⁶ For the year 2004. Population in 2004 is based on United Nations World Population Prospectus (UN 2006).
- ⁷ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.

 8 For the year 2004. Based on IEA (2006) CO₂ emissions from fuel combustion and IEA (2006) Energy Balances,
- Paris, France.
- ⁹ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology.
- ¹⁰ This indicator can be positive if the efficiency of vehicles is high and/or the total travel activity is low.
- ¹¹ For the year 2004. Includes only direct emissions (e.g. from space heating) and excludes indirect emissions from electricity use.
- ¹² UNFCCC CDM project database as of 29 May 2007.

Summary table for the G8 countries¹⁶

		Middle position ¹	USA	Canada	Russia	Italy	Japan	UK	France	Germany
Past: Improvements 33% ²	Past emission trend from 1990 to 2005 ³	-12% ⁴	when the same of t		***	*	-		Service of the servic	
	Current distance to the Kyoto target ⁵	0%-points ⁶				- X-	-X-		Samuel Control	
	Increase of the share of renewable energy sources ⁷	1.7%8	2						- A	
	Emissions per capita	11.2 tCO₂eq/cap ¹⁰			- N					
Current: Status 33% °	Emission per GDP	602 tCO ₂ eq/M\$ ¹¹	· Service of the serv						· ·	*
Curr Sta	CO ₂ per kWh electricity ¹²	448 g/kWh ¹³	- White						July 1	
	Energy efficiency in industry ¹⁴	1.3	J. J. Company		-		× ×		· ·	
	Electricity/nuclear		- Land							- X
(0.10	Industry		- N				-		Samuel Control	
Future: Policies 34% 15	Households and services		S. A. C.				1		· ·	-
	Transport		- Aller					- X	White the same of	1
	Renewables		-		-		*			-
Summary evaluation		W. Company		- N				July 1		
Aggregated indices			-1.24	-1.12	-0.94	-0.38	-0.22	0.00	0.04	0.10

¹⁶ The scores (between -2.5 to 2.5) for each numerical indicator, each policy field and the summary climate performance are translated into graphical meters.



-2.5 to -1.5





-1.5 to -0.5



-0.5 to 0.5



0.5 to 1.5



1.5 to 2.5

The individual numerical scores are added up using the aggregation method described on page 7, resulting in an overall numerical score that is given below the summary evaluation meter.

¹ Value that defines the middle of the climate meter. Minimum and maximum are defined as minimum and maximum over industrialized countries.

² Past emission trend, distance to Kyoto target and increase in share of renewables are equally weighted at 11%.

³ Past emission trend in the period 1990 to 2005, for Canada and Japan from 1990 to 2004.

⁴ Upper and lower values are the extremes for industrialised countries. Middle value is chosen so that any increase is rated red (-2.5 to -0.5). Middle position would be more stringent (-20%) if the value of 2005 of a linear interpolation for an 80% reduction form 1990 to 2050 were chosen, which would be a consistent path towards 2°C.

⁵ Difference between emissions in most recent year available and the Kyoto target as percentage of emissions in 1990.

⁶ Middle value is set a 0 percentage points.

⁷ Change in share of renewable energy sources in primary energy consumption from 1990 to 2004 in percentage points. Includes also large-scale hydro.

⁸ For the year 2004 as provided by IEA (2006) Energy Balances, Paris, France. As increase in percentage of total primary energy supply in 2004. Extreme values are the maximum and minimum of industrialised countries. Middle value is chosen so that any decrease in share is rated red (-2.5 to -0.5).

⁹ Emissions per capita and emissions per GDP are weighted at 11%; CO₂ per kWh electricity and energy efficiency in industry are weighted at 5.5% each.

¹⁰ For the year 2005. Based in emission inventories submitted to the UNFCCC. Middle position is chosen as the value of 2005 of a linear interpolation between the Annex I average in 1990 (14 tCO₂eq.) and a 80% reduction in 2050.

¹¹ For the year 2004. Gross Domestic Product is based on World Development Indicators (World Bank 2006), in purchasing power parity, retrieved on 24 August 2006.

¹² For France the climate meter has been adapted from green to medium to reflect the relatively large share of nuclear power in the fuel mix.

¹³ For the year 2004. IEA (2006) CO₂ emissions from fuel combustion.

¹⁴ Energy efficiency index aggregated for iron & steel, pulp & paper, cement, petrochemical industry and petroleum refineries as provided by Kuramochi 2006. An indicator of 1 denotes best available technology. A value of 1.2 shows that the country is using 20% more energy than best available technology. Lower limit (red) is 2.8, the highest value for industrialised countries. Middle value is chosen as 1.3 as an achievable value which is still 30% above best available technology. Higher limit (green) is set at 1, best available technology.

¹⁵ Policies in the area of renewables are weighted at 8% for all countries. Electricity, industry, households and services and transport are weighted differently for each country according to their contribution to greenhouse gas emissions in each country. This means, very good policies in a sector with a high amount of greenhouse gas emissions are valued more than very good policies in a sector that does not contribute much to emissions.

Summary evaluation

The scoring, based on the ten indicators, demonstrates that none of the G8 countries are implementing enough measures to be considered in line with the 2°C limit (see summary table page 34). Given the urgency of the climate challenge, the G8 countries collectively still have a long way to go. Some countries have underlined their intent to move ahead globally by doing their fair share, through setting mid-term targets for 2020 (e.g. the EU member states). The other G8 countries – Russia, Japan, Canada and the US – have so far put few objectives and policies in place that show they are taking the challenge seriously.

Three countries have failed the test: USA, Canada and Russia

- The United States score the worst of all G8 countries, being the largest emitter with the highest per capita emissions and an increasing trend. At the same time the US have not ratified the Kyoto Protocol and have not put any substantive federal measures in place to curb emissions in the short term.
- Second on the list is Canada with a similar situation: very high per capita emissions, a steadily increasing trend, far away from its Kyoto target, inadequate mid to long-term GHG targets, and no comprehensive policy in place to curb emissions so that Kyoto target will stay out of reach.
- Russia ranks a bit better due to declining emissions in the early 1990's and a large share of less CO₂-intensive natural gas. But since 1999 emissions increase steadily and there is hardly any policy in place to curb emissions.

Lower medium rank countries Italy and Japan have made some efforts but are still far away from making an adequate contribution to staying below 2°C:

- Italy's emissions increase steadily and are considerably above the Kyoto target. Italy
 has started some efforts, but only a few national measures are yet in place that have
 reduced emissions. As an EU member state Italy though supports the EU greenhouse
 gas emission reduction targets for 2020, as well as the EU energy saving and
 renewables targets.
- Japan has relatively low emission rates compared to the average of industrialized countries due to high efficiency and use of nuclear power, which WWF does not consider as viable policy. But emissions are increasing and no mandatory emission reduction scheme based on market mechanisms exists, nor any national mid- to longterm targets.

The three countries furthest along this track are UK, France and Germany, but each is likely to see increases in emissions if further measures are not implemented soon:

- UK's emissions are already below the Kyoto target, also due to recent transition from coal to gas. But emissions are stable since 2000, the share of coal has again increased and emissions are expected to rise further. As part of the national Climate Change Bill and a strong national climate debate, further measures and objectives are being discussed or are in the pipeline for implementation.
- Emission rates in France are low for industrialized countries due to a high share of nuclear energy, which WWF does not consider as viable policy. Emissions have been roughly stable since 1990. The ambitious long-term target still needs to be implemented.
- Germany's emissions declined 1990 to 2000 partly due to economic downturn in
 Eastern Germany but also due to national measures. Since then, emissions are stable
 and a gap to meet the Kyoto target is expected, if no immediate measures are put in
 place or external credits purchased. Germany is successful with its promotion of new
 renewable energy sources, but less ambitious for electricity production from fossil
 fuels facing a high share of coal and lignite. Currently there is a strong national
 climate debate about further measures.
- As EU member states all three support the EU greenhouse gas emission reduction targets for 2020, as well as EU energy saving and renewables targets, which though still need to be applied to national level.

A number of initiatives are already underway in major developing countries (Brazil, China, India, Mexico and South Africa). These five countries are expecting large growth of emissions in the future. They differ substantially in their state of development, energy mix and resulting emissions. The question remains how G8 countries will assist them in developing in a less carbon intensive manner.

Further reading

- Fact sheets: Fact sheets for 60 countries with more detailed data but without ranking are available in the Ecofys report "factors underpinning future action" funded by UK DEFRA, http://www.fiacc.net/data/fufa2.pdf
- Official national emission estimates reported to the UNFCCC: Greenhouse gas inventory data of the UNFCCC secretariat, available at http://ghg.unfccc.int/index.html
- Compilation of national greenhouse gas emissions and other climate relevant data: Climate Analysis Indicators Tool (CAIT) by the World Resources Institute, available at http://cait.wri.org
- Emission trends in EU countries: European Environment Agency's European Topic Centre for Air and Climate Change, 2006: "Greenhouse gas emission trends and projections in Europe 2006", EEA Report No 5/2004, available at http://reports.eea.europa.eu/eea_report_2006_9/en
- Annex I emission fact sheets: Malte Meinshausen, 2004: "Emissions, Targets and Projections for Annex I Parties", revised version of data appendix in F. Yamin and J. Depledge, "The International Climate Change Regime: A Guide to Rules, Institutions, and Procedures", Cambridge University Press, 2004, available at http://www.simcap.org

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