

# Climatico



## **Policy Monitor Report 2013**

Climatico Analysis, February 2013

## About Climatico

Climatico is an independent network of researchers and climate change experts that analyze and report on the latest developments in climate change policy around the world. The group assesses government policies addressing mitigation and adaptation to climate change, including the underlying rationale and drivers of action and non-action. In addition, Climatico focuses on the most important international issues under discussion at high-level climate policy forums and venues (G8, UNFCCC, G-20, etc.) by monitoring policy trends and developments regarding such topics as adaptation, capacity building, technology transfer, CDM, JI, emissions trading, finance, and emissions targets.

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# Contents

- Introduction** .....4
- G8 Countries**.....5
  - Canada .....5
  - European Union.....7
    - France .....9
    - Germany ..... 11
    - Italy ..... 13
    - United Kingdom ..... 15
  - Japan..... 17
  - Russian Federation ..... 19
  - United States ..... 21
- +5 Emerging Economies** ..... 23
  - Brazil ..... 23
  - China ..... 25
  - India ..... 26
  - Mexico ..... 28
  - South Africa ..... 30
- References ..... 32

## Introduction

This report serves to create a summary of national climate change policies and policy initiatives of the G8 plus five countries. We focus on the G8+5 countries due to the important role these nations have played in the climate change dialogue. In addition, this report includes the European Union as a whole as it negotiates as a bloc and includes 4 of the G8 nations.

Climatico reviews in schematic format the most important policy initiatives that govern the following major issue areas in relation to climate change:

- **Climate change policies and legislation:** this more general topic area covers the overarching management of climate change in a specific country. More specifically, indicators that will be monitored include the signing of international agreements, setting of emissions reduction targets and their fulfillment, and respective implementation strategies and mechanisms, such as the introduction of carbon markets, carbon taxes or similar. The long-term aim is the fulfilment of stated emission reduction goals, which in some countries could also be the decoupling of emission targets from economic growth.
- **Clean energy generation (energy supply side):** this topic area monitors the development and implementation of policies and strategies to make energy generation, such as electricity and liquid fuels, cleaner. Strategies include: replacing carbon-based sources of energy with renewable sources, cleaner technologies for carbon-based fuels, carbon sequestration and storage, the development of clean and renewable alternatives including waste to energy technologies and the sustainable capturing and use of methane.
- **Efficient energy consumption (energy demand side):** this topic area considers efficient consumption of energy (fuels and electricity). Depending on the country, sub-topics that will be monitored include transport policies, energy efficiency of households, the private and public sector, and the housing sector. . The long-term goal is a decrease in the growth of per capita energy consumption and a decoupling of economic growth and energy consumption.
- **Land Use and Forestry (LULUCF and REDD):** this topic area takes the carbon storage capacity of forests and vegetation into consideration and therefore monitors forestry and land use policies in respective countries. Key elements under consideration are policies to protect forests and promote sustainable forest management, reforestation programmes and actions against illegal logging.

### Report functionality

We provide a summary of policies in this report, not a critique or analysis of those policies or their implementation. While we have tried to be as thorough as possible in our research, this report is not all-inclusive. A list of policies will be added to our website ([www.climaticoanalysis.org](http://www.climaticoanalysis.org)) which will be updated as policies are added or replaced. We attempt to provide you with the most relevant information up through late-2012 to provide readers with a base from which to start from for their research of country policies and positions. References and links are included where possible, and amendments or updates are welcome and may be sent to: [press@climaticoanalysis.org](mailto:press@climaticoanalysis.org).

## G8 Countries

Canada, European Union<sup>1</sup> (France, Germany, Italy, United Kingdom), Japan, Russia, United States

### Canada

#### Climate Change Policy

<b>Position</b>	Canada withdrew from the <a href="#">Kyoto Protocol</a> in 2011, considering the economic burden of meeting its established target as too costly and the Protocol to be ineffective, as the two major emitters (the US and China) did not form part of the agreement. Instead, Canada supports the work towards an international climate change agreement building upon the <a href="#">Cancún Agreements</a> and the <a href="#">Durban Platform</a> . At COP18, Canada stressed its compliance with the <a href="#">Copenhagen Accord</a> and reiterated its support for a new international treaty to be implemented by 2020 that includes all major emitters.
<b>Status</b>	Until its withdrawal, Canada was an Annex I nation and subject to the commitments made under the Kyoto Protocol. Canada has signed on to the Copenhagen Accord.
<b>2012 Target</b>	Given Canada's withdrawal from the Kyoto Protocol, its original target to cut GHG emissions by 6% by 2012 (base year: 1990) is now obsolete.
<b>Long-term Target</b>	According to the Copenhagen Accord, Canada is committed to a 17% GHG emission reduction (base year: 2005) by 2020, equivalent to emissions of 607 Megatons (Mt). This target is aligned to the target and baseline of the United States and is subject to adjustment in accordance with US target adjustments. In 2012, estimations projected emissions to reach 720 Mt by 2020.
<b>Strategy to curb emissions</b>	Given economic integration with the US, Canada's climate policy is aligned with the climate policy of its neighbor. Focus has been on introducing greenhouse gas regulations in major emitting sectors (transportation and power generation) and to regulate renewable content in fuels. To achieve its greenhouse gas emission target, Canada is expanding its work to other sectors, particularly oil and gas.

#### Clean & renewable energy generation

<b>Major GHG emission issues</b>	In 2010, the fossil fuel industry (oil and gas) accounted for 22% of Canada's GHG emissions, while electricity generation accounted for 14% - the former being responsible for almost half of the increase in GHG emissions between 1990 and 2010. Due to a rise in fossil fuel-based electricity generation in the overall electricity mix, emissions from electricity generation grew along with the rise in electricity demand. Increasing shares of alternative sources of energy, such as natural gas and wind power, are contributing to reverse this trend.
<b>Strategy to curb emissions</b>	In order to produce cleaner electricity, Canada introduced regulations to reduce emissions from coal-fired electricity generation and announced investment of \$281 million to support the development of clean energy technologies. With respect to transport fuels, it introduced a 5% renewable fuel content requirement for gasoline in 2010.

#### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	Transport contributed to 28% of overall GHG emissions in 2010 and was responsible for almost half of the rise in GHG emissions between 2002 and 2010. This rise in emissions was not only due to an overall increase in vehicle fleet but also to a shift in consumer preferences from cars to trucks. While emissions from residential buildings have been falling due to government schemes to incentivize energy efficiency in buildings, emissions from commercial buildings have been on the rise resulting in a combined increase of emissions of 7.5% in these two sectors.
<b>Strategy to curb emissions</b>	Canada committed investments in research and technology application to help reduce greenhouse gases from building construction and to improve energy efficiency in buildings and industry. In addition, Canada finalized regulations to reduce GHG emissions from passenger cars and light trucks and proposed regulations to achieve GHG reductions from heavy duty vehicles.

<sup>1</sup>The European Union negotiates as a bloc and is therefore included here along with its respective G8 nations.

## REDD/LULUCF

<b>Major issues in the forestry or agricultural sector</b>	Emissions from Land Use, Land Use Change and the Forestry Sector accounted for 72Mt in 2010 (with large annual variability) and, if added to the national GHG emissions, would increase the total by 10% (national accounting excludes LULUCF). GHG emissions of the forestry sector are determined and fluctuate with the extent of forest fires and the degree of Mountain Pine Beetle infestations. Major drivers of land conversion are agriculture (accounting for 45% of land conversion), resource extraction (oil and gas) and hydro-electrical development.
<b>Strategy to curb emissions</b>	To promote sustainable forestry, Canada continues to promote third-party forest certification. In 2011, 40% of the world's certified forests were located in Canada. At the international level, Canada joined the REDD+ partnership in 2010 and channeled \$40 million towards the World Bank's Forest Carbon Partnership Facility Readiness Fund.

## European Union

### Climate Change Policy

<b>Position</b>	In Durban, the EU stressed the urgency to close the gap between current pledges and the goal to limit global warming to 2°C. In addition, it reiterated its willingness to commit to a 30% reduction in GHG emissions by 2020, provided ambitious commitments from all major economies. It offered to take a second commitment period of the Kyoto Protocol given that all major emitters enter a legally binding framework after that time. At COP18, the EU pleaded to move beyond a two-tier system to a unified system in which all nations commit and contribute from 2020 onwards. It stressed its commitment to meet its 20% reduction target by 2020.
<b>Status</b>	Although each member state has its own national emission reduction targets, the EU as bloc sets a joint target, which was submitted to the UNFCCC in line with the Copenhagen Accord.
<b>2012 Target</b>	Under the Kyoto Protocol, the 15 EU states that were EU members at the time the Kyoto Protocol was signed committed to reducing emissions to 8% below 1990 levels by 2012. According to the latest Annual Progress Report, GHG emissions of the EU-15 were 14% below 1990 levels and emissions of the EU-27 were 18% below 1990 levels in 2011.
<b>Long-term Target</b>	For 2020, the EU set an emissions reduction target of 20% below 1990 levels across its 27 member states. It has offered a 30% reduction if other major economies commit to similarly ambitious emissions reduction targets.
<b>Strategy to curb emissions</b>	Through the <a href="#">Directorate-General for Climate Action</a> (DG Climate), established in 2010, the EU develops and implements international and domestic climate policies and strategies which include: <ul style="list-style-type: none"><li>• The implementation of the <a href="#">EU Emissions Trading System</a> (EU ETS) – which started to include airlines in 2012 – and the promotion of links with other carbon trading schemes to build an international market. As of 2013, an auction process will be the main allocation method for emissions allowances.</li><li>• The monitoring of member state’s emissions reduction targets in sectors outside the EU ETS.</li><li>• The promotion of low carbon technologies through cost effective regulatory frameworks and financial support schemes.</li></ul>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	The energy sector accounts for 80% of total EU GHG emissions, within which, public electricity and heat production accounted for about 28% in 2010. Emissions of energy industries (public electricity and heat production, petroleum refining, manufacture of solid fuels) vary widely across member states, mainly determined by the fuel mix. Across the EU-15, Germany’s energy industry accounts for 33% of EU emissions, followed by the UK (18%) and Italy (12.5%).
<b>Strategy to curb emissions</b>	<p>The <a href="#">EU Climate and Energy Package</a> sets the target to raise the share of energy consumption generated by renewable sources to 20% by 2020. This target is to be achieved through the Renewable Energy Directive under which member states are committed to binding national targets to raise the share of renewable energy in their energy mix.</p> <p>While originally the <a href="#">Renewable Energy Directive</a> set a target to raise the share of biofuels in the transport sector, this target was reduced to 5% in 2012 to limit the conversion of land for biofuel production and thus to increase the climate benefits of biofuels.</p> <p>Additionally, a directive to create a legal framework for the safe usage of Carbon Capture and Storage is being developed for carbon capture in geological formations.</p>

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	Road transportation accounted for 21% of total EU CO <sub>2</sub> emissions in 2010 and increased by 15.6% between 1990 and 2010. Road transport alone accounts for about one-fifth of total EU emissions and increased by 36% between 1990 and 2010.
	Emissions from industry and construction constitute the fourth largest source of GHG in the EU and

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accounted for 13% of total EU GHG emissions in 2010. Importantly, emissions declined by 23% between 1990 and 2010 in part due to a shift from solid fuels to natural gas and increased use of biomass and other fuels.

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**Strategy to curb emissions**

In 2012, the EU adopted the [Energy Efficiency Directive](#) which establishes a common framework in order to remove barriers and cut its primary annual energy consumption by 20% by 2020. In the transport sector, measures include the inclusion of aviation in the EU Emissions Trading System, a target to reduce the emissions intensity of transport fuels, labeling of rolling resistance limits and mandatory tyre pressure monitors, and a strategy to reduce emissions from vehicles.

## REDD/LULUCF

**Major issues in the forestry or agricultural sector**

The regulation of forest issues is in the domain of each member state. However, being the second-largest producer of industrial round timber after the US and producing approximately 80% of the world's cork, the EU has set objectives to improve the sustainability of its forest industry. Furthermore, the EU acts with regards to deforestation in other developing countries, particularly as around 19% of wood products imported into the EU come from illegal logging.

**Strategy to curb emissions**

Domestically, the EU is striving for harmonized EU-wide emission accounting rules for soils and forests in order to account for the carbon emissions of forests and agricultural land that cover two thirds of EU territory. An emissions reductions target in the sector will be considered in the future.

Internationally, the EU is supporting the REDD+ partnership and committed 107 million Euros between 2007 and 2012 toward REDD+ initiatives in Asia, Africa and Latin America.



## France

### Climate Change Policy

<b>Position</b>	France considers a 50% reduction in GHG emissions by 2050 (base year: 1990) necessary in order to limit a global average temperature rise to 2°C. At COP18, France supported a second commitment period of the Kyoto Protocol, although stressing that a new agreement is necessary from 2020 where all parties of the convention should face up to their responsibilities. At the level of the European Union, France pushed to include into the energy and climate legislative package a 14% emissions reduction for sectors excluded from the emissions trading scheme.
<b>Status</b>	France is a member of the EU and an Annex I nation committed to the Kyoto Protocol and Copenhagen Accord.
<b>2012 Target</b>	Under the Kyoto Protocol, France pledged to reduce emissions to 1990 levels. The country surpassed its target in 2009, when GHG emissions reached 8% below 1990 levels.
<b>Long-term Target</b>	Reduce GHG emissions by 75% by 2050 (base year: 1990) at an average emissions reduction rate of 3% per year, achieving nearly a 23% emissions reduction by 2020.
<b>Strategy to curb emissions</b>	The <a href="#">Grenelle Environment Forum</a> was launched in 2007 in order to implement relevant climate change policies and strategies, protect the environment, and ensure sustainable competitiveness. In 2010, the Grenelle II bill, which outlines implementation measures to reach the objectives of the Grenelle Environment Forum, was approved. It builds on and deepens the commitments of the first Grenelle Law in six major areas: buildings and urban areas, transport, energy, biodiversity, waste management and governance. Since 2004, France's climate policy is laid out in its Climate Plans that are revised every two years and outline actions for all economic sectors towards achieving its commitment under the Kyoto Protocol.

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	Between 1990 and 2007, France achieved GHG emissions reductions of about 5.6%, attributed in part to the use of nuclear energy instead of fossil based fuels for electricity generation and the high share of hydropower in the overall energy mix. Emissions from the energy sector accounted for only 13% of total emissions in 2007.
<b>Strategy to curb emissions</b>	France's <a href="#">Climate Change Plan</a> sets a target to reduce emissions from the overall energy sector by 42% between 2005 and 2020. These reductions are to be achieved through voluntary measures to enhance energy efficiency, the expansion of renewable sources of energy, and the modernization of the energy generation installations (including shutting down half of their coal-based plants). More specifically, France has set the goal to increase the share of renewable energy to 23% by 2020 through 50 measures that develop and expand bio-, wind-, geothermal-, hydro-, solar-, and tidal energy.

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	The residential sector is the largest energy consumer in France, accounting for 42.5% of final energy consumption and 23% of national GHG emissions, with heating serving as a major cause of inefficiencies. Transport accounts for 26% of national emissions, almost all of which is attributed to road transport. After a period of rapid growth, the rise in transport emissions has stabilized since 2001. Industry accounts for 23% of national emissions, 18% less than in 1990.
<b>Strategy to curb emissions</b>	<p>The Climate Plan aims to reduce energy inefficiencies and emissions from the housing sector through new regulations regarding energy consumption, financial support to improve the energy economy of buildings, and the renovation of public buildings and social housing.</p> <p>To reduce emissions in the transport sector, the Climate Plan sets out the development of public transport and financial incentives to buy efficient private vehicles through the "bonus-malus" measure. Further measures will be implemented to meet the EU targets of blending biofuels into transport fuels and enhance the energy performance of private vehicles. Emissions in the industrial sector will be reduced through the application of the EU Carbon trading system.</p>

## REDD/LULUCF

### Major issues in the forestry or agricultural sector

France is primarily covered by agricultural land (60%) and forests or other semi-natural spaces (34%). France continues to see agricultural land as well as forests, wetlands, or other natural environments shrink due to the growth of urbanization and infrastructure development. GHG emissions from the agricultural sector accounted for 19.8% of total French emissions in 2007 (if agricultural combustion is included). However, French forests represent a major CO<sub>2</sub> sink which has been consistently growing since 1990.

### Strategy to curb emissions

The Grenelle Environment Forum aims to reduce GHG emissions in relation to energy consumption within the agricultural sector, with a goal of 30% low energy-dependent farms by 2013 and an increase in organic agriculture from 6% of agricultural land in 2010 to 20% in 2020. The Grenelle Environment Forum further plans to mobilize the agricultural and forestry sectors for the purpose of developing renewable energy, taking into account any environmental requirements.

Internationally, France committed 20% of its fast-start financing (250 million Euro) to forests. In 2010, France initiated together with Norway the Interim REDD+ Partnership and since then develops and supports the creation of REDD+ expertise in different countries.

## Germany

### Climate Change Policy

<b>Position</b>	At COP17 in Durban, Germany spoke in favor of a second commitment period of the Kyoto Protocol recognizing the responsibility of developed countries to play a lead role while at the same time stressing the necessity of all major emitters to commit to binding emissions reduction targets.
<b>Status</b>	Germany is a member of the EU and, as an Annex I nation, holds commitments to the Kyoto Protocol and is also committed to the Copenhagen Accord.
<b>2012 Target</b>	Germany committed to a 21% emissions reduction by 2012 (base year: 1990) in line with its Kyoto commitments. It achieved its target by the end of 2011, having reduced its emissions by 26.5%.
<b>Long-term Target</b>	Germany commits to a 40% emissions reduction by 2020 (base year: 1990), with emphasis on emissions reductions through the transport, building, and construction sectors. In addition, while not legally binding, the major political parties in Germany agreed upon commitments of 55% emissions reductions until 2030, 70% until 2040, and 80% - 95% until 2050.
<b>Strategy to curb emissions</b>	<p>Germany holds environmental protection as a state objective in its constitution. Its climate strategy includes a combination of saving energy and improving energy efficiency. The core elements of its current strategy build upon the National Climate Protection Programme (2005). Current objectives are outlined in the Integrated Energy and Climate Programme of 2008 and supplemented by additional measures summarized in the National Climate Initiative.</p> <p>In 2011, in the wake of the nuclear disaster in Fukushima, Japan, Germany decided to exit nuclear energy by 2022. To achieve its emission reduction goals, Germany thus announced the Energy Packet with measures extending its use of renewable energies for clean energy generation. It also allocated more funding to this cause (for example, € 500 million to buffer electricity-price increases for major industries, € 5 billion in credits for new wind farms, and an increase of credits for energy efficient building-modernisation from € 936 m. in 2011 to € 1.5 bn. 2012-2014).</p> <p>Internationally, Germany is an active party of multilateral agreements concerning climate change and has various bilateral commitments, such as in knowledge exchange. In addition, Germany is subject to the policies and measures introduced through the EU Emissions Trading Scheme (EU ETS) as of 2005. Some proceeds from this scheme are used as funding for the National Climate Initiative.</p>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	In Germany, 10.9% of 2011 energy demand was covered by renewable energy sources. Due to the decision to phase out nuclear energy (which covered 8.8% of 2011 energy demand) by 2022, there is a risk of increasing GHG emissions in energy production through additional reliance on oil, coal and gas, which covered 34%, 24.3% and 20.4% of 2011 energy demand, respectively. Consequently, the German government enacted policy measures to increase the share of renewable energy in line with the 2010 Energy Concept (amended by the 2011 Energy Package).
<b>Strategy to curb emissions</b>	<p>According to the <a href="#">Energy Concept</a>, the share of renewable energy shall increase to 18% of total energy demand by 2022, 30% by 2030, 45% by 2040 and 60% by 2050. The <a href="#">Energy Package</a> specifies various measures to speed up this process. Feed in tariffs and compensations for energy intensive sectors are used to maintain planning security for the private sector on the energy supply and demand side. In addition, Germany aims to accelerate grid expansion to transport energy from the North (high potential for wind-energy) to the South. Germany also emphasizes the necessity of flexibility in the amount of energy provided by conventional power plants as they will serve as a back-up for the more unstable renewable sources. Biofuels continue to play an important role in Germany's strategy, as well. However, the introduction of petrol with a 10% share of bioethanol at German filling stations from January 2011 sparked some controversy among consumers and politicians.</p> <p>On the international level, Germany promotes the transfer of knowledge on renewable energies and energy efficiency to developing and newly industrializing countries. It does this mainly through the International Renewable Energy Agency which it helped to establish in 2009. It also directly supports projects abroad such as the use of solar thermal power plants in the Sahara-region.</p>

## Efficiency in energy consumption

**Major emission issues in energy consumption** In 2010, Germany stated the aim to reduce electricity consumption by 40 million tonnes CO<sub>2</sub> equivalent by 2020. In 2011, energy consumption in Germany had decreased by 5.3% compared to the previous year. This was the lowest point since 1990. However, a large part of this reduction was due to mild weather (requiring less heating) rather than structural changes. Looking at long-term trends in specific sectors, the share of energy consumption by the industry sector decreased from 20% in 1990 to 17.2% in 2009. The share of households and services combined increased slightly over this period (27.6% to 28.7%) and that of transport increased more clearly (16% to 18.9%).

**Strategy to curb emissions** The German government lists three strategies in their approach to reduce emissions from energy consumption: require, promote, inform. It implements this by a mix of compulsory standards (for example, product standards at the EU level) and laws (such as the introduction of energy management systems in enterprises), subsidy and funding schemes (especially to modernize buildings and to support research into efficient use of energy in industries), and by awareness campaigns. The government aims to set an example by reducing energy consumption of government buildings (with 20% less heat by 2020 from 2010 levels) and vehicles. Germany also relies on the EU Emissions Trading System to incentivize the industry to reduce energy consumption.

## REDD/LULUCF

**Major issues in the forestry or agricultural sector** The deforestation rate in Germany has essentially been at zero percent from 2000 to 2010. In German forests, around 1.2 billion tonnes of carbon are bound in biomass above and below ground. Due to efforts in past decades to build up stocks of forest that had been destroyed during World War 2, growth rates now level out as capacities are restored. Hence capacities for further carbon binding in forests are falling.

At the same time, the agricultural sector in Germany accounted for about 8% of national GHG emissions in 2011. The major contributors are cattle breeding and the use of fertilizers, emissions from organic soil, as well as the use of fossil energy fuels. While studies by the German government do not come to a clear conclusion about the scope for emission reductions, the government aims for structural changes to achieve reductions in these sectors.

**Strategy to curb emissions** In its "[Forest Strategy 2020](#)", Germany aims to maintain and extend, where possible, the size of its forests. For forest maintenance, adaptation to climate change is seen as essential. In terms of the broader land-use, the focus is on maintenance and sustainable use of natural carbon storage, optimization of the use of fertilizers, use of natural-waste products from agriculture for energy generation and reduction of energy consumption in agricultural enterprises. However, due to the relatively small scope for further emission reductions in these sectors in Germany, policies focus on international collaboration to approach REDD/LULUCF issues, especially in developing countries.

## Climate Change Policy

<b>Position</b>	<p>In Copenhagen, Italy followed the European Union's position which sought to limit a global average temperature increase to 2°C above pre-industrial levels, sought to work collaboratively with other developed nations to lower emissions by 25-40% by 2020 and 80-95% by 2050, and held that developing countries as a group should reduce their predicted emissions growth rate by 15-30% by 2020.</p> <p>At COP18, Italy reaffirmed that, as a member of the EU, it is committed to accept the second commitment period of the Kyoto Protocol. Italy stated that it will enhance its strategy to put its economy on a low-carbon pathway, with a particular emphasis on renewable energy sources and energy efficiency policies and incentives, as well as enhance climate resilience and reduce climate risk, committing an estimated 2.5 billion euros per year toward its adaptation strategy over the next 15 years.</p>
<b>Status</b>	Italy is a member of the European Union and an Annex I country committed to both the Kyoto Protocol and the Copenhagen Accord.
<b>2012 Target</b>	For the period 2008-2012, Italy agreed to cut CO <sub>2</sub> emissions by 13.65 million tons from sectors covered by the ETS, with a total cap of 201.63 million tons. During this same period, Italy aimed to reduce its total GHG emissions by 6.5% (base year: 1990), or 483.255 Mt CO <sub>2</sub> /year, in accordance with its Kyoto commitments.
<b>Long-term Target</b>	The EU collectively commits to a reduction in GHG emissions of 20% by 2020 and 80% by 2050 (base year: 1990). This target could be increased to a 30% emissions reduction by 2020 under the conditions of the European Council of December 2009. As part of the <a href="#">EU Climate Action and Renewable Energy Package</a> , Italy commits to reduce emissions from sectors not included in the EU-ETS by 13% (base year: 2005) by 2020.
<b>Strategy to curb emissions</b>	<p>Italy's <a href="#">National Emission Reduction Plan for 2020</a> identifies the following measures aimed at achieving Italy's targets:</p> <ul style="list-style-type: none"> <li>• Create a catalog of low-carbon technologies, systems, and products in order to boost their use in Italy;</li> <li>• Introduce a carbon tax for sectors excluded from the ETS, utilizing revenues generated to support emission reduction initiatives;</li> <li>• Promote energy efficiency, energy generation distribution, renewable source grid parity, and the development of smart cities;</li> <li>• Extend the 55% tax credit for low-carbon investments until 2020 within the building sector;</li> <li>• Shift toward less emission-intensive transportation and promote energy production from waste;</li> <li>• Manage forests as carbon sinks and as a resource of biofuels and biomass.</li> </ul>

## Clean & renewable energy generation

<b>Major GHG emission issues</b>	Thermoelectric power plants account for more than 80% of electric production in Italy while the remaining 20% is provided by renewable sources including hydropower, wind, photovoltaic, and landfill gas. Due to hydropower, the share of renewable energy within Italy's energy supply is higher than average in the OECD.
<b>Strategy to curb emissions</b>	<p>Under the <a href="#">EU Renewable Energy Directive</a>, 17% of Italy's energy consumption should be from renewable energy sources and 10% for renewable energy in transport by 2020. To achieve this, Italy plans to increase the substitution of oil with natural gas, increase the usage of nuclear power, reduce heavy dependence on the import of fossil fuels and electricity, and utilize green certificates and feed-in tariff mechanisms to encourage and support the use of renewable sources for electricity production.</p> <p>Italy's financial incentives of about 6.7 billion euro per year on solar and 5.8 billion on other renewables allowed it in 2011 to become the first country in the world for new renewable energy capacity connected to the grid, as well as the second in the world for installed capacity.</p>

## Efficiency in energy consumption

**Major emission issues in energy consumption** Over the last few years in Italy, energy consumption has slowly increased. However, due to a substitution between gas and oil, CO<sub>2</sub> intensity has decreased. Relative to other European countries, energy consumption in Italy is characterized by a major use of oil and gas, weak coal contribution, structural electricity imports, and lack of nuclear power. Italy has a lower energy intensity compared to the European average due to a shift in the economy from industry to the tertiary sector but, within the private sector, energy consumption is more intensive.

**Strategy to curb emissions** Italy aims to increase the energy efficiency of the national economic system and foster the use of renewable energy sources. This will be achieved through the encouragement of research and development activities in order to promote hydrogen as a main fuel in energy systems and the transport sector, as well as promoting the construction of biomass plants, solar thermal power plants, wind and photovoltaic power plants, waste and biogas-fueled power plants.

### Transport sector:

In Italy, increasing energy prices and an economic recession led to market trends towards a downsizing of cars, increased use of gasoline over diesel (in some segments), and an increase in alternative fuel usage (methane, LPG, and hybrid). In addition, in an effort to counteract the economic crisis, the EU enacted several energy measures to increase purchases of less emission-intensive vehicles:

- New European regulations require that the car industry decrease CO<sub>2</sub> emission levels amongst new cars over time. Under the National Energy Efficiency Action Plan 2007, CO<sub>2</sub> emissions within the transport sector are limited to 140 g of CO<sub>2</sub>/km on average for vehicles sold.
- A temporary incentive scheme was enacted in April 2009 for consumers to replace their older vehicles with new ones meeting certain environmental criteria.
- Grants covering up to 75% of the purchase price (maximum EUR 400,000 per company) can be received by companies for the purchase of new buses meeting Euro 4 or Euro 5 emission standards.

### Building and housing sector:

Italy has produced a variety of policies, measures, and tax incentives to increase the implementation of energy efficiency projects and to promote the purchase and installation of energy efficient equipment. Policies within this sector try to increase energy efficiency within existing and new buildings, as well as appliances.

## REDD/LULUCF

**Major issues in the forestry or agricultural sector** Roughly 1/3 of the national territory in Italy is covered by forest (approximately 10.5 million hectares) and this figure is growing at a rate of about 100,000 hectares per year due to the dismissal of agricultural practices. Forest fires are currently the main contributor to forest disturbance in Italy. Total removals, in CO<sub>2</sub> equivalent, in the LULUCF sector increased by 5.1% from the base year 1990 to 2007.

**Strategy to curb emissions** Italy elected Forest Management as an activity under Article 3.4 of the Kyoto Protocol. The “National Registry for Carbon sinks” was administered by Ministerial Decree in April 2008 as an instrument to estimate GHG emissions by sources and removals by sinks in forest land and related land-use changes. It is estimated that the Registry will be completed, with forest inventory data, by 2012.<sup>2</sup> In the meantime, verified data are already used in the preparation of the GHG inventory. The National Land Use Inventory (IUTI) was recently completed, providing national land use classification for the years 1990, 2000 and 2008.

<sup>2</sup> The National Registry database and status update was unavailable at the time of this publication: <http://www.greta-public.sinanet.apat.it/>.

## United Kingdom

### Climate Change Policy

<b>Position</b>	In order to limit a global average temperature rise to 2°C, the UK held the position that global emissions should be reduced by at least 50% by 2050 (base year: 1990), with developed countries implementing an 80% GHG emissions cut by 2050 (base year: 1990) and 25-40% below 1990 levels by 2020. In addition, with significant financial assistance from public funding and investments from the private sector, developing countries should also be committed to a low carbon development pathway, with levels of effort reflective of their national circumstances.
<b>Status</b>	As a member of the European Union, the UK committed to the Kyoto Protocol with a reduction of GHG emissions of 12.5% (base year: 1990) by 2012 and will implement the Copenhagen Accord.
<b>2012 Target</b>	A reduction in GHG emissions of 22% (base year: 1990) for the first commitment period: 2008-2012.
<b>Long-term Target</b>	A reduction in GHG emissions of 34% (base year: 1990) by 2020 and 80% by 2050. The UK is also in favor of a 20% emissions reduction target within the EU by 2020 (base year: 1990), with an increase to 30% reductions by 2020, provided comparable emissions reduction commitments from other developed countries.
<b>Strategy to curb emissions</b>	<p>The UK plans to transition to a low-carbon economy through a system of carbon budgets set for five year periods beginning in 2008. The Carbon Plan (2011), which supersedes and updates the UK Low Carbon Transition Plan (2009), sets out how to meet emissions reductions of the first four carbon budgets. By 2027, it plans to reduce emissions as follows (baseline: 2009):</p> <ul style="list-style-type: none"><li>• Between 24-39% in the building sector through insulation walls and low carbon heating;</li><li>• 17-28% in the transport sector;</li><li>• 20-24% in the industrial sector improving energy efficiency of production, replacing fossil fuels with clean and renewable energies and through carbon capture and storage;</li><li>• 75-84% in the electricity sector through cleaner and renewable energies, spurred especially by market reforms.</li></ul> <p>In addition, the UK will continue to drive the climate change agenda at the international level through its membership in the European Union and by helping developing countries address climate change mitigation.</p>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	Provisional estimates conclude that carbon emissions from energy generation fell between 2010 and 2011 in the UK. Renewable energies increased to 9.5% of total energy generation, nuclear energy by 3%, while the share of gas fell by 6%. The increases are due not just to increases in capacity but also to a fall in electricity demand due to milder temperatures and favorable weather conditions (wind speeds, higher rainfall) for renewable energy generation. It is questionable whether these trends are sustainable and will allow the UK to reach its target of generating 15% of electricity from renewable energy by 2020.
<b>Strategy to curb emissions</b>	<ul style="list-style-type: none"><li>• Promote electricity market reform to remove uncertainties and attract investment;</li><li>• Meet 15% of energy demand through renewable energies by 2020 through the expansion of eight key renewable technologies: onshore wind, offshore wind, marine energy, biomass electricity, biomass heat, ground source and air source heat pumps and biofuels for transport;</li><li>• Promote Carbon Capture and Storage (CCS) through regulations that enable investment from the private sector in CCS projects;</li><li>• Encourage small scale renewable electricity and heat generation;</li><li>• Promote investments in new gas power plants;</li><li>• Introduce sustainability criteria for renewable transport fuels.</li></ul>

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	In 2009, energy consumption accounted for 62% of the UK's emissions. When considering end use only, buildings make up 38% of emissions, transport 24%, and industry 23%. Although in 2011 total primary
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energy consumption fell by 7.5% compared to 2010, when adjusting for mild weather conditions that changed heating behavior, the net fall in energy consumption only amounted to 2%.

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**Strategy to curb emissions**

Transport sector:

- Promote the development and commercialization of ultra-low emissions vehicles, providing up to £400 million of funding;
- Create the Local Sustainable Travel Fund to support local transport projects;
- Electrification of the North Trans-Pennine route (Manchester to York via Leeds);
- Promote the purchase of low emission buses through extending the Green Bus Fund by £20 million;
- Invest £8 million in low emissions HGVs.

Building and housing sector:

- Overcome financial barriers to make private houses more energy efficient through the Green Deal;
- Support installation of solid wall insulation through the Energy Company Obligation;
- Improve new building standards through changes to the Building Regulations;
- Phase out least-efficient electric appliances from the market.

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## REDD/LULUCF

**Major issues in the forestry or agricultural sector**

Emissions from agriculture, forestry and land use have fallen by 27.6% between 1990 and 2007 as the result of a decrease in the number of animals and fertilizer used, less intensive agriculture, and an expanded forest area, and accounted for 9% of overall emissions in 2009. Although the share is small, further decreasing emissions from agriculture and expanding the forestry sector are considered important for meeting 2050 emissions objectives.

**Strategy to curb emissions**

- Industry-led efforts to adopt more resource-efficient practices outlined in the Agriculture Industry GHG Action Plan: Framework for Action;
- Promote the development of woodlands;
- Ensure high quality carbon projects and forestry practices through codes and standards;
- Support international forestry management projects.



## Japan

### Climate Change Policy

<b>Position</b>	In Durban, Japan announced it would not participate in the 2nd commitment period of the Kyoto Protocol without the inclusion of emerging economies and the US in the agreement. Instead, Japan emphasized the necessity to establish a new, fair and effective legal framework in which all major economies have legally-binding emissions reduction targets in order to reduce global GHG emissions by at least 50% by 2050.
<b>Status</b>	Japan, as an Annex I country, has binding commitments to reduce its GHG emissions. Despite the conclusion of the first Kyoto commitment period, Japan commits itself to continue its ambitious emissions reduction targets beyond 2012.
<b>2012 Target</b>	Reduce GHG emissions by 6% (base year: 1990) during the first commitment period, 2008-2012.
<b>Long-term Target</b>	Japan has a long-term target to reduce its GHG emissions by 80% by 2050 and a mid-term target to reduce its GHG emissions by 25% by 2020.
<b>Strategy to curb emissions</b>	<p><u>National</u></p> <p>Japan is to implement a carbon tax while its domestic emissions trading scheme remains voluntary. Japan seeks to improve energy efficiency, and develop and disseminate energy-saving devices by providing financial incentives to both companies and households. Its financial incentives are also provided to increase the installation of renewable energy devices and use of renewable energy. Due to the Fukushima Daiichi nuclear disaster in 2011 which led to a shutdown of several nuclear power plants and strong public opposition to nuclear energy, Japan has been unable to reduce CO<sub>2</sub> emissions through increases in nuclear energy. Instead, Japan has implemented a feed-in tariff to promote the generation and use of renewable energy. Internationally, Japan pledged \$15 billion (USD) in the Copenhagen Accord to support developing countries. As of February 29, 2012, Japan had implemented 783 projects in 107 countries, to the value of over \$13.2 billion (USD).</p> <p><u>State level</u></p> <p>The law concerning the promotion of the measures to cope with global warming requires all governments of prefectures, cities and villages to establish and implement integrated plans for climate change. All prefectures and 75.6% of cities and villages have established integrated plans. In addition, following Tokyo (April, 2010), Saitama started its emissions trading in April 2011.</p>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	Japan's total energy supply in 2010 was comprised of 28.6% nuclear, 61.8% thermal (25.0% of coal power, 29.3% of liquefied natural gas, and 7.5% of oil, liquefied petroleum gas, and other gases), 8.5% hydro, and 1.1% geothermal and other sources, including renewables. However, in 2011, the Fukushima Daiichi nuclear disaster and the consequent shutdown of multiple nuclear power plants significantly increased the energy supply by thermal (78.9%) and decreased the energy supply by nuclear (10.7%) power. As Japan's main strategy to reduce GHG emissions in the electricity sector, one of the heaviest GHG emitting sectors, has been to switch from fossil-fuels to nuclear, it was difficult for Japan to achieve its target in the first commitment period of the Kyoto Protocol.
<b>Strategy to curb emissions</b>	<ul style="list-style-type: none"><li>• Promote renewable energy;</li><li>• Establish funds for local governments to introduce renewable energy;</li><li>• Provide subsidies for households and owners of buildings to install solar power generation devices;</li><li>• Feed-in tariffs to financially motivate households and businesses to install devices of renewable energy generation (e.g. solar, wind, hydro, geothermal, biomass and etc.).</li></ul>

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	As of 2010, Japan's energy consumption was 14,974 PJ, which came from 6,572 PJ of industry sector (43.8%), 4,972 PJ of commercial and residential sector (33.2%), and 3,430 PJ of transport sector (23.0%). From 1973 to 2009, while energy consumption of the industrial sector decreased by 20%, due to its
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successful energy conservation efforts since the oil crises in the 1970s, energy consumption in the commercial and residential sector and transport sector increased by 140% and 90%, respectively.

According to [Japan's energy white paper](#) in 2011, the commercial and residential sectors occupy 70% of Japan's electricity demand. The industrial sector accounted for 37.6% of emissions, showing a decreasing trend. The transport sector accounted for 20.7% of emissions, also showing a decreasing trend. The commercial and other sectors accounted for 19.3% of emissions, with a constantly increasing trend. The residential sector accounted for 15.3% of emissions, which had been constantly increasing. Consequently, Japan has focused on the latter two sectors to decrease GHG emissions.

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| <b>Strategy to curb emissions</b> | <ul style="list-style-type: none"><li>• Provide technical assistance and tax reductions to promote the construction of environmentally friendly houses;</li><li>• Provide subsidies to improve energy efficiency in houses and buildings;</li><li>• Provide subsidies and tax reductions to promote eco-cars for households and businesses;</li><li>• Establish certification schemes to promote environmentally-friendly marine and rail goods transport;</li><li>• Revitalize and rehabilitate regional public transport;</li><li>• Improve the energy efficiency of products in residential and commercial sectors and transport sector by the top runner program;</li><li>• Create low carbon cities.</li></ul> |
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## REDD/LULUCF

<b>Major issues in the forestry or agricultural sector</b>	The forestry sector is expected to play a key role in mitigating climate change in Japan. Indeed, the <a href="#">Kyoto Protocol Target Achievement Plan</a> sets mitigation targets to 3.8% of the 6.0% stipulated in Japan's Kyoto commitments. In 2011, Japan achieved the target as it reduced 48.9 million tons of CO <sub>2</sub> (3.9% of 6%).
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| <b>Strategy to curb emissions</b> | Maintain healthy forests by various measures including: <ul style="list-style-type: none"><li>• Promoting the use of timber and wood biomass;</li><li>• Promoting citizen-participation style of forest making;</li><li>• Promoting appropriate management and conservation of protected forests.</li></ul> |
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## Russian Federation

### Climate Change Policy

<b>Position</b>	At COP18, the Russian Federation, along with a number of other Annex I countries, expressed that it does not intend to make quantitative commitments for further GHG emission reductions during the second period but will continue to respect all of its current non-quantitative obligations. In addition, Russia stressed the need for active participation by all countries, primarily of major GHG emitters, in a global climate solution.
<b>Status</b>	Russia has been a Party to the Kyoto Protocol since 2004 and agreed to fulfill commitments within the framework of the Copenhagen Accord, as part of its Convention commitments, to reduce emissions in the post-2012 period.
<b>2012 Target</b>	Under the Kyoto Protocol, Russia committed to limiting its GHG emissions (base year: 1990) from 2008-2012. Russia, as an economy in transition, has met its commitments in the first period.
<b>Long-term Target</b>	<p>The Russian Federation aims to cut GHG emissions 15-25% by 2020 (base year: 1990), contingent upon appropriate accounting of the potential for Russia's forestry to contribute toward emission reduction obligations and legally binding emission reduction obligations for all major emitters. In addition, Russia aims for at least a 40% decrease in energy intensity (base year: 2007) by 2020. By 2050, Russia aims for a 50% decrease in emissions (base year: 1990).</p> <p>At COP18, Russia announced that in 2013 it will begin to realize its 2020 emission-reduction goal in concert with other developing countries whose aggregate share of global emissions is roughly 30%.</p>
<b>Strategy to curb emissions</b>	<p>The <a href="#">Climate Doctrine of the Russian Federation</a> outlines the strategic goal of its climate policy as achieving secure and sustainable development. Areas it underlines for climate policy going forward includes better understanding the climate system, future impacts, and risks, developing short- and long-term mitigation and adaptation measures, and engaging with the international community.</p> <p>The Climate Doctrine further aims for the development and implementation of mitigation measures which:</p> <ul style="list-style-type: none"><li>• Enhance energy efficiency across the economy.</li><li>• Expand use of renewable and alternative energy sources.</li><li>• Reduce market distortions and implement financial and fiscal policy to encourage mitigation.</li><li>• Protect and improve carbon sinks.</li><li>• Research and development in energy efficiency, renewable energy, and environmentally-friendly technology.</li><li>• Expand GHG sink technologies.</li></ul> <p>This policy will be implemented on the basis of action plans at the federal, regional, and sector level.</p>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	Russia has a significant amount of energy reserves, along with a powerful fuel and energy complex which play an important role in Russia's economy. In 2009, the energy sector accounted for approximately 82.4% of Russia's GHG emissions, making it the sector with the greatest potential for emissions reductions in Russia.
<b>Strategy to curb emissions</b>	<p>As part of the <a href="#">Climate Doctrine of the Russian Federation</a>, Russia aims to:</p> <ul style="list-style-type: none"><li>• Reduce the share of energy generated from natural gas from the current level of 50% down to 46-47% by 2030.</li><li>• Limit the burning of gas produced from oil wells.</li><li>• Double the capacity of nuclear power plants.</li><li>• Increase the share of electricity produced from renewable energy to 1.5% by 2010, 2.5% by 2015, and 4.5% by 2020.</li></ul>

## Efficiency in energy consumption

**Major emission issues in energy consumption** The majority of GHG emissions in Russia come from energy production and the export of such energy. Overall, GHG emissions have fallen 35.9% since 1990 due to an economic downturn which led to a fall in fuel demand (and thus a decrease in oil and natural gas operations and fuel combustion) as well as a significant change in the overall fuel mix which resulted in less carbon-intensive fuel combustion. Russia's first national standard for environmental requirements in construction, the [National Standard GOST 54694-2012](#) will enter into force in March 2013.

Energy industries made up 49.9% of the emissions within the energy sector, followed by 18.5% from oil and natural gas, 11.5% transport, and 8.2% from other sectors. Manufacturing industries and construction made up 7.6%, fugitive emissions from solid fuels for 2.7%, and the remaining 1.6% was from category other.

**Strategy to curb emissions** According to the [Energy Strategy of Russia up to 2030](#), Russia's long-term state energy policy is guided by energy security, energy efficiency of the economy, environmental safety within the energy sector, and budget efficiency. The energy policy is to be implemented through the creation of a favorable economic environment for the fuel and energy complex operation, the introduction of technical regulations, national standards, and norms that stimulate energy development and energy efficiency of the economy, supporting business initiatives in priority areas related to energy savings and the environment, and by improving management efficiency of state property within the fuel and energy complex.

## REDD/LULUCF

**Major issues in the forestry or agricultural sector** One fifth of the world's forests are located within the Russian Federation, including 70% of all boreal forests and 25% of virgin forests. For this reason, Russia advocates taking account of the contribution forests make to stabilize the climate and suggests developing relevant projects to this end in the new climate agreement.

In 1990 and 1991 the LULUCF sector was a net source of GHG emissions. However, from 1992 onwards, the sector resulted in net removals which have been increasing annually due to the reduction in forest harvesting and changes in cropland management. The high decrease in net emissions is largely due to a 55% reduction in emissions in timber harvesting in the late 1990s and 2000s, a decrease in emissions from cropland soils due to the abandonment of agricultural land, an increase in removals from large areas of cropland converted to grassland, and a decrease in the intensive use of organic fertilizer. Net removals from the LULUCF sector amounted to 649,598.39 Gg CO<sub>2</sub> eq. in 2009.

**Strategy to curb emissions** Russia cooperates with the following international bodies on forests in curbing emissions: UN Forum on Forests, Action plan of the Group of Eight (G8) countries and Pan-European Process on the Protection of Forests in Europe, among others.

## United States

### Climate Change Policy

<b>Position</b>	At COP18, the United States expressed their support for a post-2020 agreement applicable to all countries.
<b>Status</b>	The United States is part of the UNFCCC and signed the Kyoto Protocol but never ratified it. Therefore, it does not face binding emissions targets under this international agreement. Nevertheless, the US signed the Copenhagen agreement and submitted suggested U.S. emissions reduction targets to the UNFCCC.
<b>2012 Target</b>	The US has no binding emissions reductions under the Kyoto Protocol, and therefore had no binding short-term target for the first commitment period, 2008-2012.
<b>Long-term Target</b>	By 2020, the U.S. envisages to cut emissions by 17% (base year: 2005). By 2050, the government has announced it will push for 80% reduction in comparison to 2005 levels.
<b>Strategy to curb emissions</b>	<p>The United States has developed a variety of programs, regulations, and standards authorized under the <a href="#">Clean Air Act</a> (or in some cases, other U.S. statutory authorities) to help mitigate climate change and reduce its GHG emissions. Domestic actions can be divided into:</p> <ul style="list-style-type: none"><li>• Regulatory initiatives that set standards and regulations for transportation, mobile and stationary sources;</li><li>• Voluntary energy and climate programmes through which government partners with the private sector and industry; and</li><li>• The <a href="#">State and Local Climate and Energy</a> program, which provides technical assistance to state, local and tribal governments.</li></ul>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	Electricity generation accounted for 34% of US GHG emissions in 2010. Emissions from the energy industry have shown a rising trend due to increased demand and an increase in carbon intensity caused by a switch from natural gas and hydropower to coal, the price of which increased only slightly. As a result, hydropower generation declined by 6% between 2009 and 2010.
<b>Strategy to curb emissions</b>	<p>The federal government is employing regulatory approaches to curb GHG emissions from the energy sector. Oil and natural gas air pollution standards that will reduce methane and other GHGs were finalized in 2012. In addition, the <a href="#">Renewable Fuel Standard Program</a> requires a minimum volume of renewable fuel in transportation fuel and the proposed <a href="#">Carbon Pollution Standard for New Power Plants</a> aims to set nationally applicable ceilings on carbon emissions for new power plants.</p> <p>Apart from regulatory approaches, the US <a href="#">Environmental Protection Agency (EPA)</a> has been promoting voluntary partnerships such as the <a href="#">Green Power Partnership</a> and the <a href="#">Combined Heat and Power Partnership</a> to promote the adoption of clean and renewable power generation.</p> <p>The federal government promotes carbon capture and storage through a range of activities including pilot programs, safety regulations, and sharing technological know-how. In 2010, the <a href="#">Task Force on Carbon Capture and Storage</a> developed a strategy report to overcome barriers to the development and deployment of CCS.</p>

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	In 2010, emissions from transportation accounted for 27% of US GHG emissions, constituting the second largest source of emissions after the electricity sector. In contrast to emissions from industry, which accounted for 20% and have shown a declining trend since 1990, transportation emissions have been on the rise since 1990. Part of this increase is attributed to declines in average fuel economy of private vehicles offsetting improvements due to the retirement of old, less efficient cars.
<b>Strategy to curb emissions</b>	The federal government is seeking reductions in GHG emissions through regulatory approaches and voluntary partnerships across all sectors. In the industrial sector, the <a href="#">Prevention of Significant Deterioration Program</a> requires owners of large stationary sources of air pollution to obtain permits before constructing or modifying a plant. In the transportation sector, the EPA and the <a href="#">National</a>

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[Highway Traffic Safety Administration \(NHTSA\)](#) introduced GHG and fuel-efficiency standards for new passenger cars in 2010 and new heavy-duty vehicles in 2011.

Apart from regulatory approaches, the EPA is implementing various partnership programs to promote the adoption of energy efficient technologies in the residential, commercial and industrial sectors, such as [Energy Star](#) and the EPA's [SmartWay Program](#).

## REDD/LULUCF

<b>Major issues in the forestry or agricultural sector</b>	Land use, land use change and forestry resulted in a net carbon sequestration equivalent to 15.8% of total GHG emissions in 2010.
<b>Strategy to curb emissions</b>	Although deforestation and land use change in the US is a relatively minor problem, the US government has developed a <a href="#">Forest Service Strategy</a> to promote forests' adaptation to climate change, enhance carbon sequestration potential and research into possibilities to replace fossil fuels. At the international level, the US supports the REDD+ partnership through fast-start financing of \$1 billion (USD).

## +5 Emerging Economies

### Brazil, China, India, Mexico, South Africa

#### Brazil

##### Climate Change Policy

<b>Position</b>	At COP17 in Durban, Brazil showed its support for a multilateral response to climate change under the UNFCCC and urged for a second commitment period of the Kyoto Protocol and enhanced action for mitigation, adaptation, finance, technology transfer and capacity building. At COP18, Brazil stressed its support for the institutional framework under the UNFCCC pointing to the importance of a second commitment period under the Kyoto Protocol.
<b>Status</b>	Brazil is a Non Annex I country and has no obligations to reduce emissions under the Kyoto Protocol.
<b>Short-term Target</b>	Brazil has stated no short-term emissions targets for the time period prior to 2020.
<b>Long-term Target</b>	By 2020, Brazil aims for emissions reductions of between 36.1% and 38.9% relative to its projected emissions.
<b>Strategy to curb emissions</b>	In 2009, Brazil passed <a href="#">Law No 12.187</a> that establishes its national climate policy. Two major instruments to plan and implement climate policy are the <a href="#">National Climate Change Plan</a> and the <a href="#">National Climate Change Fund</a> . <a href="#">Decree No 7.390/2010</a> stipulates the development of Sector Plans to support mitigation and adaptation efforts in different economic sectors, such as forestry, energy, agriculture, and mining, etc. In addition, under the Copenhagen Accord, Brazil outlines a variety of actions that it expects to help it achieve emission reductions including: decreases in deforestation, changes in agricultural practices, an increase in energy efficiency, and rising shares of clean and renewable sources of energy.

##### Clean & renewable energy generation

<b>Major GHG emission issues</b>	In Brazil, 45% of energy is generated by non-fossil sources and hydropower generated almost 90% of electricity between 1990 and 2005. Given the availability of land and a shortage of fossil based transport fuels in the past, the country is relying in large part on domestically produced ethanol to fuel its motor vehicles.
<b>Strategy to curb emissions</b>	In order to meet rising energy demand due to rapid industrialization, the National Climate Change Plan has set the goal to increase by 11% the domestic consumption of ethanol in transport fuels over the next decade (baseline: 2008); to increase the supply of electricity from cogeneration (such as bagasse cane sugar) to 11.4% of total electricity supply by 2030, and to reduce losses in the distribution of electrical energy at a rate of 1,000 GWh per year for the next 10 years (baseline: 2008). Hydropower already plays a large part in the energy mix, but will be further expanded to take full advantage of available capacity.

##### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	Like all industrializing countries, Brazil faces the challenge to meet increasing energy demands from the industrial and transport sectors. Given a limited supply of energy sources, increasing energy efficiency is one of the key goals of the <a href="#">National Energy Efficiency Policy</a> which aims to reduce around 10% of electricity consumption by 2030.
<b>Strategy to curb emissions</b>	While changes in the mix of energy sources are predominant in Brazil's strategy to curb GHG emissions from energy consumption, actions such as the replacement of one million old refrigerators per year for ten years (baseline: 2008) are employed to enhance energy efficiency.

##### REDD/LULUCF

<b>Major issues in the forestry or agricultural sector</b>	Deforestation is the main source of GHG emissions in Brazil, accounting for nearly three-quarters of total emissions. As Brazil has the largest forest in the world, it serves as the "lung" of the planet. Annual carbon emissions from fires in the legal Amazon were estimated to range from 0.2 to 0.5 Pg C yr <sup>-1</sup> . Key
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issues regarding deforestation include the (often illegal) conversion of forest into other land uses (agriculture, human settlements), illegal logging for commercial purposes, and forest fires (partly accidental, partly purposeful in order to evade legal restrictions to convert forest into economically more productive land uses).

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**Strategy to curb emissions**

According to the National Climate Change Plan, Brazil seeks to reduce deforestation in all Brazilian biomass to reach zero illegal deforestation. To this end, the government strives to extend the [Action Plan for the Prevention and Control of Deforestation](#) in the legal Amazon which resulted in a 59% reduction of annual deforestation between 2004 and 2007 to other Brazilian biomass. Main actions include the identification of forests to be protected, creating incentives for sustainable use of forest resources through productive activities, and monitoring and control of deforestation. The government aims to double the area of forest by 2020 by reducing barriers to the forestry industry and harnessing financial support, such as under the Clean Development Mechanism (CDM). Furthermore, Brazil forms part of the REDD+ partnership under which it has developed a series of projects in various parts of the country.



## China

### Climate Change Policy

<b>Position</b>	At the COP17 at Durban, China aligned itself with the G77, stressing the necessity that developed countries should shoulder the responsibility of setting ambitious emission reduction targets under a second commitment period of the Kyoto Protocol to be negotiated according to the Bali Roadmap.
<b>Status</b>	China, as a non-Annex I country, has no binding commitments to reduce its GHG emissions.
<b>Short-term Target</b>	China aims to cut emissions per GDP unit by 17% by 2015, compared to 2010 levels.
<b>Long-term Target</b>	Under the Copenhagen Accord, China announced the voluntary objective to cut emissions per GDP unit by between 40 – 45% by 2020, compared to 2005 levels.
<b>Strategy to curb emissions</b>	China's <a href="#">12<sup>th</sup> Five Year Plan</a> sets out eleven focal areas to cut GHG emissions and the energy intensity of its economy. Strategies include strengthening the legal environment to mainstream climate change, accelerating economic restructuring to promote cleaner industries, cleaning up energy generation, increasing the share of renewable sources of energy, and reducing energy consumption through energy-conservation.

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	China's economic development relies heavily on fossil-based fuels, especially coal. In 2005, energy production accounted for 44.5% of CO <sub>2</sub> emissions. Fast-rising energy demand due to rapid economic development and rising incomes poses challenges to the energy industry.
<b>Strategy to curb emissions</b>	The 12th Five Year Plan sets the target to increase the share of non-fossil sources of energy to 11.4% by 2015; in 2011, non-fossil fuel energy reached a share of 8.1%. To reduce carbon emissions from energy generation, the country focuses on promoting cleaner production of fossil fuels through the development and employment of clean coal technology and unconventional sources of energy such as natural gas, coal-bed gas, and shale gas, and to expand renewable and nuclear sources of energy.

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	China's rapid industrialization implies large energy consumption by industry and the manufacturing sector, which together account for almost 40% of CO <sub>2</sub> emissions. In contrast, the residential and transport sectors are still comparatively minor emitters, accounting for 5 and 7.7%, respectively. However, with increasing incomes, these shares are likely to increase in the future.
<b>Strategy to curb emissions</b>	According to its Five Year Plan, China will lower the energy intensity of its economy by 16% per unit of GDP from 2010 to 2015 and reduce the carbon intensity by 17%. Key areas of action include the improvement of energy conservation through the introduction of energy efficiency standards and the promotion of energy conservation technologies, especially in energy intense industries (coal, cement, iron, steel) and in the housing sector. Fiscal and tax incentives are being used to subsidize the employment of new technologies.

### REDD/LULUCF

<b>Major issues in the forestry or agricultural sector</b>	Forests cover relatively little of China (17%) compared to other countries, with the international average at 34%. Logging and the clearance of forests for other land uses (agriculture) pose major threats.
<b>Strategy to curb emissions</b>	To increase forest carbon sinks, the country initiated five actions including afforestation, improvement of forest management and forest resources administration, enhancing forest disaster prevention, and the promotion of the emerging forest industry. The goal is to increase acreage of new forests by 12.5 million ha, with the forest coverage rate raised to 21.66% and the forest growing stock increased by 600 million m <sup>3</sup> . Subsidies to herdsman are being disbursed to enhance the sustainable management of grasslands and thus increase their carbon sink capacity.

## India

### Climate Change Policy

<b>Position</b>	In Durban, India aligned itself with the G77+China and BASIC negotiating blocs. As part of BASIC, India took an active role in the climate change negotiations to prevent any possible imposition of terms by developed countries and was involved in the final tussle with EU on the precise wording of the Durban outcome.
<b>Status</b>	As a Non Annex I country, India has no obligations to reduce emissions under the Kyoto Protocol. Although ranking fourth in total GHG emissions, due to its large population, India will remain a minor per capita emitter.
<b>Short-term Target</b>	India aims to neutralize 10% of its emissions by 2012 through the application of CDM projects.
<b>Long-term Target</b>	Under the Copenhagen Accord, India voluntarily announced that carbon intensity of its economy would fall between 20-25% by 2020 compared to 2005 levels. However, this pledge excludes emissions from the agriculture sector.
<b>Strategy to curb emissions</b>	<p><u>National level:</u> India's <a href="#">National Action Plan on Climate Change (NAPCC)</a> outlines India's policies and programs (existing or in development) directed at climate change mitigation and adaptation. This plan outlines eight "national missions" through 2017 targeting energy efficiency, renewable energy, climate change research, water efficiency, agriculture, forestation, and ecosystem conservation. Each mission has a lead ministry which will report to the Prime Minister's Council for Climate Change. From July 2010, India started pricing carbon pollution and introduced the carbon tax of 50 rupees per tonne on coal produced and imported to India.</p> <p><u>State level:</u> In order to translate national policies into action, NAPCC objectives have been decentralized and each state of India has been asked to develop targets through a <a href="#">State Action Plan (SAP)</a>. All states have submitted either the final or a draft version to Government.</p>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	Use of commercial fuel (coal, petroleum products and natural gas) has been significantly rising since 1990s, with 63% of present total commercial energy requirements being met by coal, followed by petroleum products (30%) and natural gas. Approximately 70% of the power requirements of the country are met by thermal power plants. However, renewable energy is starting to make a visible contribution, with an annual growth rate of 23%, rising from 3.9 GW in 2002-03 to 24 GW in 2012. By 2019 – 2020, electricity generated from renewable energy is expected to reach 15% of total supply.
<b>Strategy to curb emissions</b>	<p>The <a href="#">Ministry of New and Renewable Energy</a> aims to increase the share of clean power, energy availability and accessibility, energy affordability and equity, focusing mainly on indigenously developed or manufactured products and services. In 2010, the government launched the <a href="#">Renewable Energy Certificate Mechanism</a>, a market-based instrument that enables entities to meet their renewable purchase obligation, and published a detailed strategic plan on developing the renewable energy sector. Other significant developments include providing basic lighting facilities to 5000 villages, the introduction of solar specific purchase obligations, launching of improved cook-stove initiatives and coordinated research, and development initiatives in solar and thermal power, second generation bio-fuels, and hydrogen.</p> <p>Price reforms for clean and renewable energy and the introduction of feed-in tariffs and tax reductions for equipment that uses renewable energy will further create incentives for the development of renewable energy generation. In 2010, <a href="#">Central Electricity Regulatory Commission</a> announced rules for trading renewable energy certificates that can be bought by companies.</p>

## Efficiency in energy consumption

**Major emission issues in energy consumption** As a rapidly industrializing country, India faces severe increases in energy demand from industrial processes and transport. Over 450 million people do not have access to electricity in India, and meeting the basic needs of energy while addressing the growing concerns of climate change is a challenge for the country. Energy security is a major concern and, since coal remains cheap, abundant and locally available, it will be the mainstay of energy in India for many years to come.

**Strategy to curb emissions** The NAPCC envisages an integrated set of activities including financial incentives, the introduction of norms and standards, and public education and outreach in industry, building, and transport sectors through its [National Mission for Enhanced Energy Efficiency](#) and the [National Mission on Sustainable Habitat](#).

The National Mission for Enhanced Energy Efficiency aims to enhance energy efficiency in energy-intensive industries through market-based mechanisms (certification of tradable energy savings), the development of fiscal instruments to promote energy efficiency, and the acceleration of the shift towards energy efficient appliances in industry and households. The primary development goal of this mission is to increase energy efficiency by 20% by 2016/2017 and to avoid a cumulative electricity capacity addition of 19000 MW. It targets large, energy-intensive industries by implementing the [Perform, Achieve and Trade \(PAT\)](#) scheme, under which sectors including aluminium, cement, iron, steel, thermal power plants, textiles and railways will be given targets to reduce energy consumption. Companies that are capable of exceeding their targets will be authorised to trade their energy-saving credits (ECERTs) to the companies that fail to achieve the targets.

The National Mission on Sustainable Habitat (NMSH) focuses on improvements in living conditions through enhanced energy efficiency in residential and commercial buildings, improved waste management and the use of methane from waste to energy schemes, improved urban planning, and public transport development. This mission aims to achieve 30% of energy savings in new residential buildings and 40% energy savings in new commercial buildings. In addition, NMSH aims to achieve 20% and 30% energy savings in already existing residential and commercial buildings, respectively.

## REDD/LULUCF

**Major issues in forestry or agricultural sector** According to the latest forest report, India's forest and tree cover has decreased by 367 km in the past two years since the most recent assessment report in 2009, despite progressive conservation and sustainable forest management programmes. Major vulnerabilities facing Indian forests include over-extraction of natural resources, forest fires, insect outbreaks, and anthropogenic pressures. The total carbon stock of India's forests is estimated to be 6663 m tonnes.

**Strategy to curb emissions** According to the National Climate Change Action Plan, by 2020, the Mission for a Green India envisages doubling the area under reforestation (total area to be restored: 20 million ha), increasing GHG removals by forests to 6.35% of India's annual emissions, and enhancing forest/ecosystem resilience.

## Mexico

### Climate Change Policy

<b>Position</b>	<p>At COP18, Mexico reiterated its commitment to contribute to global efforts to mitigate climate change in accordance to its national capabilities and reiterated its voluntary commitment to reduce emissions by 30% by 2020 against the business as usual scenario.</p> <p>As the host of COP16, Mexico took a leading role towards negotiating the Cancun agreements. The country recognizes the need to limit the rise in global temperatures to 2°C and emphasizes shared but differentiated responsibilities. Mexico participated actively at COP17, pushing for the approval of the Green Fund, which it had promoted since 2008.</p>
<b>Status</b>	<p>Mexico has no internationally-binding commitments to reduce its GHG emissions under the Kyoto Protocol. However, it has set itself voluntary targets that were reiterated in the <a href="#">General Climate Law</a>, published in 2012.</p>
<b>Short-term Target</b>	<p>Mexico worked towards decreasing the increase of emissions by roughly 50 Mt CO<sub>2</sub> in 2012. By November 2011, Mexico had achieved 73% of this reduction and expected to meet its target by the end of 2012.</p>
<b>Long-term Target</b>	<p>Mexico has the voluntary goal to reduce emissions by 30% by 2020 and 50% by 2050 (base year: 2000). This commitment is subject to the condition that an international climate change regime provides adequate financial and technical support towards developing countries' mitigation efforts.</p>
<b>Strategy to curb emissions</b>	<p>Mexico's federal strategy to curb greenhouse gas emissions is outlined in its <a href="#">Special Climate Change Program</a> and focuses on cleaner energy generation (especially in the oil sector), the diversification of energy sources, the improvement of energy efficiency in the public and private sector, and a reduction in deforestation and land degradation. At the sub-national level, each federal entity develops its own <a href="#">Climate Action Plan</a> and since 2012, a pilot program to develop <a href="#">Municipal Action Plans</a> is underway.</p>

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	<p>Mexico's energy generation relies on carbon-based fossil fuels, such as oil and gas. The production and consumption of fossil fuels contribute 60% of Mexico's greenhouse gas emissions. Although Mexico has significant renewable sources of energy, especially in wind power, non-fossil energy only made up 7% of total energy production in 2010. In contrast, the <a href="#">Law of Renewable Energies and Energy Transition (LAERFTE)</a> stipulates that non-fossil sources should make up 35% of energy supply by 2024.</p>
<b>Strategy to curb emissions</b>	<p>To reduce the climate impact of its energy generation, Mexico seeks to clean up fossil based energy generation, to include clean and renewable sources of energy to meet its growing electricity demand, and to strengthen the market for biofuels.</p> <p><u>Oil and gas sector</u>: most significant steps to reduce emissions include the promotion of cogeneration and identification of carbon capture and storage opportunities.</p> <p><u>Electricity sector</u>: Mexico seeks to boost investment in renewable and alternative energies through opening opportunities for small-scale and independent power producers including regulatory adjustments to create greater investment certainty, the establishment of rules and regulations to feed electricity into the national grid, and the removal of bureaucratic barriers and transaction costs. In addition, the <a href="#">Federal Electricity Commission</a> is investing in large scale renewable and clean energy projects (e.g. wind parks at the Isthmus of Tehuantepec), taking advantage of financial resources provided by international banks and agencies.</p> <p><u>Transport fuels</u>: to reduce emissions of vehicle fuels, the country is seeking to promote the production and commercialization of biofuels without jeopardizing food security.</p>

### Efficiency in energy consumption

<b>Major emission issues in energy consumption</b>	<p>Energy consumption by end users represents 50% of national energy consumption; transport, industry, the housing and commercial sectors account for about 90% of this energy use. By 2030, it is expected that transport will represent 50% of end-use energy consumption, followed by industry (30%).</p>
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**Strategy to curb emissions** Priority actions to enhance energy efficiency are implemented in sectors that promise cost-effective solutions including transport, lighting, electric appliances, cogeneration in industry, housing, industrial motors and water pumps in municipalities and the agricultural sector. These actions aim to promote the adoption of more energy efficient technologies through efficiency standards, economic incentives and voluntary certification schemes, and a change in consumption patterns of end users through awareness raising and economic incentives. Changes in consumption patterns are also promoted through a number of subsidised schemes to allow low-income households to replace obsolete appliances with more efficient ones.

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## REDD/LULUCF

**Major issues in forestry or agricultural sector** Although official figures claim that deforestation and forest degradation are relatively small, land use, land use change and forestry (LULUCF) still contribute about 10% of national greenhouse gas emissions. Underlying factors are the conversion of forests to pasture and agricultural land, urbanization, and forest degradation, such as through man-made forest fires.

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**Strategy to curb emissions** Mexico is currently developing its National Strategy for REDD+. Fundamental elements of this strategy are already laid out in the precursor document "[Mexico's Vision for REDD+](#)". According to this document, Mexico aims to reduce emissions from land use change to zero by 2020 and thus to start increasing its emission storage capacity through commercial forestry and sustainable forest projects. Cornerstones to the strategy are sustainable rural development, in order to break the vicious circle between poverty and overexploitation of resources, as well as the inclusion of the commercial forestry sector to manage forest resources sustainably.

Recognizing the importance of Mexico's Protected Areas for climate change mitigation and their vulnerability to climatic changes, the [National Commission for Protected Areas](#) (CONANP) developed the [Climate Change Strategy for Protected Areas](#) through which a number of pilot projects have been launched to identify best adaptation practices.

## South Africa

### Climate Change Policy

<b>Position</b>	At COP18, as part of the BASIC bloc, South Africa, alongside Brazil, China, and India, reiterated its support of the Kyoto Protocol and the adoption of its second commitment period from 2013, as well as the importance for further strengthening ambition levels and the current multilateral rules-based climate regime, in accordance with the principles of equity and common but different responsibilities and respective capabilities. South Africa hosted COP17, taking a leading role in the negotiations.
<b>Status</b>	South Africa is a Non-Annex I nation and has no obligations to reduce emissions under the Kyoto Protocol. However, South Africa signed the Copenhagen Accord and has submitted its mitigation actions to the UNFCCC.
<b>Short-term Target</b>	South Africa has no short-term reduction commitments.
<b>Long-term Target</b>	South Africa aims to reduce emissions 34% below business as usual (BAU) by 2020 and 42% below BAU by 2025, enabled with finance and technology in the context of an international agreement. It envisages that emissions will peak between 2020 and 2025 then level out for about a decade before decreasing afterwards.
<b>Strategy to curb emissions</b>	In July 2012, South Africa launched a <a href="#">Climate Change Response Policy</a> which recognizes and acknowledges its commitment to implement nationally appropriate mitigation actions in order to meet its emission reduction targets. This policy establishes several strategic priorities including: risk reduction and management; mitigation actions with significant outcomes; sectoral responses; policy and regulatory alignment; integrated planning; informed decision-making and planning; technology research, development and innovation; facilitated behaviour change; behaviour change through choice; and resource mobilization. In its policy, South Africa acknowledges that it is essential to use a mix of economic instruments including carbon taxes, emissions trading schemes, and incentives, complemented by appropriate regulatory measures in order to drive and facilitate mitigation across key economic sectors.

### Clean & renewable energy generation

<b>Major GHG emission issues</b>	<p>South Africa is a significant emitter of GHGs for a developing country and, if left unchecked by climate mitigation action, emissions could grow by as much as four-fold by 2050. This is due to the significance of mining and minerals processing and a coal-intensive energy system which has led to an emissions profile that differs significantly from other developing countries. Around half of South Africa's energy emissions, and around 40% of its total emissions, are caused from electricity generation. Transportation and energy used in industry contributed roughly 10% of total emissions each, while industrial process contributed another 14% of total emissions.</p> <p>The failure to provide reliable electricity has increased the urgency to substitute inefficient and obsolete coal-based plants with more efficient and cleaner energy generation technologies, as well as to remove barriers for private participation in renewable energy generation.</p>
<b>Strategy to curb emissions</b>	<p>South Africa pursues a multi-pronged strategy in the energy sector combining regulations and legislation along with market-based approaches to diversify its energy mix. In addition, in its <a href="#">Climate Change Response Policy</a>, South Africa has outlined several flagship programmes aimed at mitigation, including the Renewable Energy Flagship Programme which helps deploy renewable energy technologies.</p> <p>The <a href="#">Renewable Energy White Paper of 2003</a> commits South Africa to contribute 10,000 GWh of renewable energy (biomass, wind, solar, and small-scale hydro plants) to its overall energy supply. The <a href="#">Department of Minerals and Energy</a> has set up the <a href="#">Renewable Energy Finance and Subsidy Office</a> to manage renewable energy subsidies and offer advice to developers. Given that the economy will be coal-based for the years to come, South Africa is attempting to mitigate negative environmental impacts technologically.</p> <p>Through the <a href="#">Biofuels Industrial Strategy</a>, the government aims to achieve 2% penetration of biofuels in the national liquid fuel supply, which is equivalent to 400 million litres per annum.</p>

## Efficiency in energy consumption

**Major emission issues in energy consumption** As South Africa's economy depends on large scale primary resource extraction and processing, industrial processes (such as the production of iron and steel) are key consumers of energy and, thus, key carbon dioxide emitters. Transport and agriculture also significantly contribute to greenhouse gas emissions, although the latter mostly does so through the production of methane from livestock production, fertilization, and the release of carbon due to land use change.

**Strategy to curb emissions** The government has introduced a variety of measures targeting households and industry to reduce energy demand such as energy audits, financial incentives to use solar-water heaters, and to replace incandescent light bulbs.

### Energy Efficiency and Demand Management Flagship Programme

The Department of Energy will develop and facilitate an aggressive energy efficiency program for industry, covering non-electricity energy efficiency, as well. It will include various programmes and initiatives that further the development of energy specifications, standards, green construction practices, and emissions audits targeting low-income housing as well as commercial, residential, and government buildings.

### Transport Flagship Programme

The Department of Transport will aid the development of an enhanced public transportation program and promotes lower-carbon mobility in five metro areas and ten smaller cities. It will further create an Efficient Vehicles Programme to improve the average efficiency of vehicle fleets by 2020, a Government Vehicle Efficiency Programme to improve the efficiency of government vehicles, also by 2020, and includes a planned rail re-capitalization programme to encourage a shift in passenger and freight transportation from road to rail.

### Carbon Capture and Sequestration Flagship Programme

This programme includes, along with other measures, the development of a Carbon Capture and Sequestration Demonstration plant that will store emissions from an existing high carbon emissions facility.

## REDD/LULUCF

**Major issues in forestry or agricultural sector** South Africa's forests cover less than 1% of its land surface. Vegetation change through agricultural expansion, land degradation (mainly through agricultural overexploitation), and the expansion of urban areas are contributing to the release of carbon and the reduction of carbon sequestration potential. However, emissions from agriculture and land-use change (primarily deforestation) contribute a significantly smaller share to South Africa's total emissions (5%) than most other developing countries (44%).

Commercial agriculture comprises 12% of GDP and 30% of national employment. Crop failures can therefore have a significant impact on South Africa's economy. Due to South Africa's history of apartheid, policies related to land and conservation that excludes people from productive activities (e.g. national parks) are highly politicized and difficult to implement. A climate response strategy must therefore recognize that agriculture provides not only food, but also a range of other socio-economic and environmental benefits.

**Strategy to curb emissions** To halt land degradation and vegetation change, the government has adopted a mix of conservation and sustainable land management policies. Key initiatives include:

- Participatory forest projects that support local communities to engage in productive timber and non-timber based activities while conserving forest resources.
- The expansion of protected areas and the more systematic inclusion of forests in South Africa's protected areas network.
- Sustainable forestry projects.
- Sustainable agricultural projects to halt land degradation and conserve biodiversity through integrated sustainable rural development.

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