Fact sheets on the world's largest carbon dioxide (CO_2) emitters and other counties of particular interest

9 September 2014

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The FOEN is an agency of the Federal Department of the Environment, Transport, Energy and Communications (DETEC).

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Note: This study/report was prepared under contract to the Federal Office for the Environment (FOEN). The contractor bears sole responsibility for the content.

Disclaimer

This document illustrates currently available information on the current international emission reduction commitments or goals of the world's largest CO_2 emitters and other countries of particular interest to Switzerland. The information has not been approved by the respective Governments. It is drawn from various sources and may include arguable or incomplete assumptions. Furthermore, the pledged goals of some Parties have uncertainties around the real expected emission reductions as the current international regime is lacking common rules. The fact sheets have been produced by *Econability F. Vöhringer* with support provided by the Swiss Federal Office for the Environment FOEN. The content of the fact sheets has not been approved by the Swiss Government and does not prejudge the Swiss position in international climate negotiations.

The 22 world's largest emitters, each responsible for at least 0.9% of total world CO_2 emissions, are: China, United States of America, European Union, India, Russia, Japan, Germany, Republic of Korea, Iran, Canada, Saudi Arabia, Mexico, United Kingdom, Indonesia, Brazil, Italy, Australia, South Africa, France, Turkey, Poland and Ukraine. Other countries, with less than 0.9% of total world CO_2 emissions, considered in this analysis are: Spain, United Arab Emirates, Netherlands, Belgium, Austria, Singapore, Sweden, Denmark, Switzerland, Norway and New Zealand.

The analysed international commitments or goals form part of the international climate regime under the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol[1]. They have been pledged by the Parties to the UNFCCC in the following to the Copenhagen Climate Summit (2009) as part of the Copenhagen Accord[2] and anchored under the UNFCCC through the Cancun Agreements[3] (2010) and the adoption of the legally binding second commitment period under the Kyoto Protocol in Doha[4] (2012). The current international climate regime includes all the Parties, however, the level of mitigation ambition is currently not sufficient, including because some large emitters are not contributing.

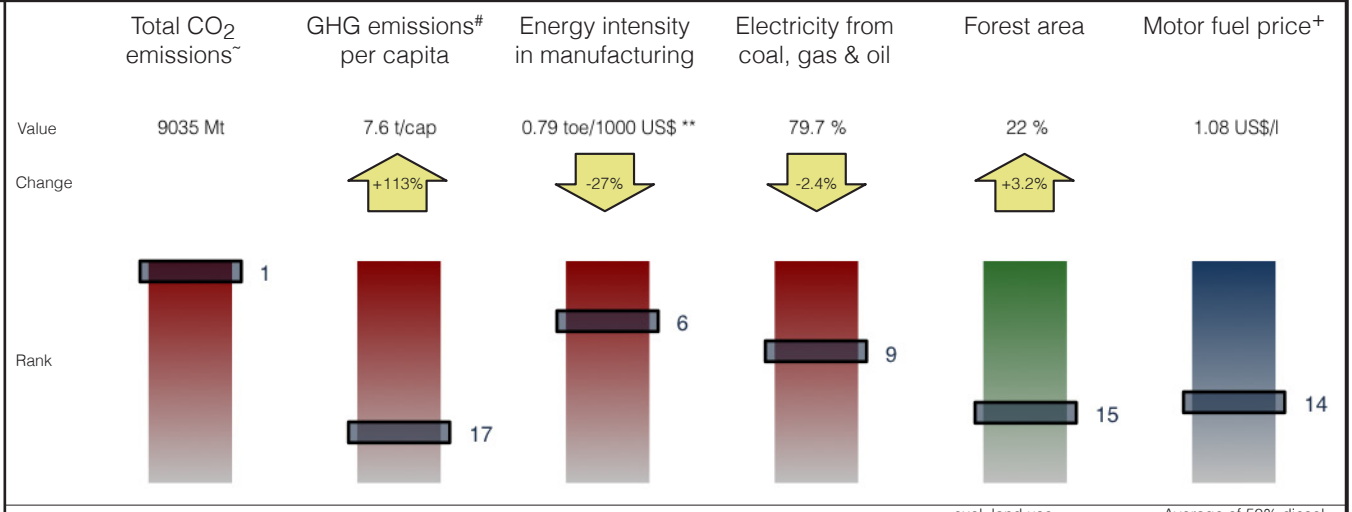
[1] EU member States have a joint commitment at international level.
[2] http://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php
[3] http://cancun.unfccc.int/mitigation/
[4] http://unfccc.int/files/kyoto_protocol/application/pdf/kp_doha_amendment_english.pdf.

CHINA

	Value°	Rank *
Population:	1'344 mio	1
Annual population growth:	0.5 %	16
GDP per capita:	5'445 US$/capita	18
Fossil fuel resources:	65 tC/capita	12

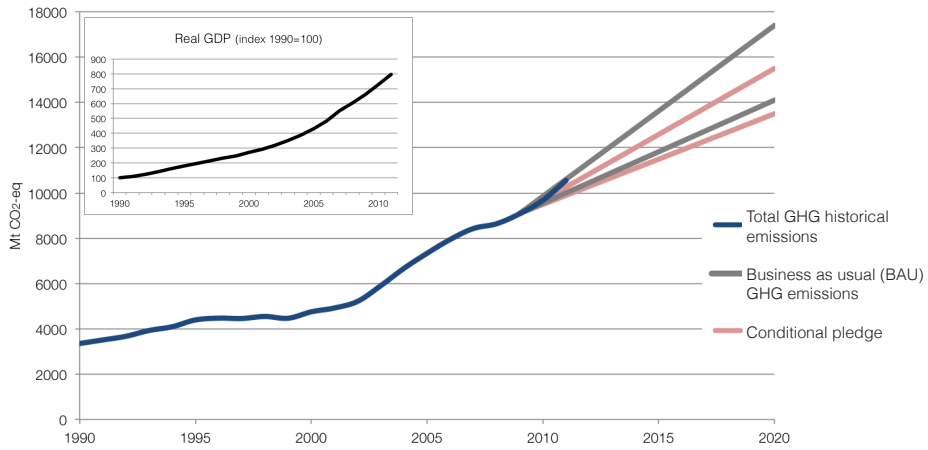
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: Information on historical emissions differ depending on the sources. BAU projections and pledge estimations come from Ecofys et al. 2012. The absolute emissions under the pledge are uncertain and depend on GDP projections, because the pledge is defined in CO_2 emissions intensity.

Pledge (non-legally binding):

Reduce CO_2 emissions per unit of GDP by 40–45% by 2020 compared to the 2005 level, increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020 and increase forest coverage by 40 million hectares and forest stock volume by 1.3 billion cubic meters by 2020 from the 2005 levels.

These actions are voluntary in nature and dependent on financial support to be provided by developed Parties.

DOMESTIC POLICIES

China adopted a National Climate Change Programme in 2007 and a Climate Change Resolution in 2009. Despite this, a comprehensive climate change law is expected to pass the National Peoples' Congress only in 2015. Existing climate-related laws focus on energy efficiency to enable China to continue its strong economic growth.

China's 12th Five Year Plan (March 2011) formulates targets for carbon and energy intensity of GDP (reductions of 17% and 16%, respectively, by 2015 relative to 2010). According to IEA data, CO_2 emission intensity from energy-related emissions decreased by 14.6% between 2005 and 2010. To reach its target under the pledge, China will have to decrease its CO_2 intensity in the period 2015-2020 by 15.4% or 22.4% (for the -40% and -45% targets, respectively).

The intensity targets of the Five Year Plan have been broken down to Provincial and Municipal levels. In 2012, the Shenzhen Special Economic Zone was the first in China to pass local legislation to reduce GHG emissions. Several Provinces have launched pilot emissions trading systems in 2013.

The 12th Five Year Plan also calls for an increase of non-fossil energy (from 8.3% in 2010 to 11.4% by 2015) as well as an extension of the forested area.

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

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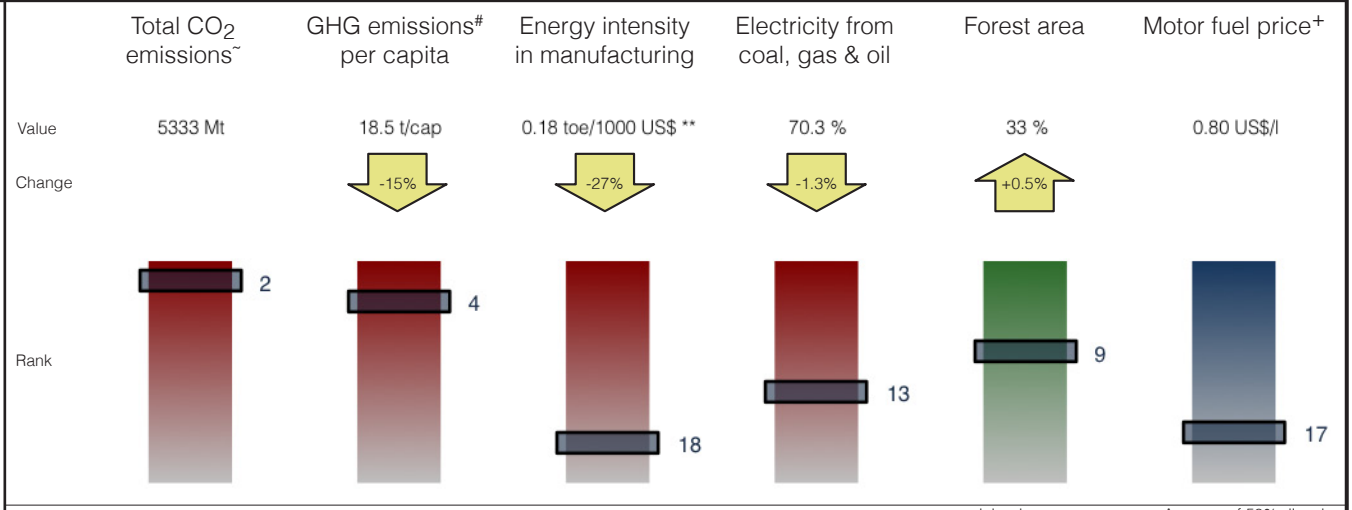
USA

	Value°	Rank *
Population:	312 mio	4
Annual population growth:	0.7 %	12
GDP per capita:	48'112 US$/capita	3
Fossil fuel resources:	576 tC/capita	5

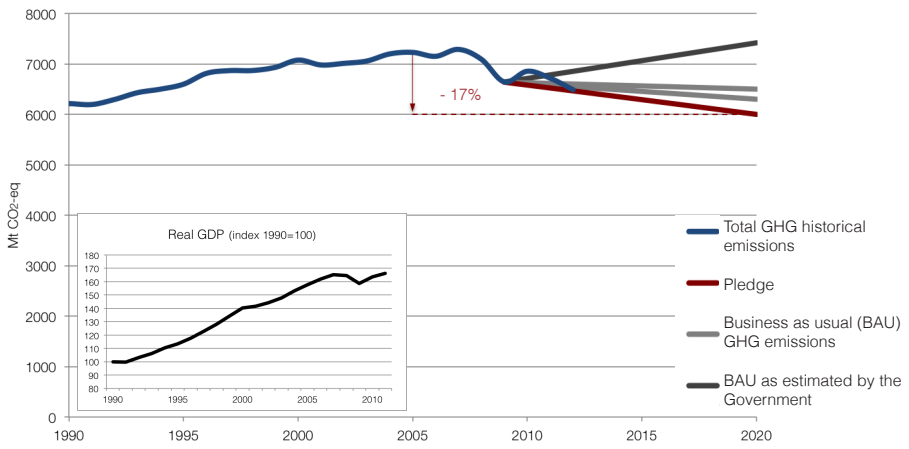
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections were taken from Ecofys et al. 2012. For the USA, the fact that the land use, land use change and forestry (LULUCF) sector is a large sink and uncertainties around LULUCF accounting methods imply that the pledge could be less stringent than it appears here.

Pledge (non-legally binding) :

Emission reduction by 2020 in the range of 17% from 2005, in conformity with anticipated US energy and climate legislation.

DOMESTIC POLICIES

So far, comprehensive climate change bills have failed to pass Congress. However, there are policies on renewable energy and energy efficiency such as incentives for energy savings and for the development of clean energy technology. For example, the American Recovery and Reinvestment Act of 2009 allocated US$ 94 billion for research and development as well as incentives to renewable energy technologies, smart grids, low emission vehicles, public transport, and energy efficiency.

In 2009, the US Environmental Protection Agency (EPA) issued an "endangerment finding" under the Clean Air Act requiring the EPA to take action concerning certain sources of GHG emissions that together amount to more than half of total US GHG emissions. The first regulations that have been developed by the EPA concern large sources such as power plants, industrial sources and (non-agricultural) methane sources as well as standards for mobile sources.

In 2013, the Obama Administration declared the Climate Action Plan, which aims to cut GHG emissions with a focus on electricity generation, transportation, and energy efficiency. In June 2014, President Obama announced a 30% national reduction target for CO_2 emissions from power plants in 2030 (relative to 2005 levels). On this basis, the EPA issued the Clean Power Plan, which aims to cut carbon emissions from power plants providing flexibility on the State level. Also in June 2014, the Supreme Court confirmed the legal right to address GHG emissions from large power plants, refineries and chemical factories via the Clean Air Act.

There are many policies on climate change at the State level, the most salient example being California, which has ambitious long-term State level targets for GHG emissions and a cap-and-trade system. More than 35 States have set renewable energy targets; more than 25 pursue energy savings targets.

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° Generally 2011 data.
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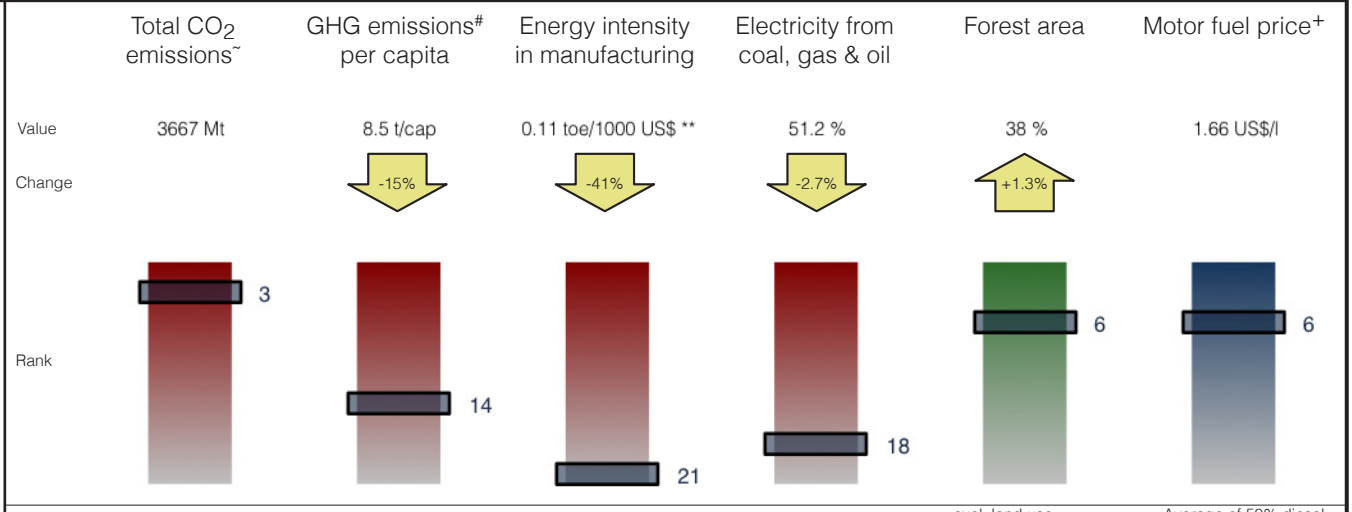
EU-27

	Value°	Rank *
Population:	504 mio	3
Annual population growth:	0.3 %	18
GDP per capita:	34'892 US$/capita	9
Fossil fuel resources:	85 tC/capita	11

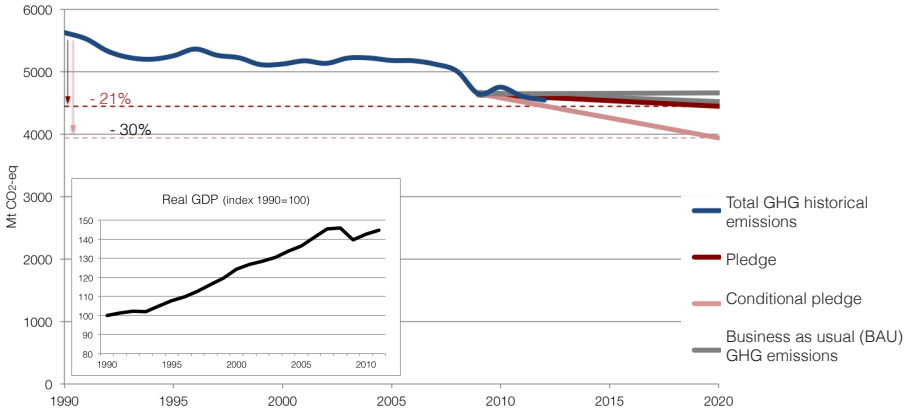
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: Under the Kyoto Protocol budget approach, the EU pledge was translated into an amount of QUELROs (Quantified Emission Limitation and Reduction Obligations) that imply an effective emissions reduction in 2020 of -21% relative to 1990 levels. The lower bound of the BAU projections was taken from European Environment Agency 2012 and takes into account existing measures. The upper bound of BAU projections was taken from Peterson Institute for International Economics 2007. In the EU, the land use sector is a considerable sink. However, the EU does not account for this sink in its unconditioned pledge of -21% by 2020.

Pledge (legally binding, ratification pending):

20% reduction of GHG emissions by 2020 relative to 1990 unilaterally.

Conditional pledge (non-legally binding):

30% reduction of GHG emissions by 2020 relative to 1990 as part of a global and comprehensive agreement for the period beyond 2012 and provided that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities.

DOMESTIC POLICIES

The EU Emissions Trading System (ETS) entered into force in 2005. The current third phase of the EU ETS (2013-2020) sets an EU-wide cap for emissions from large industrial sources, including among others the power sector and airlines. The EU ETS covers about 45% of total GHG emissions in the EU. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method (rather than given away for free on the basis of harmonised allocation rules), with more than 40% of allowances auctioned already in 2013. With the exception of aviation, the share of auctioned allowances will be between 70% and 100% in 2020, depending on the respective sector. Since allowance prices have been low, the EU Commission postponed the auctioning of 900 million allowances until 2019-2020.

For non-ETS emissions, the Member States made quantitative reduction commitments for 2020 under an Effort Sharing Decision (ESD).

The EU´s Climate and Energy Package established “20-20-20” targets for 2020: 20% GHG emission reduction w.r.t.1990, 20% energy consumption from renewables, and 20% increase in energy efficiency. The EU issued legal frameworks to promote renewable energy and sustainability of bioenergy supply. The EU regularly tightens emission performance standards for new passenger cars and light commercial vehicles. Energy efficiency policies focus on public transport and building sectors.

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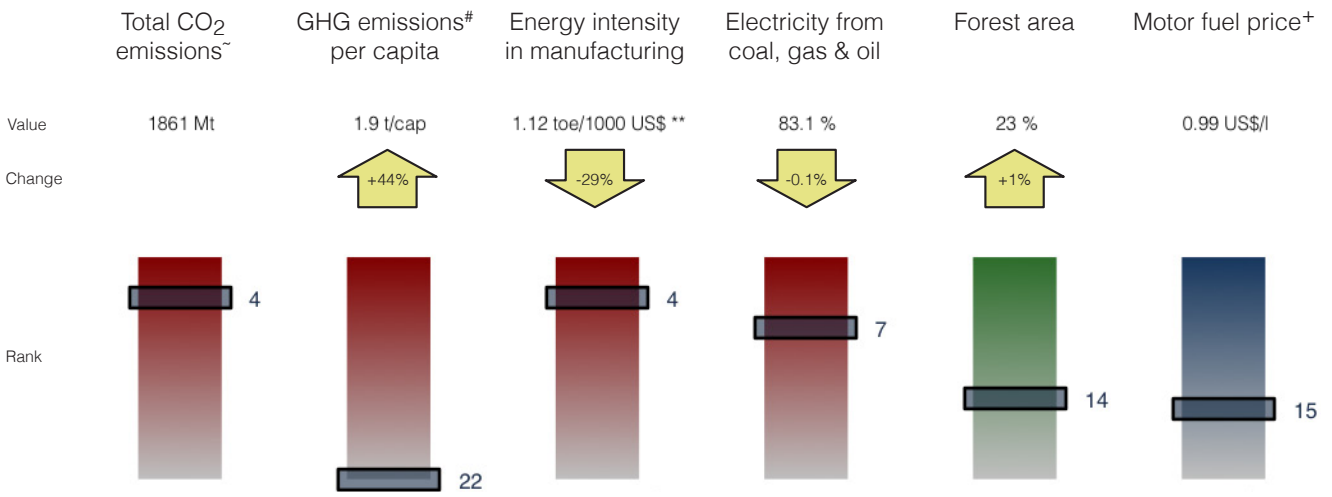
INDIA

	Value°	Rank *
Population:	1'241 mio	2
Annual population growth:	1.4 %	3
GDP per capita:	1'489 US$/capita	22
Fossil fuel resources:	37 tC/capita	13

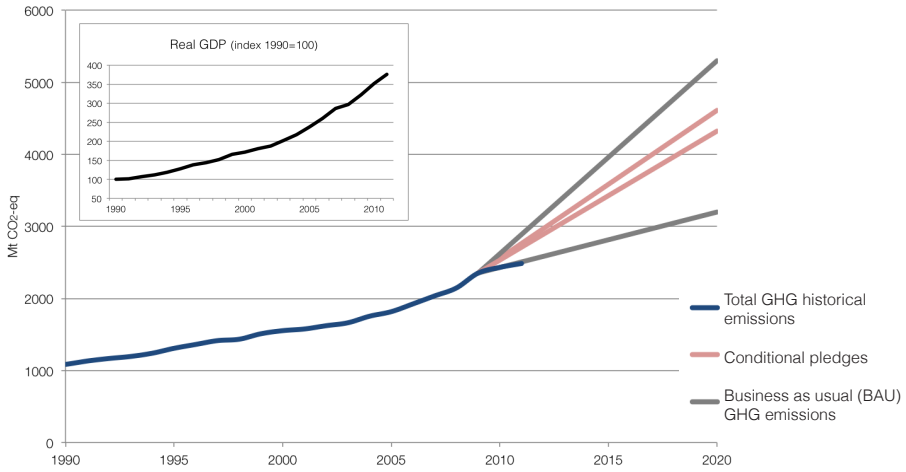
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections from Ecofys et al. 2012. As the pledge is set in emission intensity, we estimated the absolute GHG emissions assuming a growth rate of 8% from 2005. The Indian Government assumes GDP growth projections of 8-9%, which seems rather high given current GDP growth rates in India.

Pledge (non-legally binding):

Reduce the emissions intensity of GDP (excluding agriculture) by 20-25% by 2020 relative to 2005.

Actions are voluntary in nature and dependent on financial support to be provided by developed Parties.

DOMESTIC POLICIES

The National Action Plan on Climate Change (NAPCC) from 2008 is structured into eight National Missions to be accomplished until 2017 including missions on Solar (increase photovoltaic capacity by 1 GW per year), Enhanced Energy Efficiency, Green India (increase forest cover from 23% to 33% of the territory), and Strategic Knowledge (research fund). India has announced a blending target for bio-diesel and bio-ethanol of 20% by 2017. In electricity generation, there are capacity targets for renewables of 72 GW by 2022 (22 GW of which are envisaged to be solar) and for nuclear energy of 20 GW by 2020.

Regulations and/or tax incentives address a number of relevant areas such as energy conservation in buildings, solar and wind power. The State Electricity Regulatory Commissions (SERCs) are obliged to purchase a minimum share of electricity from renewable sources. A trading system with Renewable Energy Certificates has been introduced to minimize the costs of these obligations. In 2010, India introduced a coal tax of 50 Rupees per ton (roughly 1 US$/t) with the revenues earmarked for a National Clean Energy Fund.

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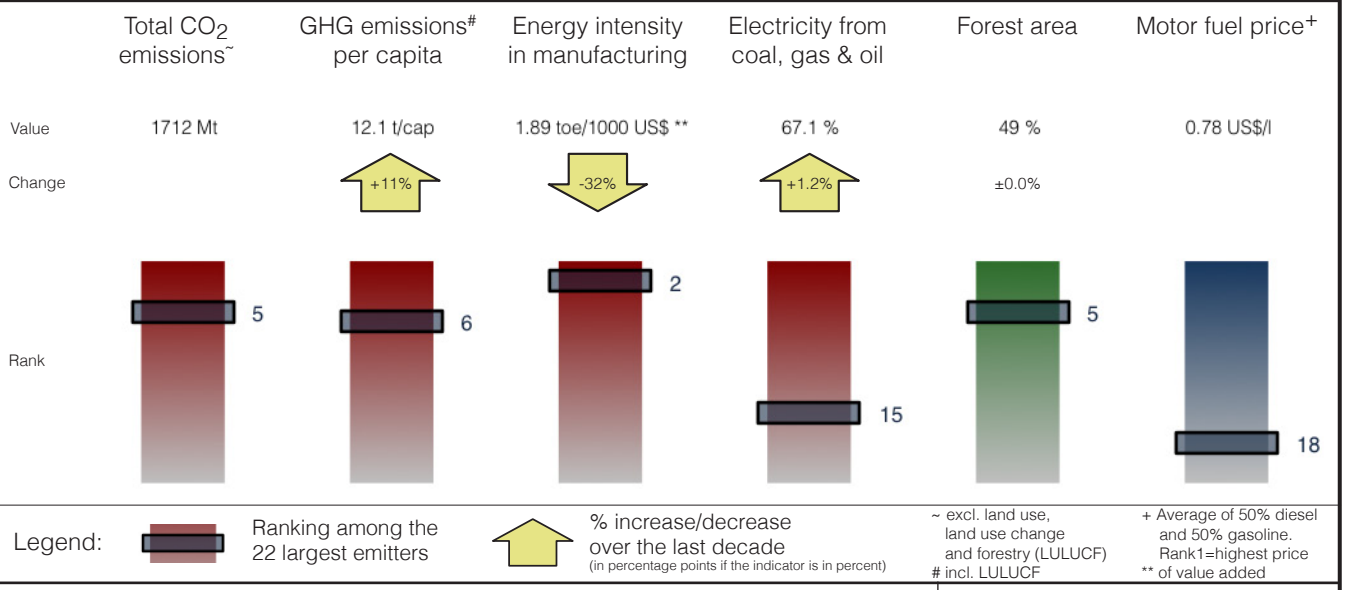
RUSSIA

	Value°	Rank *
Population:	142 mio	7
Annual population growth:	0 %	20
GDP per capita:	13'089 US$/capita	13
Fossil fuel resources:	1'060 tC/capita	3

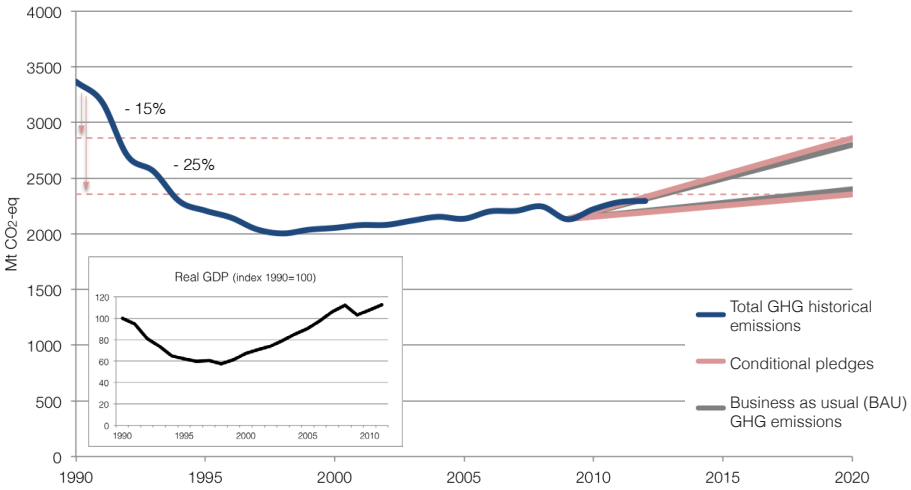
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections were taken from Ecofys et al. 2012. The graph excludes emissions from the land sector, which is a considerable sink in Russia.

Pledge (non-legally binding):

Reduction of 15-25 % by 2020 compared to 1990 levels.

The range of the GHG emission reductions will depend on the following conditions:
1) Appropriate accounting of the potential of Russia's forestry;
2) Undertaking by all major emitters of the legally binding obligations.

The Russian Federation intends to fulfil such commitments by participating in a new comprehensive legally binding agreement, which should be developed before the end of the first commitment period of the Kyoto Protocol.

DOMESTIC POLICIES

The Climate Doctrine from 2009 is not a bill, but a declaration on strategic guidelines in Russian climate policy. It calls for research as well as measures for mitigation and adaptation and recognizes the importance of participating in international efforts. Stated objectives of the Climate Doctrine are to put a price on CO_2 emissions, to (mildly) reduce the share of natural gas in primary energy supply (mostly by increasing the share of nuclear energy, but also of renewable energy), to increase energy efficiency, and to incentivise technology development and deployment.

Government Decree No.1-r from 2009 sets a target share for renewables in electricity generation, excluding large hydro, of 4.5% in 2020. Several laws and regulations have been implemented to improve energy efficiency and conservation, notably the Thermal Performance of Buildings Code in 2003 and the Federal Energy Efficiency Law 261-F3 in 2009. Russia is the world´s largest CO_2 emitter from flaring in the world. In 2009, limits for gas flaring have been established.

In September 2013, a Presidential Decree established a legally binding and unconditional national target of -25% relative to 1990 emissions. Translation of the new target into sectoral objectives and implementation of a national GHG accounting system is still pending as of spring 2014.

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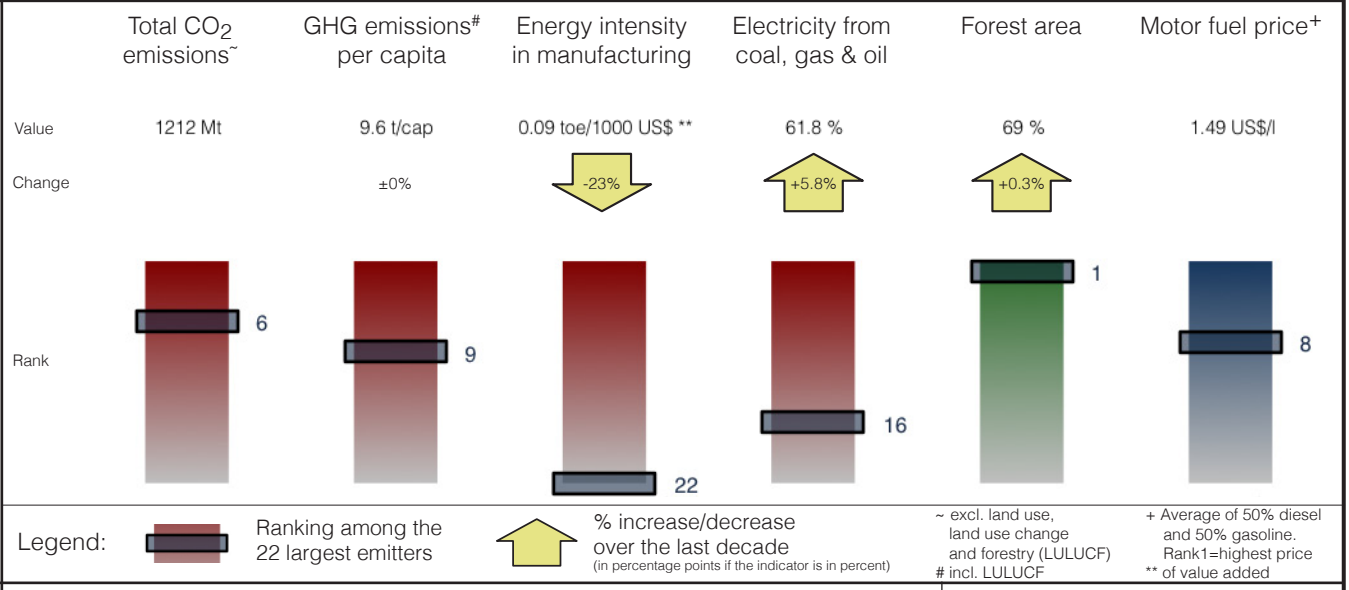
JAPAN

	Value°	Rank *
Population:	128 mio	8
Annual population growth:	0.3 %	17
GDP per capita:	45'903 US$/capita	4
Fossil fuel resources:	2 tC/capita	19

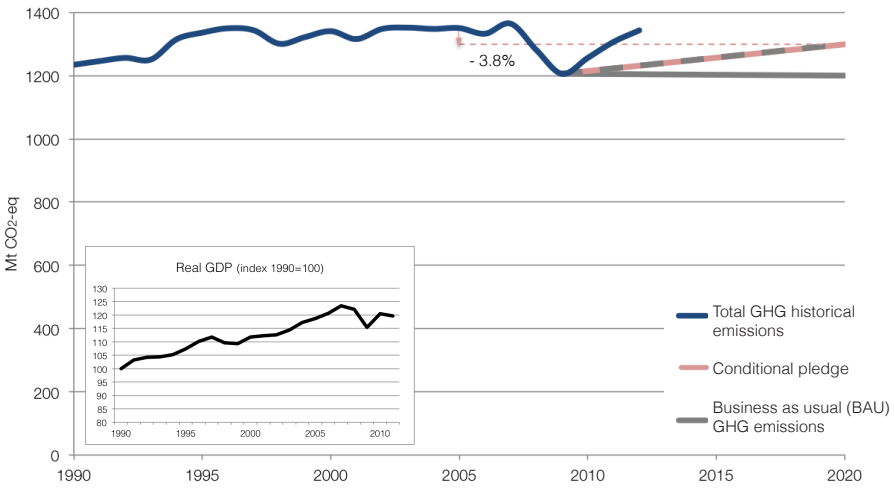
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections taken from Ecofys et al. 2012 do not include the nuclear phase out. The higher projection coincides with the pledge.

Pledge (non-legally binding):

3.8% reduction by 2020 compared with fiscal year 2005.

DOMESTIC POLICIES

In 2012, a carbon tax was established. It adds to the pre-existing tax regime on crude oil and coal imports. The design provides gradually increasing tax rates for three and a half years, beginning in October 2012. Eventually, it will increase up to JPY 289 (EUR 2.1) per ton of CO_2. It is intended to dedicate the revenue to measures aimed at reducing energy related CO_2 emissions.

A feed-in tariff scheme to promote electricity generation from renewable sources came into effect in July 2012. A mandatory emissions trading scheme for GHG emissions in the Tokyo Metropolitan Area was launched in 2010. Participation in an existing nationwide cap and trade system is voluntary.

The Energy Conservation Act of 1979 stipulated efficiency standards for vehicles, appliances, houses and buildings. The legal framework was revised and strengthened in 2008. The Low Carbon City Promotion Act went into force in 2012 and aims at classifying buildings with respect to CO_2 emissions in order to provide incentives for energy savings.

In the aftermath of the 2011 earthquake, most nuclear power plants were shut down. In 2014, the Abe Administration announced a plan to reinstate nuclear power generation to the former level, beginning in 2015.

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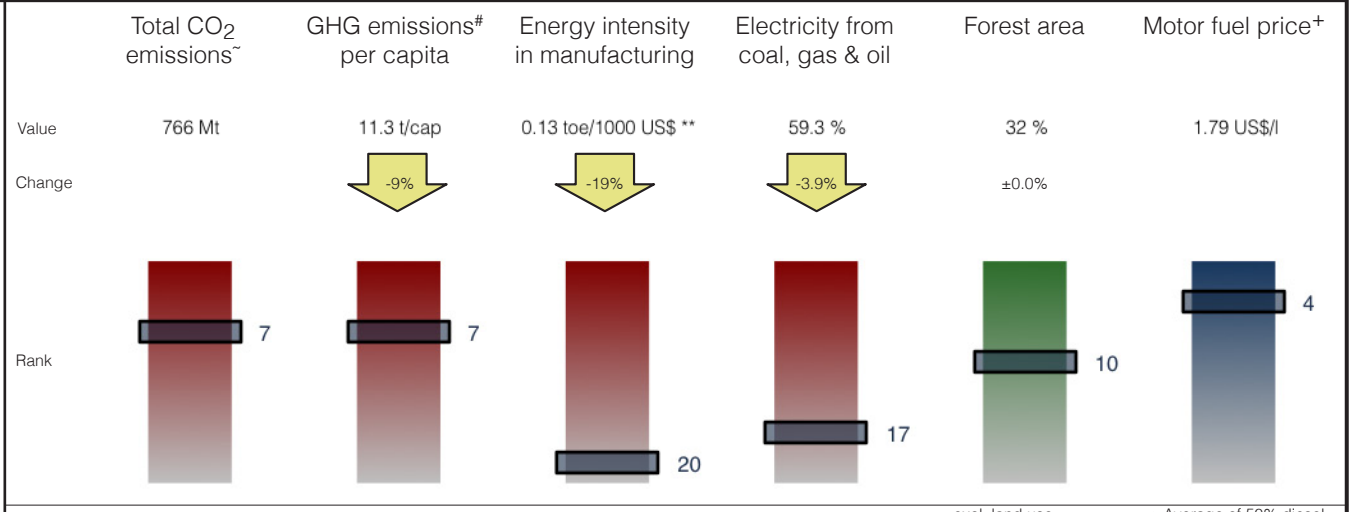
GERMANY

	Value°	Rank *
Population:	82 mio	10
Annual population growth:	- 0.1 %	21
GDP per capita:	44'060 US$/capita	5
Fossil fuel resources:	363 tC/capita	9

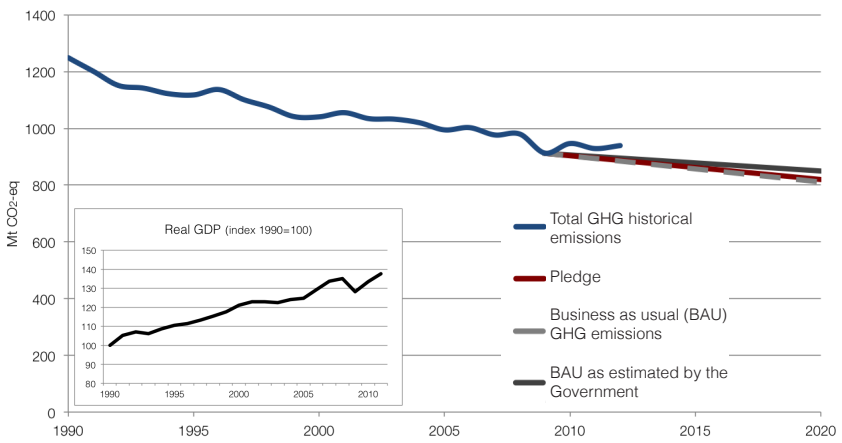
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Germany´s GHG emission reduction in 2020 w.r.t. 2005 is -18%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Germany participates in the legally binding EU commitment (ratification pending). The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990 (conditional pledge: -30%).

In an EU-wide effort sharing decision, Germany has committed itself to a reduction of -14% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 49% of total emissions in Germany. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

Germany has formulated national GHG abatement targets of -40% in 2020 and -80% in 2050 with respect to 1990 levels, which are more ambitious than the international pledge and, for 2020, imply emissions that are somewhat below BAU.
As an EU Member State, Germany takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.
Electricity generation, traditionally dominated by coal and nuclear, has become an important field of German climate-related policies. Germany plans to generate 35% of its electricity from renewable sources in 2020. This is also related to the nuclear phase-out, which will be completed in 2022. A feed-in tariff for electricity from renewables has been boosting renewables capacity. A major impediment to the further growth of electricity generation from wind power has been the lagging expansion of the transmission grid. As a consequence, grid expansion, including additional storage facilities, has become a Government priority.
The Integrated Climate and Energy Programme includes 29 measures that address a wide range of energy issues such as energy efficiency, energy-related requirements for new and renovated buildings, renewable energy for heat, and carbon capture and storage. 400 million Euros of revenues related to the EU ETS will be channelled towards low carbon projects. Regarding transport, the Programme includes measures such as an increased road toll for trucks, energy labelling for passenger cars, and a CO_2-based reform of the vehicle tax. Germany aims at a biofuel share of 17% by 2020.

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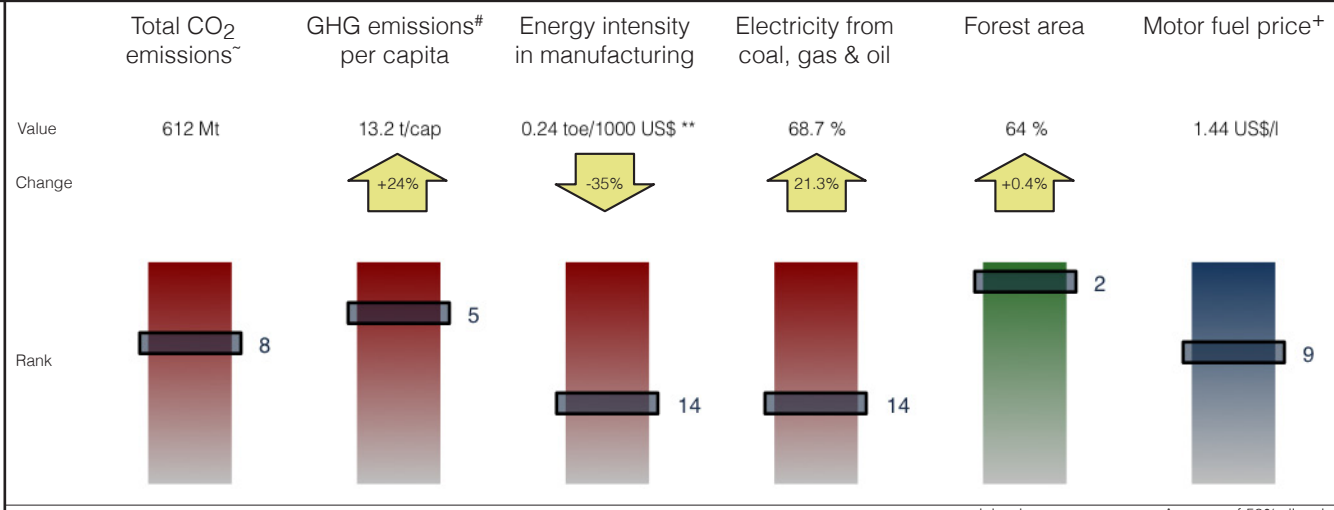
KOREA, REP. OF

	Value°	Rank *
Population:	50 mio	17
Annual population growth:	0.7 %	11
GDP per capita:	22'424 US$/capita	10
Fossil fuel resources:	2 tC/capita	20

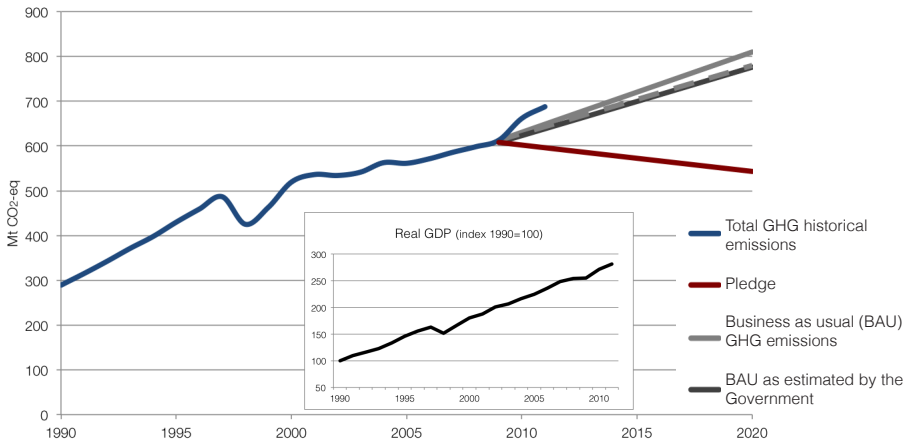
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections taken from Ecofys et al. 2012. The lower projection coincides with the BAU estimated by the Government. We calculated the absolute emissions that the pledge represents as a 30% reduction from BAU as estimated by the Government. Absolute emissions for pledges that are based on BAU projections are inherently uncertain, because BAU emissions may be subject to change.

Pledge (non-legally binding):

Reduce GHG emissions by 30% from the 'business as usual' emissions in 2020.

DOMESTIC POLICIES

The Energy Vision 2030 formulates the objectives to reduce energy intensity by 46% compared to 2007 and to achieve a renewable energy share of 11%. The Republic of Korea has fuel efficiency standards based on engine size. Policies included mandatory emission cuts for large emitters under the threat of penalties.

In 2012, the National Assembly decided to launch a domestic cap-and-trade emissions trading scheme (ETS) that follows the EU model. The start of the scheme is scheduled for January 2015.

In January 2014, the Ministry of the Environment announced the GHG Emissions Reduction Roadmap 2020, which includes reduction policies and measures in seven sectors (industry, transportation, buildings, public sector, agriculture, waste, and power generation).

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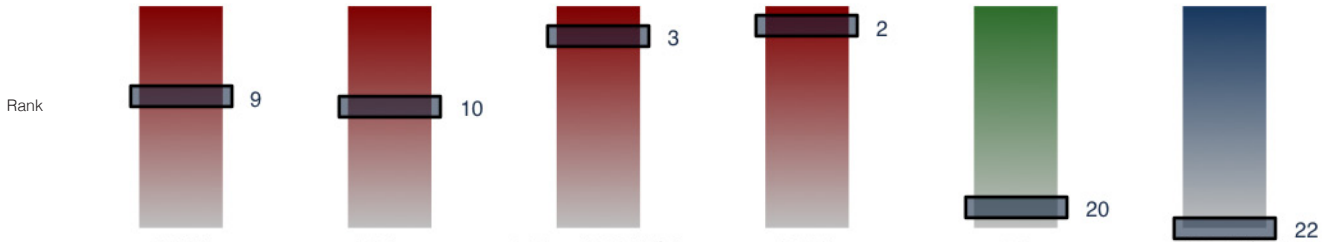
IRAN

	Value°	Rank *
Population:	75 mio	11
Annual population growth:	1.1 %	7
GDP per capita:	4'526 US$/capita	19
Fossil fuel resources:	528 tC/capita	7

* among the 22 largest emitters

INDICATORS°

	Total CO_2 emissions~	GHG emissions# per capita	Energy intensity in manufacturing	Electricity from coal, gas & oil	Forest area	Motor fuel price+
Value	579 Mt	9.5 t/cap	1.47 toe/1000 US$ **	95.8 %	7 %	0.06 US$/l
Change		+36%	-18%	-1.1%	±0.0%	
Rank	9	10	3	2	20	22



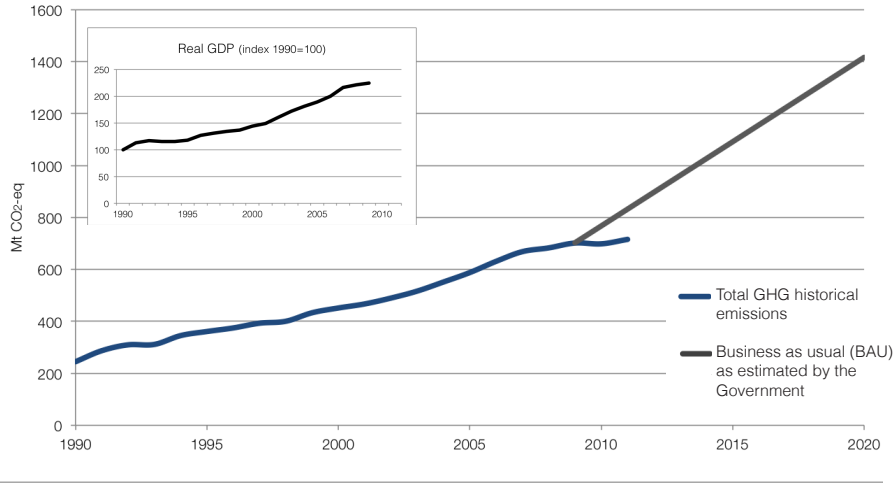
Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF

+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Pledge:

No pledge.

DOMESTIC POLICIES

Iran encourages fuel substitution from oil to natural gas. It has the second largest natural gas reserves in the world.

Domestic energy prices are generally below world market prices, although recently some fuel prices have almost doubled. The Government plans to reform energy prices, but at the same time refers to difficulties that this can create concerning "household welfare".

Iran´s Climate Change Office enables Iran to prepare its National Communication to the UNFCCC.

09 Sept. 2014

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° Generally 2011 data.
For details, see: "Sources for country fact sheet information"

Econability
Sustainable Economics in Research and Practice

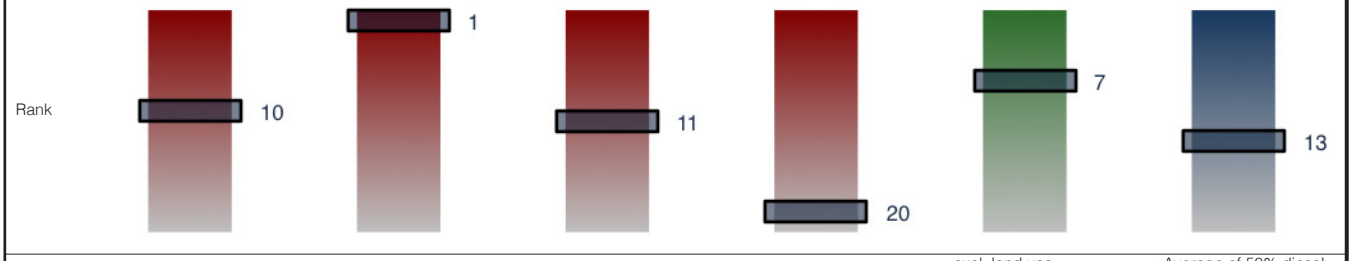
CANADA

	Value°	Rank *
Population:	34 mio	20
Annual population growth:	1.0 %	8
GDP per capita:	50'345 US$/capita	2
Fossil fuel resources:	778 tC/capita	4

* among the 22 largest emitters

INDICATORS°

	Total CO_2 emissions~	GHG emissions# per capita	Energy intensity in manufacturing	Electricity from coal, gas & oil	Forest area	Motor fuel price+
Value	539 Mt	22.6 t/cap	0.37 toe/1000 US$ **	24.2 %	34 %	1.15 US$/l
Change		+5%	-7%	-2.5%	±0.0%	
Rank	10	1	11	20	7	13



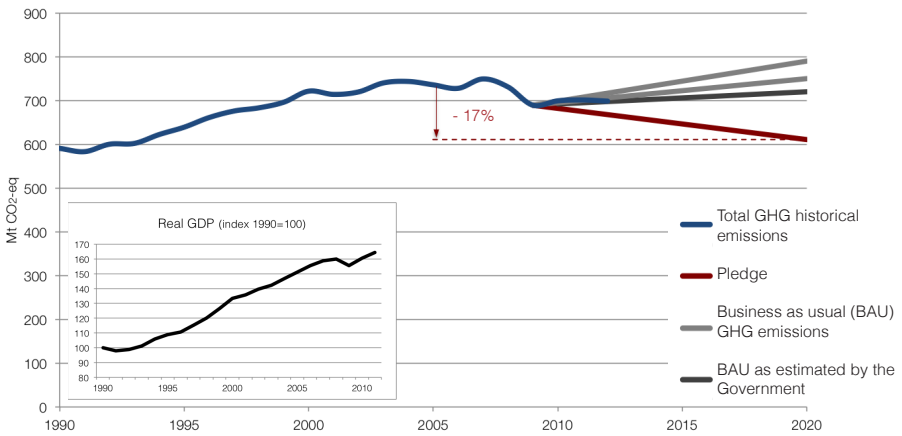
Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF

+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU taken from Ecofys et al. 2012. BAU as estimated by the Government contains existing measures. For Canada, the fact that the land use, land use change and forestry (LU-LUCF) sector is a large sink and uncertainties around LULUCF accounting methods imply that the pledge could be less stringent than it appears here.

Pledge (non-legally binding):

17% emission reduction by 2020 compared with 2005 levels, to be aligned with the final economy-wide emission reduction target of the United States of America in enacted legislation.

DOMESTIC POLICIES

In December 2011, Canada withdrew from the Kyoto Protocol (KP) and repealed the Act that had been setup to implement the KP targets. Attempts to pass new comprehensive climate legislation had no success. Canada harmonizes its regulatory framework with the United States to avoid competitive disadvantages in the North American Free Trade zone.

Since 2010, Canada requires a minimum average renewable fuel content of 5%. In 2012, it implemented performance standards on coal-fired power plants. It is estimated that, as a consequence, 75% of coal-fired power plants will need to retrofit CCS to continue operations after 2025. Recently, tighter regulations for new heavy duty trucks, aligned with the US emission standards, have entered into effect.

Several Canadian Provinces introduced more ambitious climate legislation: There is a cap-and-trade emissions trading scheme in the three Provinces Ontario, Quebec, and British Columbia, which encompass about 75% of the Canadian population. British Columbia and Quebec also have a carbon tax and vehicle fuel efficiency standards that are aligned with Californian regulations. Ontario passed a Green Energy and Green Economy Act that promotes energy efficiency and renewables (through a feed-in tariff) with the targets to reduce emissions by 15% in 2020 and 80% in 2050 w.r.t. 1990. Alberta has set a target of reducing emissions intensity by 50% by 2050 by improving energy efficiency, introducing CCS and renewable energy. Nova Scotia has an absolute cap on emissions from electricity generation.

09 Sept. 2014

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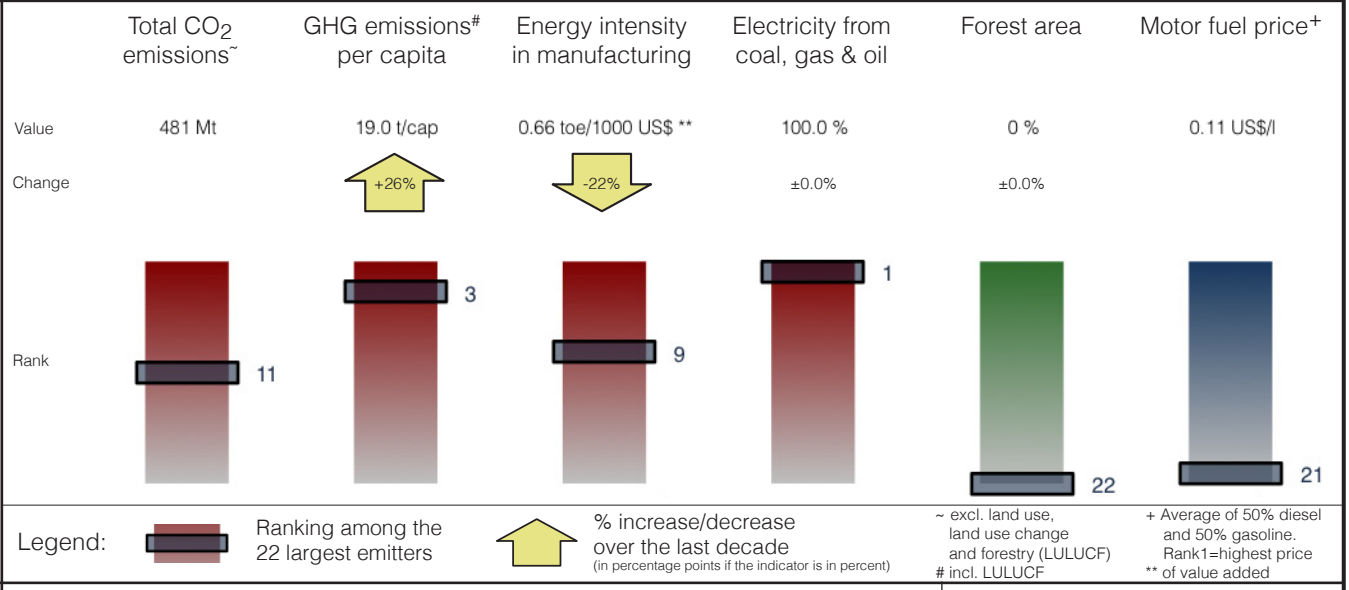
Econability Sustainable Economics in Research and Practice

SAUDI ARABIA

	Value°	Rank *
Population:	28 mio	21
Annual population growth:	2.3 %	1
GDP per capita:	20'540 US$/capita	11
Fossil fuel resources:	1'325 tC/capita	2

* among the 22 largest emitters

INDICATORS°



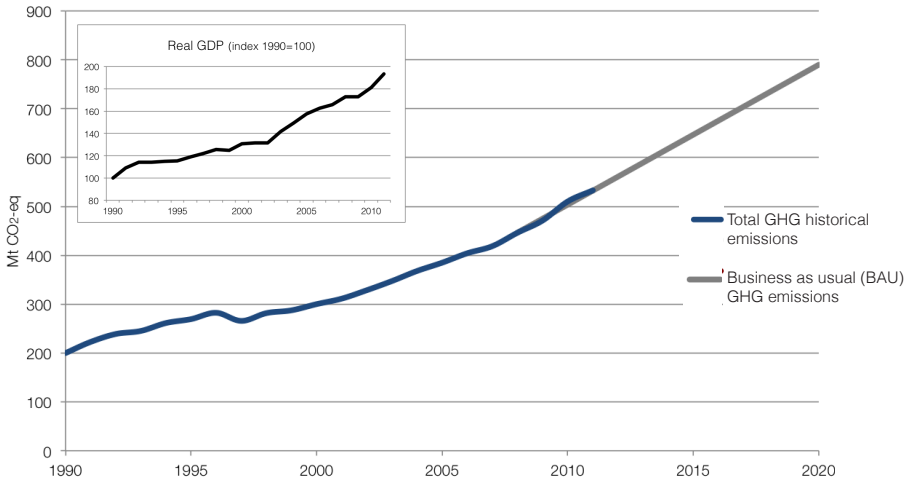
Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF

+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projection from Ecofys et al. 2012.

Pledge:

No pledge.

DOMESTIC POLICIES

In 2011, Saudi Arabia announced plans to build 16 nuclear power stations over the next 20 years. The first two are scheduled to produce energy after 10 years, followed by two more every year until 2030. Saudi Arabia has the objective to achieve a share of renewable energy in electricity generation of 23% in 2030 (10% in 2020), starting from 0% in 2009.

Saudi Arabia strives to diversify its economy to reduce dependence of fossil fuel exports. The National Energy Efficiency Programme (NEEP) combines many activities and measures to enhance energy efficiency. Saudi Arabia is a member of the Global Gas Flaring Reduction Partnership, which is led by the World Bank.

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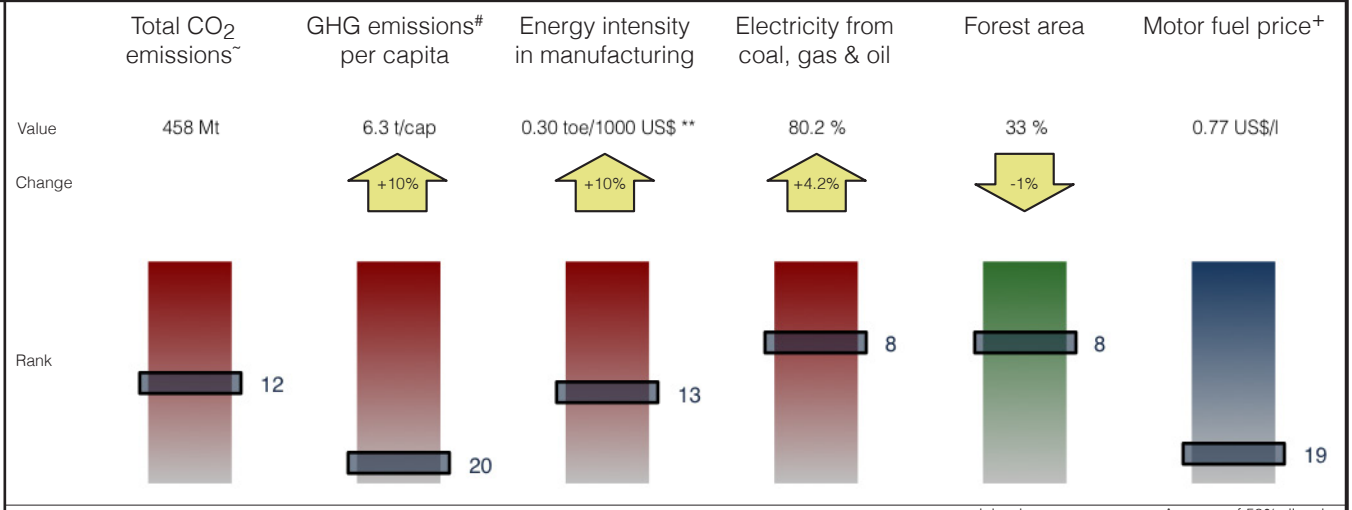
Econability Sustainable Economics in Research and Practice

MEXICO

	Value°	Rank *
Population:	115 mio	9
Annual population growth:	1.2 %	5
GDP per capita:	10'047 US$/capita	16
Fossil fuel resources:	21 tC/capita	17

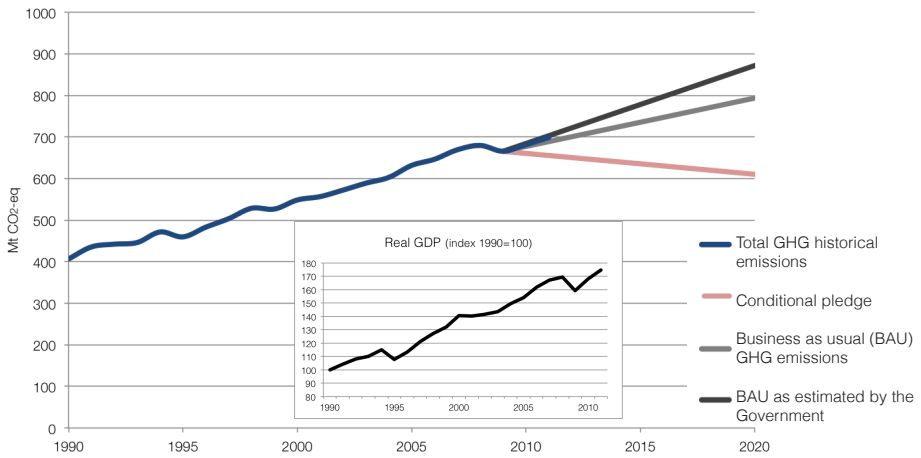
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projection comes from the Climate Action Tracker 2011. We calculated the absolute emissions that the pledge represents as a 30% reduction from BAU as estimated by the Government. Absolute emissions for pledges that are based on BAU projections are inherently uncertain, because BAU emissions may be subject to change.

Pledge (non-legally binding):

Up to 30% emissions reduction compared with the 'business as usual' scenario by 2020.

Full implementation of its Special Climate Change Programme, adopted in 2009, would achieve a reduction in total annual emissions of 51 Mt CO_2-eq by 2012, compared with the 'business as usual' scenario.

The achievement of the target is subject to the provision of adequate financial and technological support from developed countries as part of a global agreement.

DOMESTIC POLICIES

The General Law on Climate Change was adopted in 2012. It entails institutional reforms and emphasizes adaptation. In terms of mitigation, the first step, which precedes the implementation of mitigation activities, is to strengthen capacities. The 2013 National Climate Change Strategy formulates a 10-20-40 vision which sets goals for the next 10, 20 and 40 years. Objectives for the next 10 years include 35% electricity generation from clean sources.

In 2007, a law was passed to promote bioenergy. In 2009, a renewable energy fund of 3 billion Mexican Pesos (about 225 million US$) was created. The Special Climate Change Program 2009-2012 provided a large number of objectives and actions that are necessary to achieve the long-term goal of reducing GHG emissions by 50% in 2050 relative to 2000.

Mexico has created a framework to prevent deforestation and forest degradation. The concept of Environmental Services Payments to forest owners is central in this respect, and it is connected to the international REDD+ mechanism, which Mexico has prepared itself for. Emphasis is made on the principle "who conserves is paid".

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Econability
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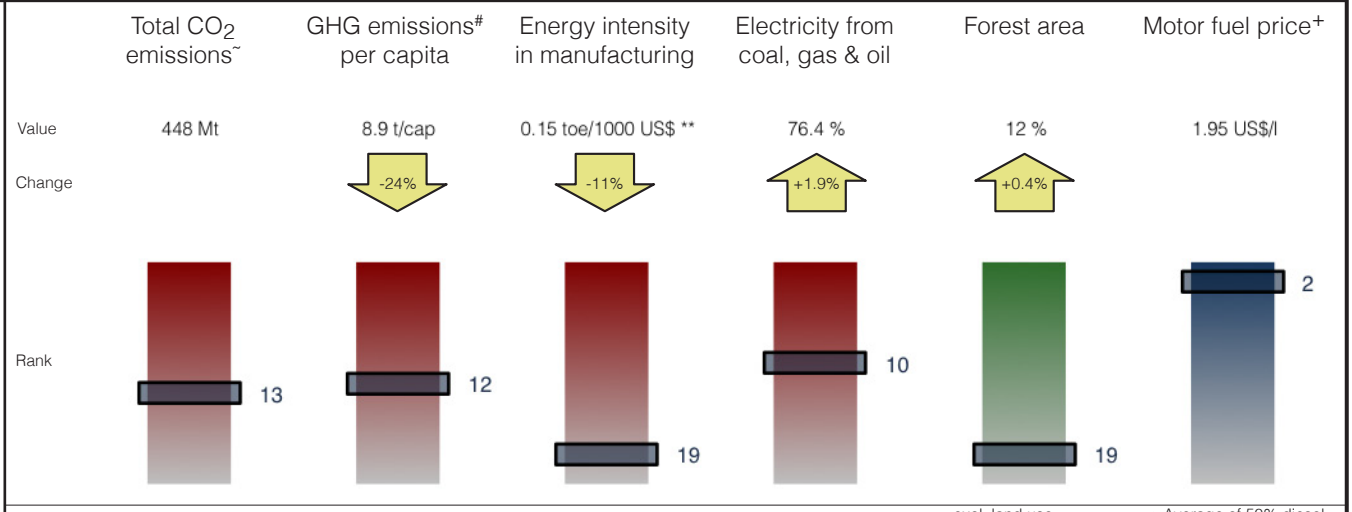
UK

	Value°	Rank *
Population:	63 mio	14
Annual population growth:	0.7 %	13
GDP per capita:	39'038 US$/capita	7
Fossil fuel resources:	11 tC/capita	18

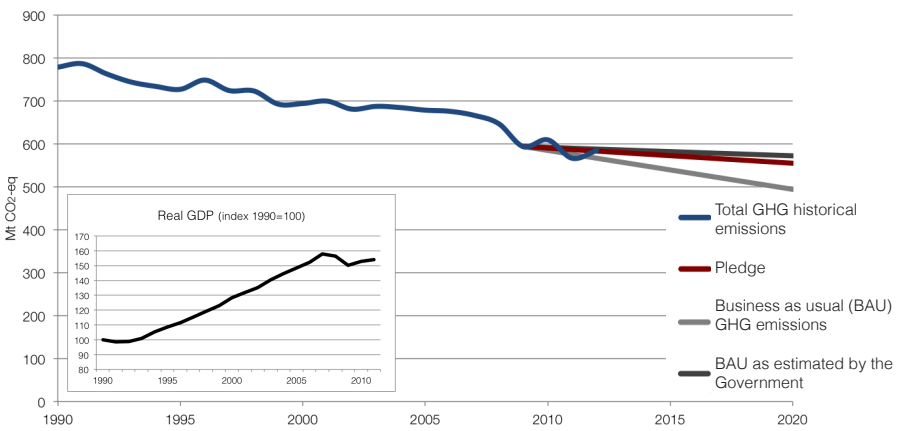
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), the UK´s GHG emission reduction in 2020 w.r.t. 2005 is -18%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

The United Kingdom participates in the legally binding EU commitment (ratification pending).
The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990
(conditional pledge: -30%).

In an EU-wide effort sharing decision, The UK has committed itself to a reduction of -16% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 57% of total emissions in the United Kingdom. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

With the Climate Change Act from 2008, the UK possesses a long-term climate policy framework. It sets carbon budgets for 5-year periods. So far, Parliament has approved the budgets for the first four periods, implying e.g. a legally established greenhouse gas emission reduction of 50% by 2027 relative to 1990 (which may include the purchase of foreign carbon credits). The respective target for 2020 is -34%, which is somewhat more ambitious than the international target and supported by a broad set of measures.
As an EU Member State, the UK takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.
In 2012, the UK founded a Green Investment Bank with a capital of £3 billion. A climate change levy applies to fossil fuels and electricity for lighting, heating and power in business and the public sector. Energy intensive firms earn an 80% discount on the levy if they meet predefined targets. A floor price for carbon of £16 per ton was introduced by 1 April 2013 in the electricity sector. It is to be gradually increased to £30 in 2020 and £70 in 2030.
The Energy Efficiency Scheme is a trading scheme for emission allowances covering organisations that are below EU ETS thresholds, but have an annual electricity consumption above 6´000 MWh. The Green Deal provides loans for energy saving measures in UK real estate properties. The Community Energy Saving Programme targets energy efficiency in low-income households.
The UK has the target of 15% of energy coming from renewable sources by 2020. Policies that work toward this goal include renewable obligations for licensed electricity suppliers, feed-in tariffs for small scale low-carbon electricity, a heat-related Bio-energy Capital Grants Scheme and a Renewable Transport Fuels Obligation.
In late 2012, an Energy Bill was introduced into Parliament, which, when adopted, establishes tighter emissions performance standards for fossil fuel-based power plants (with the goal to prevent new coal-fired power plants without carbon capture and storage) and more attractive conditions for renewables.

09 Sept. 2014

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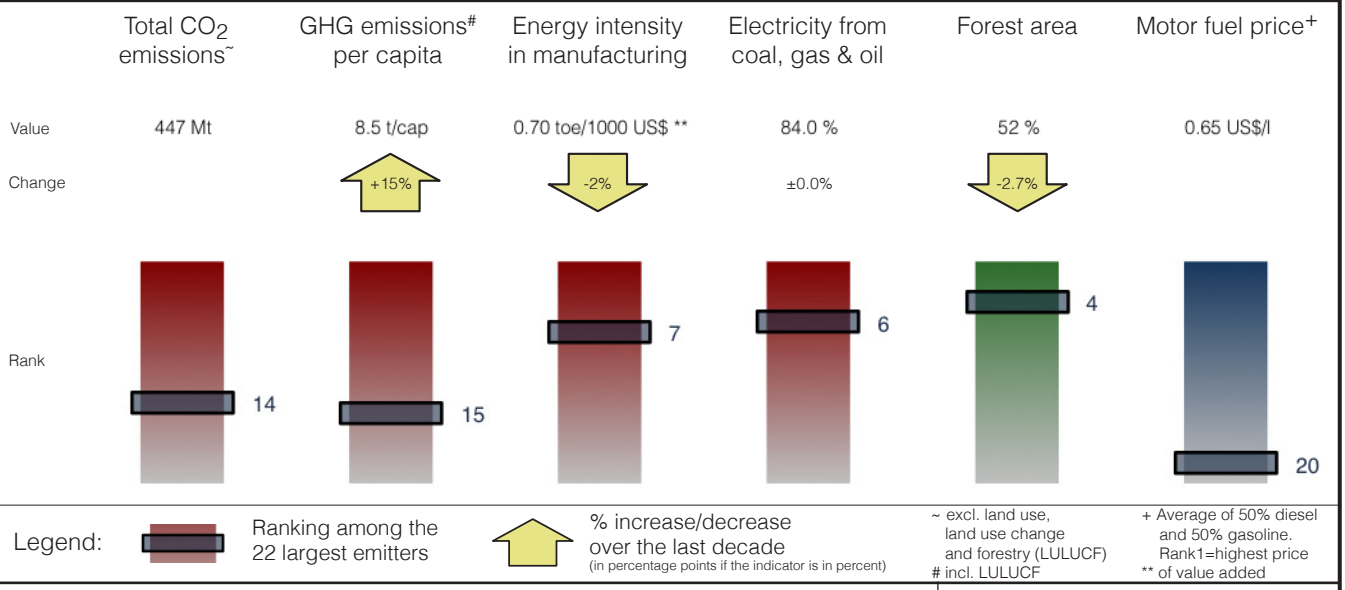
INDONESIA

	Value°	Rank *
Population:	242 mio	5
Annual population growth:	1.0 %	9
GDP per capita:	3'495 US$/capita	21
Fossil fuel resources:	29 tC/capita	14

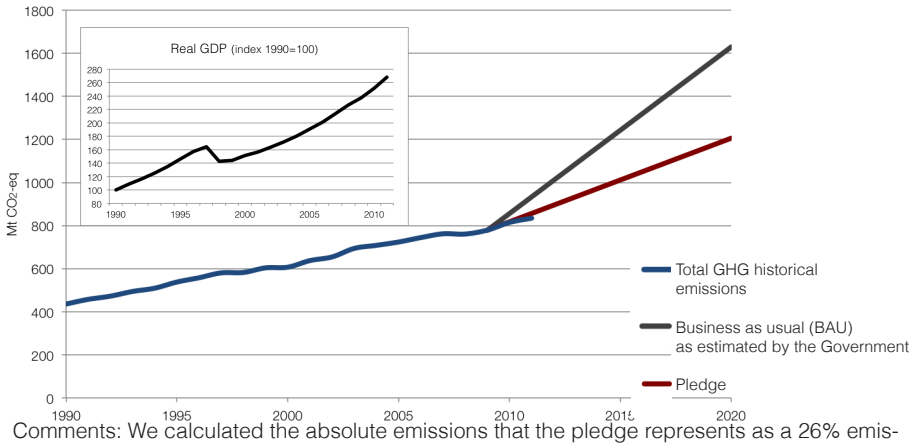
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: We calculated the absolute emissions that the pledge represents as a 26% emission reduction from the BAU as estimated by the Government. Absolute emissions for pledges that are based on BAU projections are inherently uncertain, because BAU emissions may be subject to change. Indonesia has sizeable land use, land use change and forestry net emissions (approximately 150% of GHG excl. LULUCF), which are not included in the graphic above. Including LULUCF emissions, Indonesia would be the 5th largest emitter in the world.

Pledge (non-legally binding):

Indonesia's voluntary nationally appropriate mitigation actions (NAMAs) will reduce GHG emissions by 26% by 2020 in relation to business as usual scenario.

The related national action plan would be equipped with a measurable, reportable and verifiable system in order to ensure that each action receives the necessary level of funding.

DOMESTIC POLICIES

Next to its 26% pledge, Indonesia has set a more ambitious national reduction target for 2020 of 41% relative to business as usual, conditional on adequate international support.

Deforestation and forest degradation is the main source of GHG emissions in Indonesia. Net emissions from land use, land use change and forestry accounted for 60% of GHG emissions in 2000. The majority of logging activities are illegal. In many cases, deforestation occurs on carbon-rich peat lands, leading to further carbon release, methane emissions and peat fires. Norway pledged US$1 billion to help GHG reduction from deforestation and forest degradation, conditional to project monitoring. Both countries agreed to put a halt to the allocation of new forestry licences and peat land development for two years starting May 2011.

Indonesia has set a renewable energy target of 25% by 2025. Increasing the capacity of geothermal energy is one important means to meet this target. The other is an objective to supply 5% of energy demand with biofuels in 2025. Opposition to these initiatives is coming from the potential conflict with forest conservation objectives: 80% of geothermal sources are located in conservation forests; In many cases, lands are deforested for palm oil plantations.

Indonesia grants tax exemptions and other fiscal incentives for imports of energy saving equipment. It also provides loans with reduced interest rates on investments in energy conservation. Further initiatives deal with restructuring prices, tariffs and taxes for various energy sources.

09 Sept. 2014

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Econability
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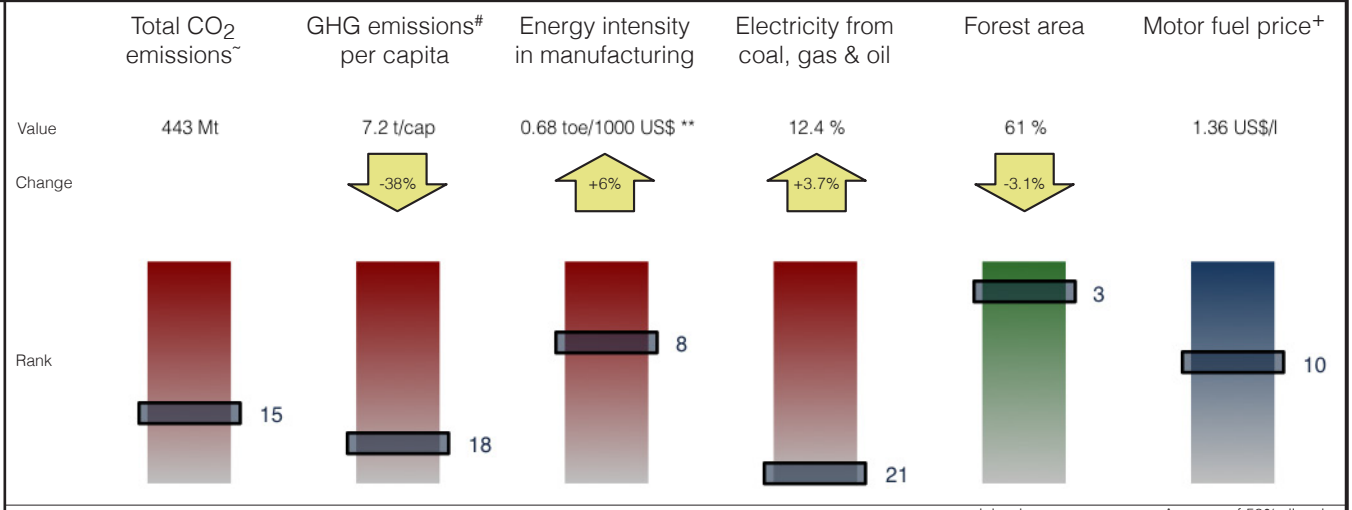
BRAZIL

	Value°	Rank *
Population:	197 mio	6
Annual population growth:	0.9 %	10
GDP per capita:	12'594 US$/capita	14
Fossil fuel resources:	27 tC/capita	15

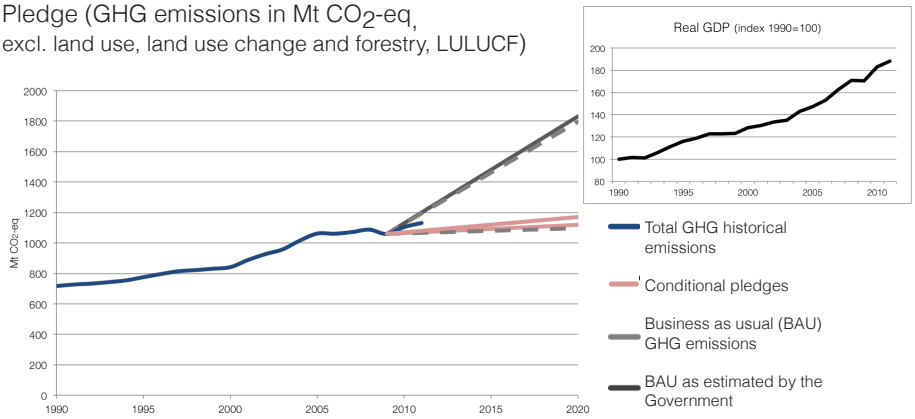
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry, LULUCF)



Comments: Emissions from LULUCF are crucial for understanding Brazil's pledge. However, due to data uncertainties, our graphs do not include LULUCF emissions. In National Decree n°7390, 2010, Brazil defined a BAU scenario with very high LULUCF emissions. Ecofys et al. 2012, depicts a BAU range including LULUCF emissions. We subtracted the 2020 LULUCF emissions from Decree 7390 from all BAUs. We calculated the absolute emissions that the pledges represent as 36.1% and 38.9% emission reduction from the BAU as estimated by the Government. Absolute emissions for pledges that are based on BAU projections are inherently uncertain, because BAU emissions may be subject to change.

Pledge (non-legally binding):

Brazil anticipates its mitigation actions to lead to emission reductions of 36.1-38.9% by 2020, compared to business as usual.

Actions are voluntary in nature and dependent on financial support to be provided by developed Parties.

DOMESTIC POLICIES

Brazil generates more than 80% of its electricity from renewable sources and aims at keeping this share until 2030. Hydropower is traditionally of great importance, but other renewable sources are projected to increase their share. Brazil is a key player in the development of biofuels. In 2008, bioethanol demand exceeded petrol demand. A biodiesel target is set at 20% for 2020.

Energy efficiency policies include mandatory efficiency labels, energy efficiency standards for buildings and equipment, and energy efficiency programs targeting electricity and fossil fuels. Utilities are obliged to invest 0.25% of their revenues into measures to improve energy efficiency.

Avoiding deforestation and reducing other net emissions from land use and land use change are other main issues of Brazilian climate policy, since the related net emissions amounted to 61% of total GHG emissions in 2005. The National Plan on Climate Change from 2008 sets the goal to reduce deforestation by 80% until 2020. Due to the vastness especially of the Amazon forests, nationwide enforcement of forest conservation laws is a major challenge. A reform of the forest code in 2012 has earned criticism by environmental NGOs for weakening forest protection.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

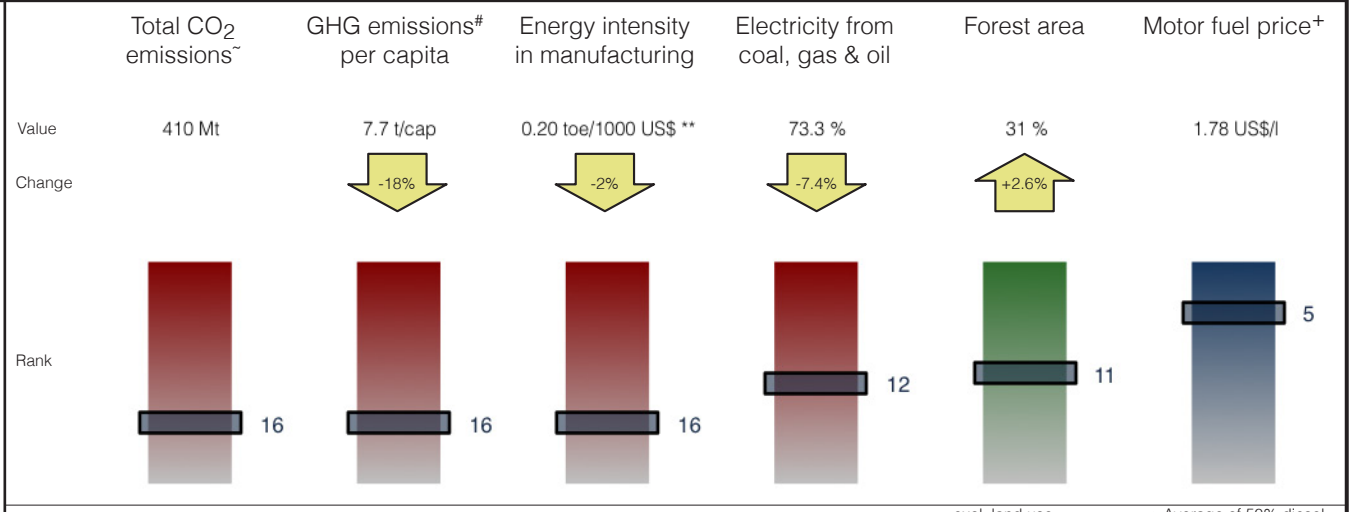
Econability Sustainable Economics in Research and Practice

ITALY

	Value°	Rank *
Population:	61 mio	15
Annual population growth:	0.5 %	15
GDP per capita:	36'103 US$/capita	8
Fossil fuel resources:	2 tC/capita	21

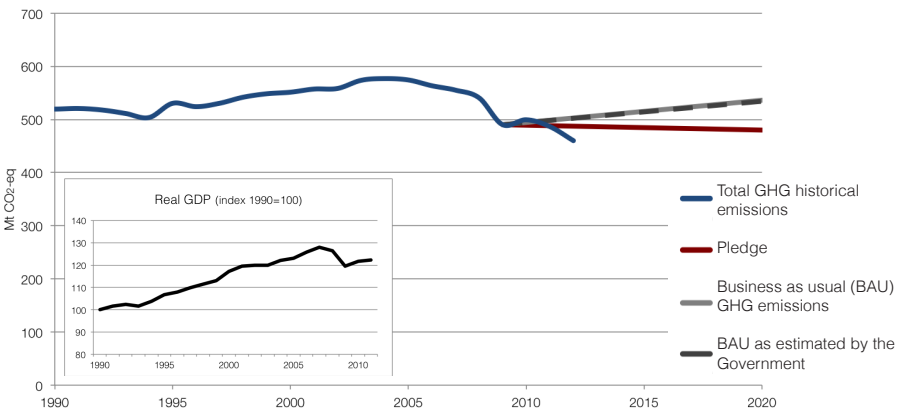
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. The current recession is not taken into account in the BAU. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Italy´s GHG emission reduction in 2020 w.r.t. 2005 is -16%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Italy participates in the legally binding EU commitment (ratification pending).
The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990
(conditional pledge: -30%).

In an EU-wide effort sharing decision, Italy has committed itself to a reduction of -13% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 57% of total emissions in Italy. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, Italy takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.
A preexisting carbon tax was abrogated in 2002. Italy´s strategy for GHG emission reduction has relied heavily on emission reductions from abroad through EU emissions trading and the flexible mechanisms of the Kyoto Protocol.
A reforestation plan had been announced, but with only rudimentary implementation so far. The same applies to the Climate Change Action Plan that was announced in 2007.
Energy efficiency issues are addressed via several measures such as fiscal incentives and funds, adopting EU legislation (e.g. on the performance of buildings), as well as by a white certificates trading scheme that was put into place in 2005 to help customers save energy. Under this scheme, all electricity and gas distributors trade white certificates of certified energy savings to meet their saving targets.
A Green Certificates System was adopted to increase the share of energy supply from renewable sources. Italy also introduced a feed-in tariff for electricity from photovoltaic systems. More incentives for renewables exist at a regional level.
Austerity measures following the economic crisis have led to distinct cuts in subsidies.
In 2007, a national target of 5.75% of biofuels by 2010 was established. Italy has incentives for car sharing, and city governments are reimbursed up to 65% of the cost of adding environmentally friendly vehicles to their fleet.

09 Sept. 2014

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° Generally 2011 data.
For details, see: "Sources for country fact sheet information"

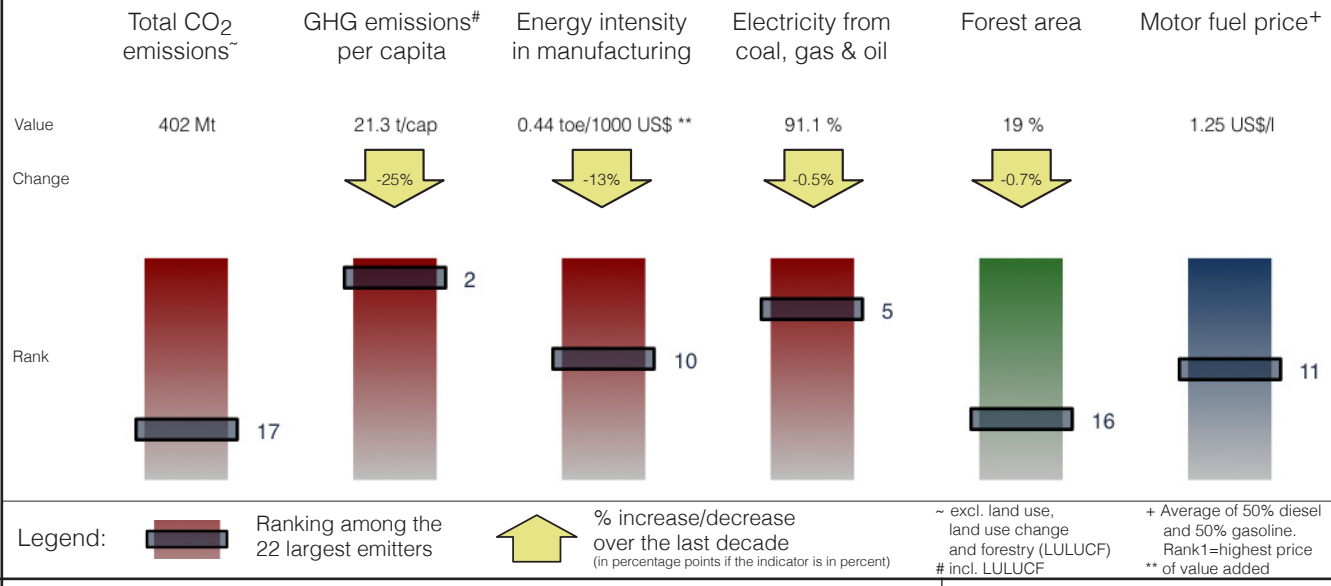
Econability
Sustainable Economics in Research and Practice

AUSTRALIA

	Value°	Rank *
Population:	23 mio	22
Annual population growth:	1.4 %	2
GDP per capita:	60'979 US$/capita	1
Fossil fuel resources:	2'478 tC/capita	1

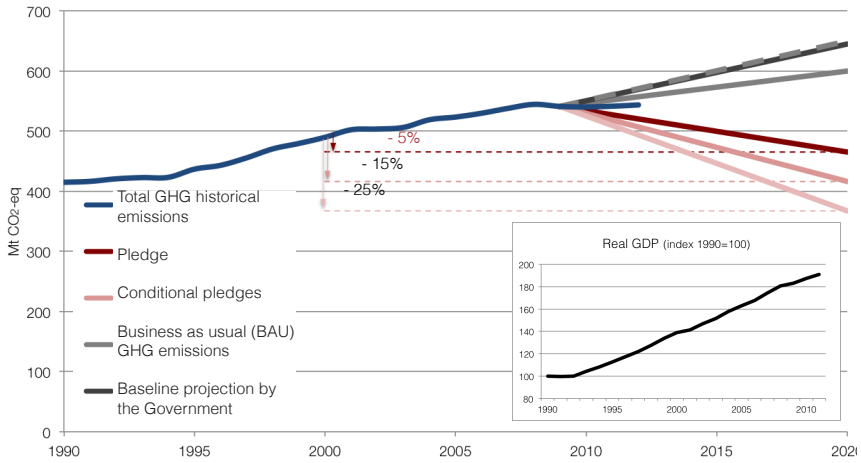
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections from Ecofys et al. 2012. Baseline projection from the Government includes existing policies and measures. For Australia, the fact that the land use, land use change and forestry (LULUCF) sector is a large sink and uncertainties around LULUCF accounting methods imply that the pledge could be less stringent than it appears here.

Pledge (legally binding):
Reduction of GHG emissions of 5% from 2000 levels by 2020.
Conditional pledges (non-legally binding):
Reduction of GHG emissions by up to 15% from 2000 levels by 2020 if there is a global agreement under which major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's and which falls short of securing atmospheric stabilisation at 450 ppm CO_2-eq. Reduction of GHG emissions by 25% on 2000 levels by 2020 in case of a global deal capable of stabilising levels of greenhouse gases in the atmosphere at 450 ppm CO_2-eq or lower.

DOMESTIC POLICIES

Australia introduced a carbon tax for large emitters (> 25'000 t CO_2-eq/year) of 23 Australian Dollars (about EUR 17) per ton of CO_2 equivalent starting July 2012, rising by 2.5% per year in real terms. This tax was to be replaced by an emissions trading scheme (ETS) in 2015 that was scheduled to be linked to the European ETS no later than 2018. However, the Australian Government is currently repealing the carbon tax and the ETS.

As replacement for the carbon tax, an Emissions Reduction Fund endowed with AUD 2.55 bn.= EUR 1.84 bn. for its first three years of operation is being discussed at the present. It is designed to buy CO_2 emissions reduction credits from companies of different sectors including industry.

Australia aims at raising the share of renewable sources in electricity supply from 7% to 20% between 2011 and 2020. Since 2010, electricity retailers need to purchase renewable energy certificates. A ban for conventional light bulbs started in 2009. A Green Buildings Programme involving tax exemptions was adopted in 2012.

The Carbon Credits Act offers opportunities for farmers, landowners and forest growers to receive marketable carbon credits for storing carbon or reducing emissions. In addition, a biodiversity fund of 1 billion Australian Dollars exists.

09 Sept. 2014

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° Generally 2011 data.
For details, see: "Sources for country fact sheet information"

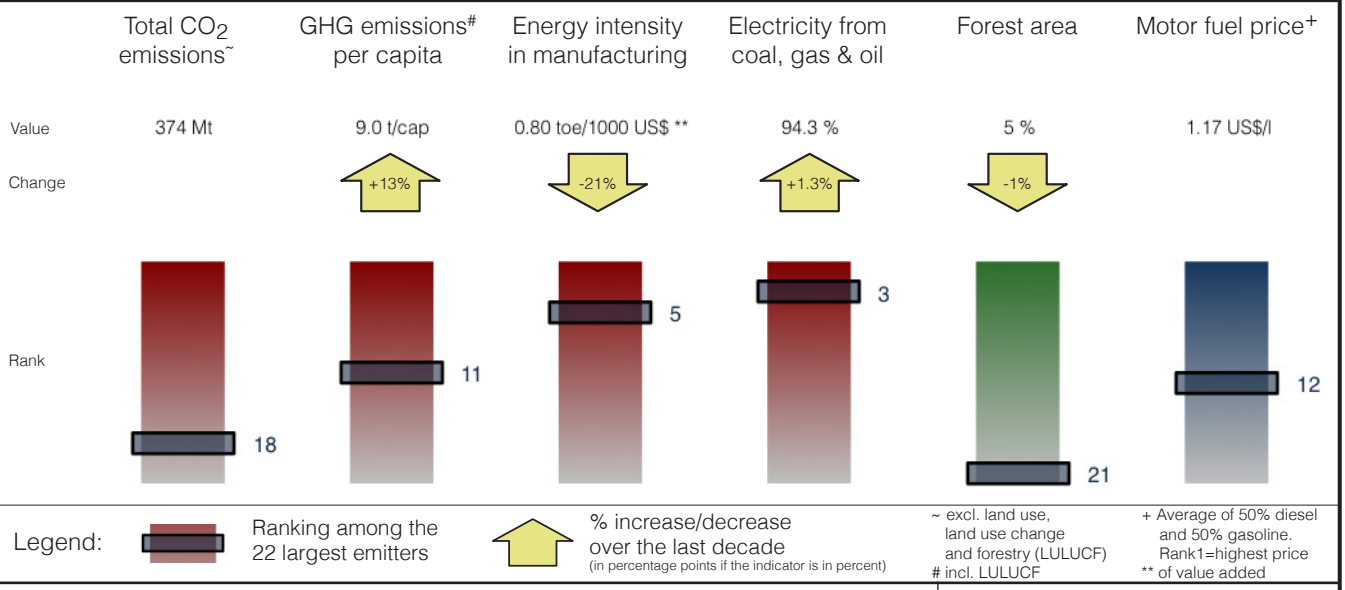
Econability
Sustainable Economics in Research and Practice

SOUTH AFRICA

	Value°	Rank *
Population:	51 mio	16
Annual population growth:	1.2 %	6
GDP per capita:	8'070 US$/capita	17
Fossil fuel resources:	432 tC/capita	8

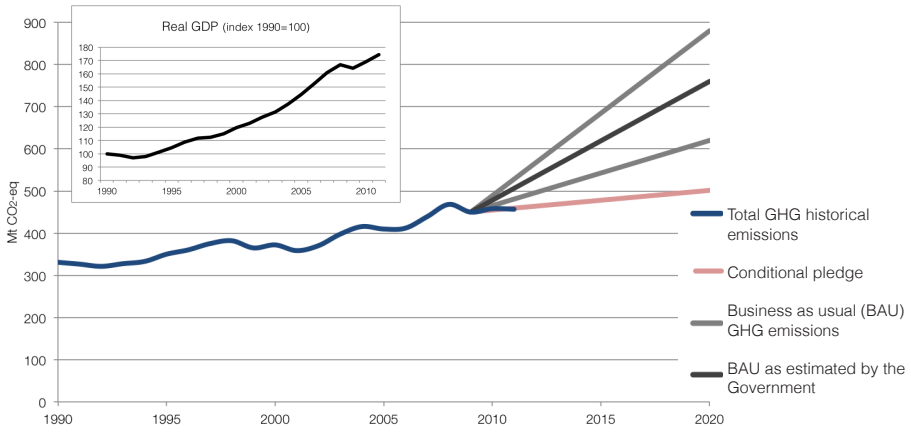
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU spread from Department of Environmental Affairs of the Republic of South Africa as cited by Ecofys et al. 2012. We calculate the absolute emissions that the pledge represents as a 34% reduction from the BAU given by the Government. The BAU scenario provided by the Government in its National Communication to the UNFCCC is only put forward graphically for 2020, which makes our representation of the pledge somewhat imprecise. Absolute emissions for pledges that are based on BAU projections are inherently uncertain, because BAU emissions may be subject to change.

Pledge (non-legally binding):

Nationally appropriate mitigation action for a 34% deviation from business as usual by 2020 and 42% by 2025.

The extent to which this action will be implemented will depend on the provision of financial resources, the transfer of technology and the capacity-building support provided by developed countries and therefore requires the finalization of an ambitious, fair, effective and binding multilateral agreement under the UNFCCC and its Kyoto Protocol.

DOMESTIC POLICIES

South Africa pursues to let emissions peak between 2020 and 2025, stabilize for about a decade, and then begin to decline. The National Climate Change Response Policy from 2011 established a general framework for domestic climate policy. The emissions target was incorporated in the latest update of the Integrated Resource Plan for Electricity in 2013, which anchored mitigation in energy policy more firmly.

In 2010, a CO_2 tax on passenger vehicles was introduced, adding 75 Rand (about 8 US$) to the vehicle price for every gram of CO_2 per kilometre the vehicle emits over 120 g/km.

The Government plans to introduce a carbon tax of 120 Rand (about 14 US$) per ton starting in January 2016. A 60 percent tax-free threshold could be set on annual emissions until 2020, as proposed by the Treasury. Higher tax-free thresholds could apply to emission-intensive and trade-exposed industries like cement, iron and steel, aluminium and glass. Increases in the tax-free threshold will also apply to companies that invest into external green projects.

09 Sept. 2014

Support has been provided by the Swiss Federal Office for the Environment FOEN.

This fact sheet has not been approved by the respective Government.

° Generally 2011 data. For details, see: "Sources for country fact sheet information"

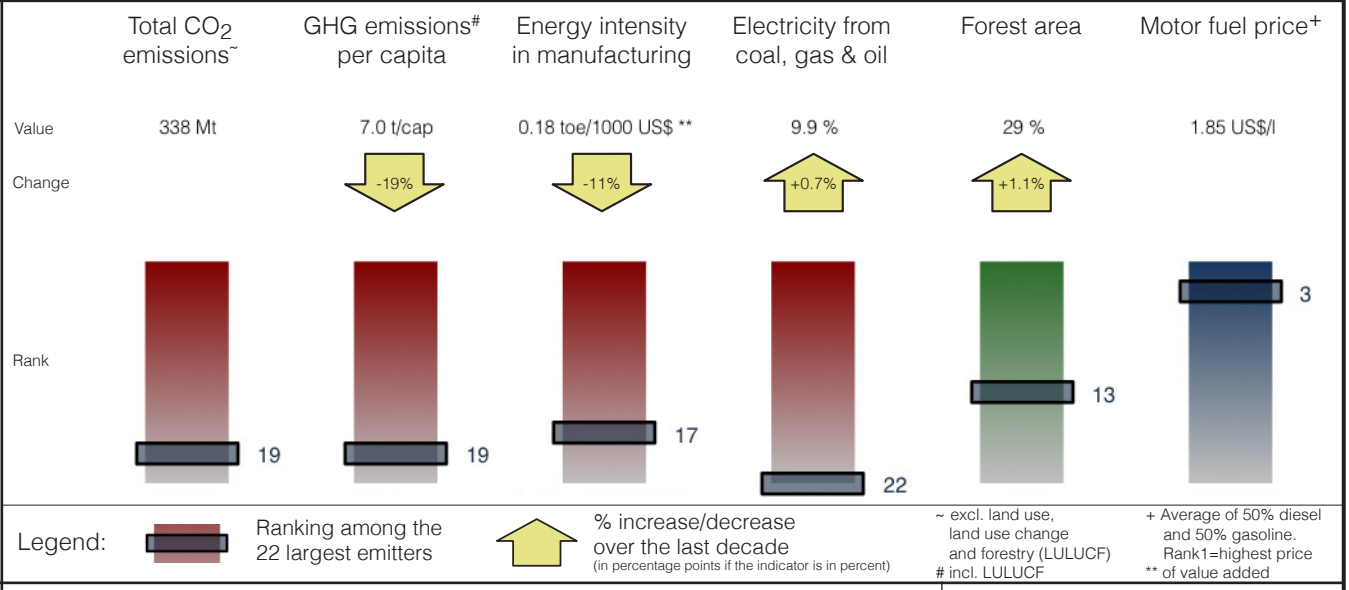
Econability
Sustainable Economics in Research and Practice

FRANCE

	Value°	Rank *
Population:	65 mio	13
Annual population growth:	0.6 %	14
GDP per capita:	42'377 US$/capita	6
Fossil fuel resources:	0 tC/capita	22

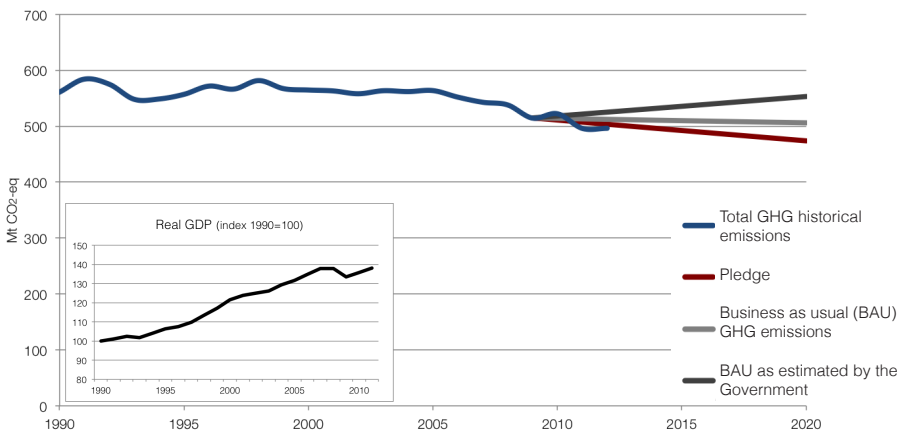
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), France´s GHG emission reduction in 2020 w.r.t. 2005 is -16%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

France participates in the legally binding EU commitment (ratification pending).
The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990
(conditional pledge: -30%).

In an EU-wide effort sharing decision, France has committed itself to a reduction of -14% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 71% of total emissions in France. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, France takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

France has feed-in tariffs for electricity from renewable sources. Utilities are obliged to reach saving standards through their customers and take part in a White Certificates Program.

Use of renewable energy in the buildings sector is promoted by a wide array of measures including tax deductions and a loan program. In 2013, the RT2012 regulation tightened the energy standards for new buildings (50 kWh of primary energy consumption per sqm). After 2020, only “zero energy” new buildings will be allowed, i.e. they may not use more primary energy than they generate themselves from renewable sources.

The Government provides support for biofuels (target: 10% in 2020). A bonus-malus system is intended to further improve the CO_2 efficiency of new cars, which is already second best in Europe.

France claims that its policies will permit a CO_2 emission reduction of close to -23% in 2020 compared to 1990 levels. It intends to cut its CO_2 emissions by four until 2050.

09 Sept. 2014

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° Generally 2011 data.
For details, see: “Sources for country fact sheet information”

Econability
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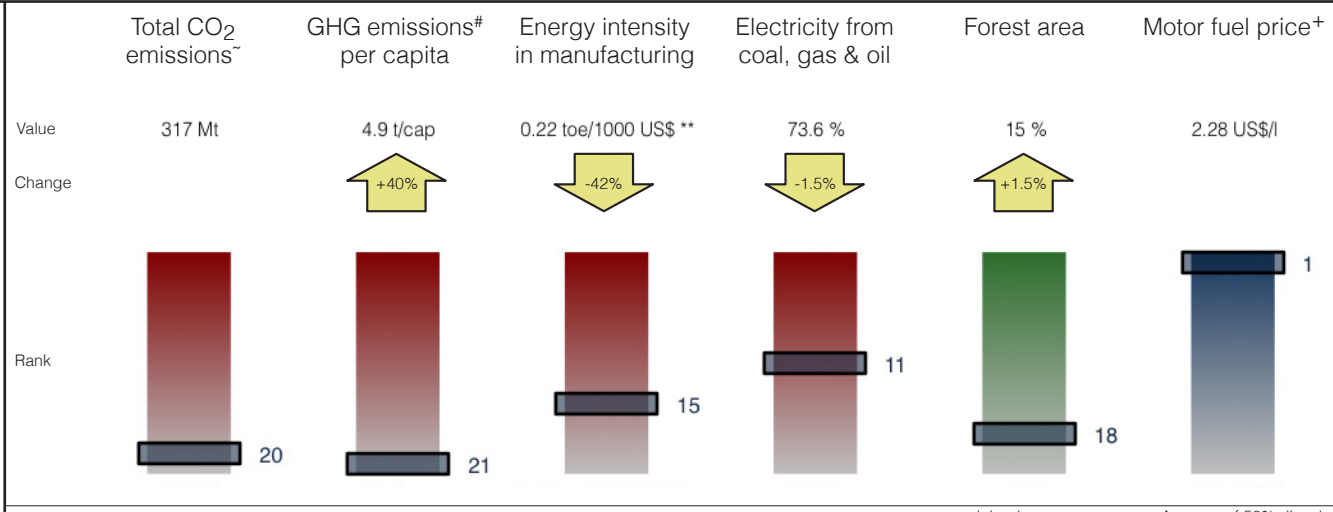
TURKEY

	Value°	Rank *
Population:	74 mio	12
Annual Population growth:	1.2 %	4
GDP per capita:	10'524 US$/capita	15
Fossil fuel resources:	24 tC/capita	16

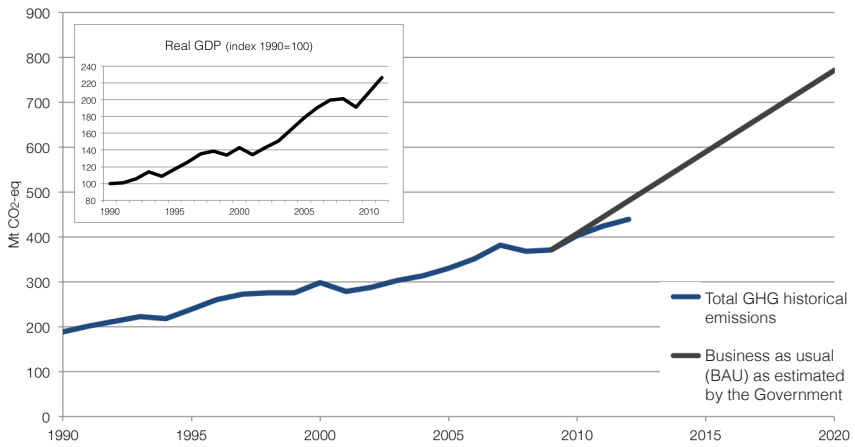
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: Turkey is formally an Annex I country, but did not have a reduction target according to Annex B of the Kyoto Protocol for the first Commitment Period. The BAU put forward in the National Communication to the UNFCCC (2007) entails only CO_2 emissions. We scaled it up assuming a constant ratio between CO_2 and total GHG emissions.

Pledge:

No pledge.

DOMESTIC POLICIES

The National Climate Change Strategy 2010-2020 lists intended policies measures for greenhouse gas emission control in the areas energy, transportation, waste, and land use. They are structured into short, medium and long term measures.

The Renewable Energy Law from 2005 promotes electricity generation from renewable sources. It obliges retailers to purchase a certain ratio of their electricity from renewable sources. It also promotes renewable sources in other ways, e.g. by facilitating the use of state-owned land and by securing grid connection priority.

Turkey has the highest motor fuel prices among the 22 top CO_2 emitters.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

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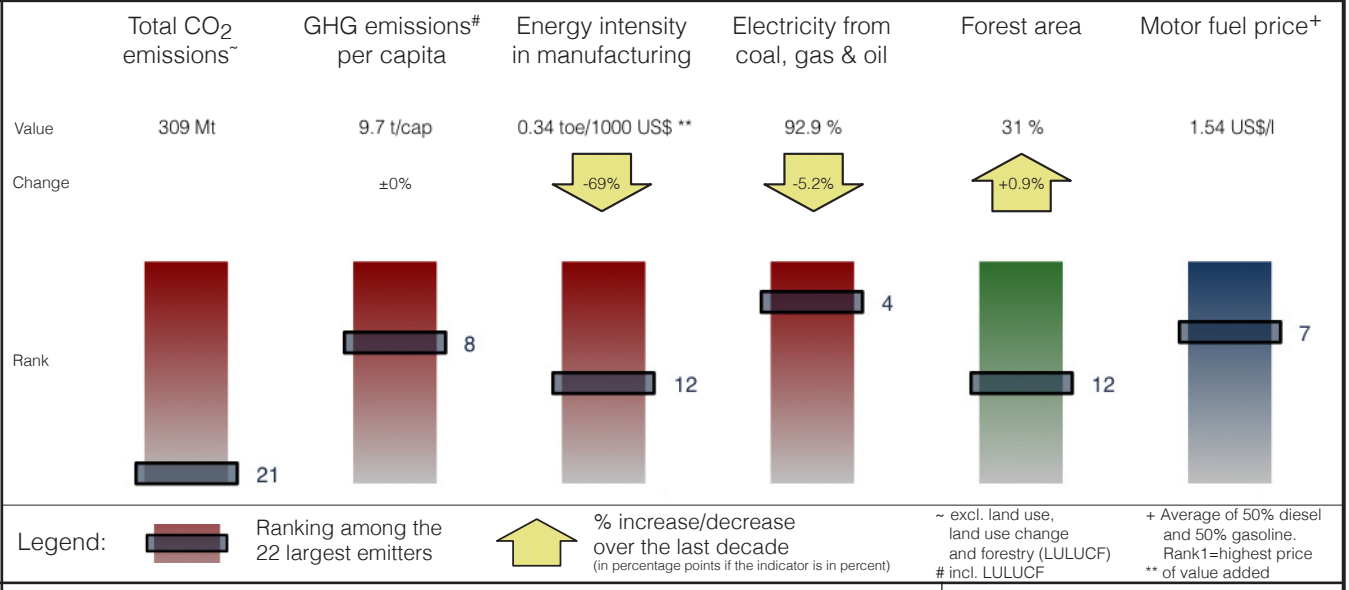
POLAND

	Value°	Rank *
Population:	38 mio	19
Annual population growth:	0.1 %	19
GDP per capita:	13'463 US$/capita	12
Fossil fuel resources:	110 tC/capita	10

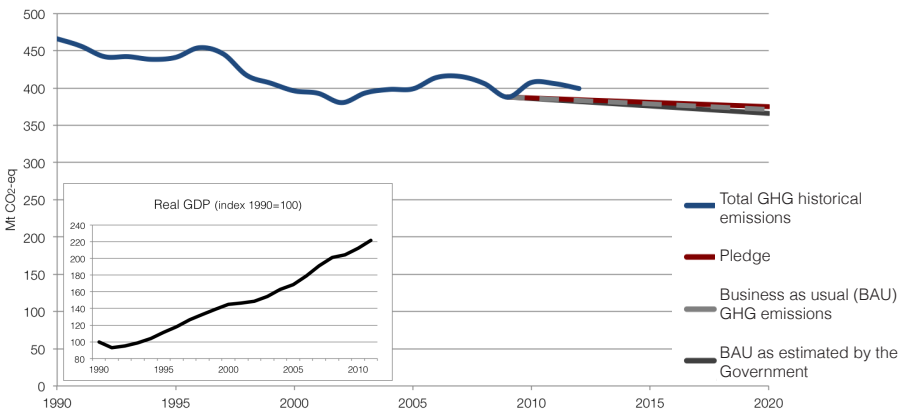
* among the 22 largest emitters

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Poland´s GHG emission reduction in 2020 w.r.t. 2005 is - 6%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Poland participates in the legally binding EU commitment (ratification pending).
The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990
(conditional pledge: -30%).

In an EU-wide effort sharing decision, Poland has committed itself to a reduction of +14% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 44% of total emissions in Poland. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, Poland takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

Poland aims at reaching the EU-15 level in energy intensity by 2030 and to keep primary energy demand constant after this. It intends to introduce nuclear energy and to promote renewable energy including biofuels. An action plan has been adopted.

In 2011, Poland introduced a scheme with tradable white certificates. Utilities have energy efficiency obligations. White certificates originate from tendered energy efficiency projects and can be used to avoid a fee. Another existing program targets energy efficiency in industry.

Subsidies for renewable energy were supposed to take effect as of January 1, 2013, but as of spring 2014 are still in the status of a draft law.

09 Sept. 2014

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° Generally 2011 data.
For details, see: "Sources for country fact sheet information"

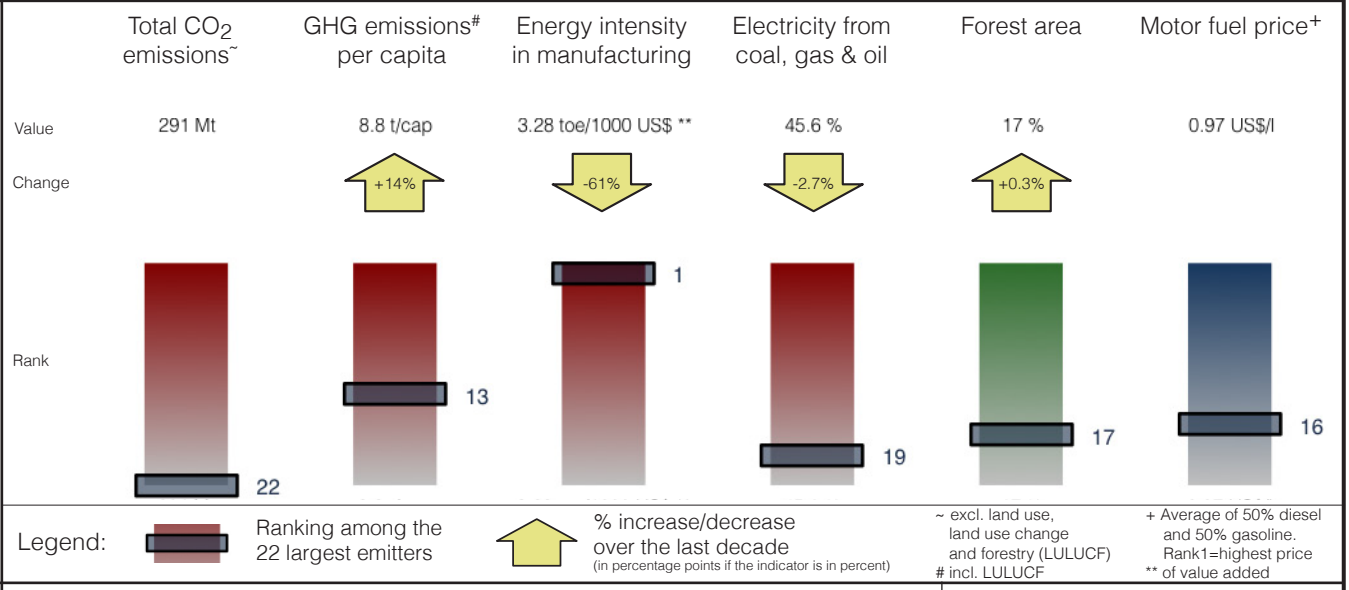
Econability
Sustainable Economics in Research and Practice

UKRAINE

	Value°	Rank *
Population:	46 mio	18
Annual population growth:	- 0.4 %	22
GDP per capita:	3'615 US$/capita	20
Fossil fuel resources:	553 tC/capita	6

* among the 22 largest emitters

INDICATORS°

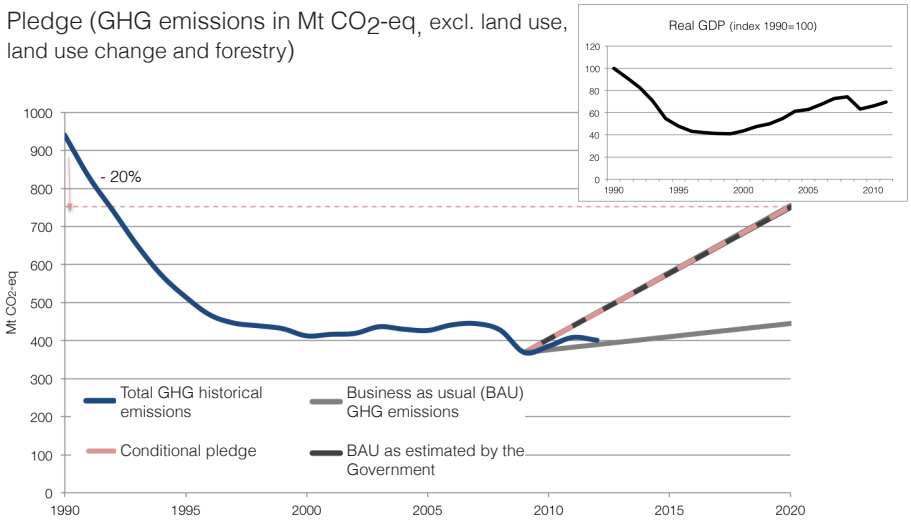


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections taken from Ecofys et al. 2012. The current recession is not taken into account in the BAU. BAU as estimated by the Government, the upper bound of the BAU from Ecofys et al., 2012 and the pledge are all roughly at the same level and are, thus, not fully visible.

Pledge (legally binding, ratification pending):

20% emission reduction by 2020 compared with 1990 levels.
Conditions:
- Developed countries have an agreed position on the quantified emission reduction targets of Annex I Parties;
- Ukraine maintains its status as a country with an economy in transition and the relevant preferences arising for such status;
- Flexibility mechanisms under the Kyoto Protocol are kept;
- 1990 is kept as the single base year.

DOMESTIC POLICIES

Ukraine targets to decrease energy intensity by 50% between 2005 and 2030. Several energy efficiency programs have been implemented with foreign financing, e.g. for banks, institutions in education, and public buildings in Kiev. In 2008, the Government established feed-in tariffs for renewable electricity.

In 2011, the UNFCCC suspended Ukraine from carbon trading because of failure to meet the reporting requirements.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

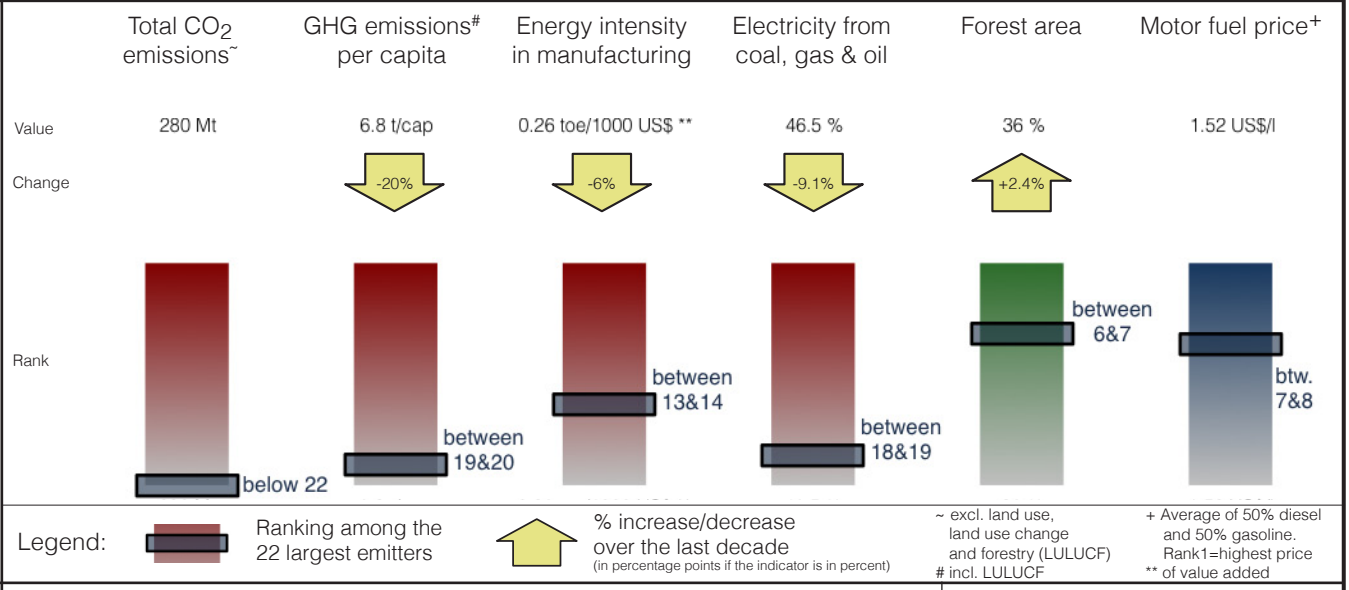
Econability
Sustainable Economics in Research and Practice

SPAIN

	Value°	Rank *
Population:	46 mio	between 17&18
Annual population growth:	0.4 %	between 16&17
GDP per capita:	31'943 US$/capita	between 9&10
Fossil fuel resources:	9 tC/capita	between 18&19

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

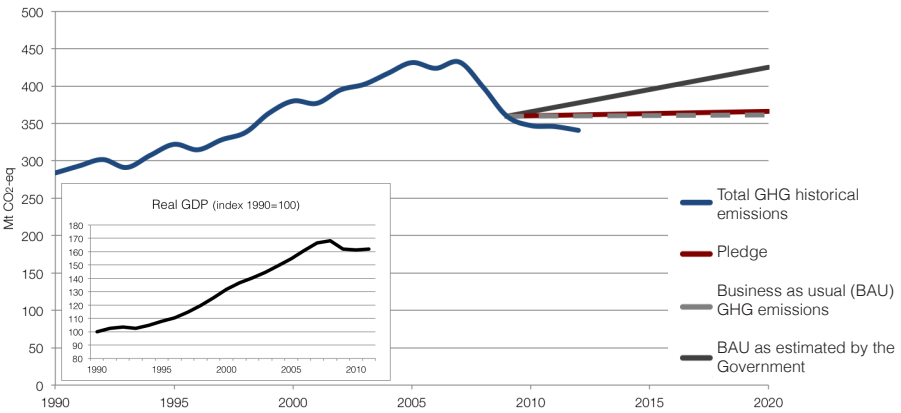


~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF

+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. The current recession is not taken into account in the BAU. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Spain´s GHG emission reduction in 2020 w.r.t. 2005 is -15%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Spain participates in the legally binding EU commitment (ratification pending).
The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990
(conditional pledge: -30%).

In an EU-wide effort sharing decision, Spain has committed itself to a reduction of -10% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 53% of total emissions in Spain. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, Spain takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

The National Climate Strategy covers the period until 2020. Policies and measures concentrate mainly on the energy sector. A feed-in tariff scheme for renewable electricity is in place which, since 2009, includes a cap for wind and solar technologies. Electricity from renewable sources already covers more than one third of total electricity demand. Feed-in tariffs also exist for combined heat and power generation. There are obligations to use solar energy in new and retrofitted buildings. In transport, there are partial tax exemptions for biofuels.

09 Sept. 2014

Support has been provided by the Swiss Federal Office for the Environment FOEN.

This fact sheet has not been approved by the respective Government.

° Generally 2011 data.
For details, see: "Sources for country fact sheet information"

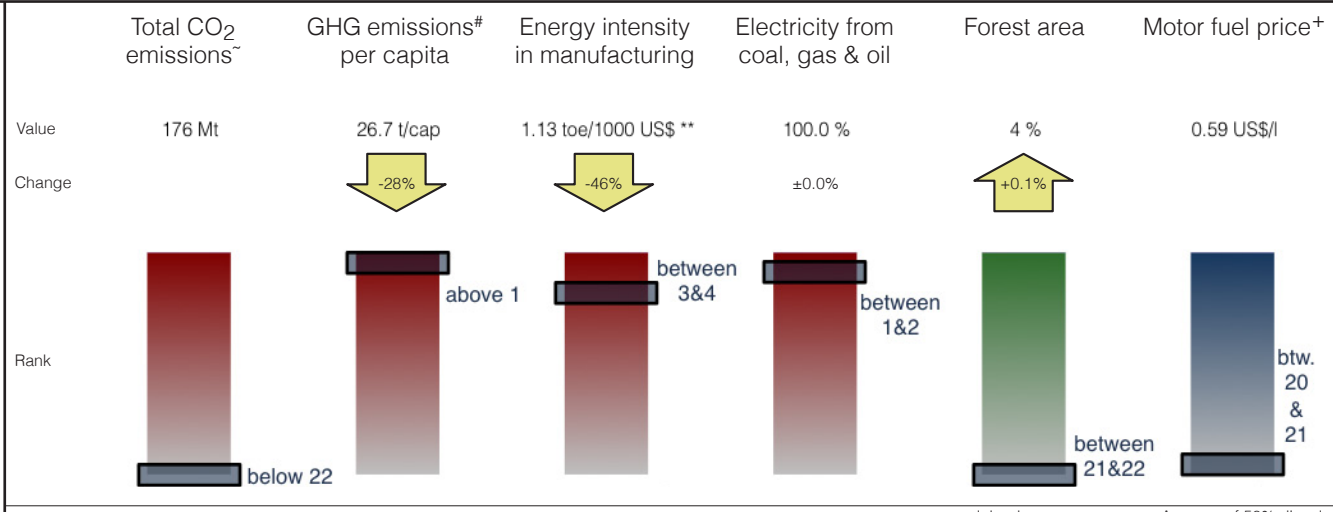
Econability
Sustainable Economics in Research and Practice

UNITED ARAB EMIRATES

	Value°	Rank *
Population:	8 mio	below 22
Annual Population growth:	4.9 %	above 1
GDP per capita:	45'653 US$/capita	between 4&5
Fossil fuel resources:	1974 tC/capita	between 1&2

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

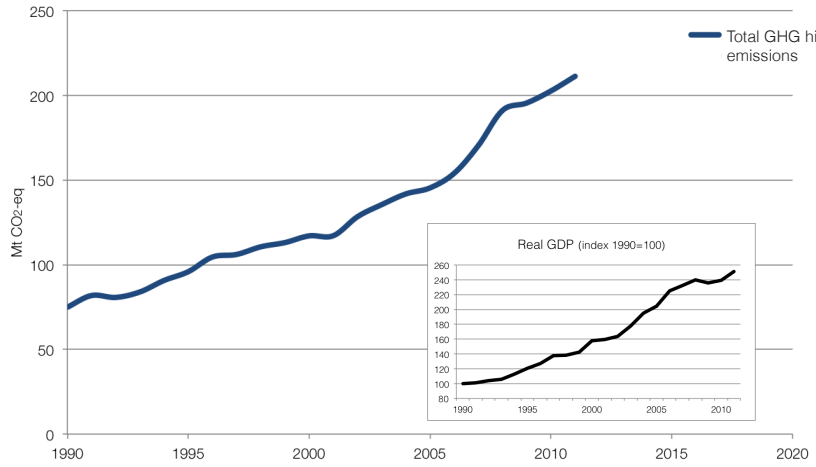


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: No BAU was put forward in the United Arab Emirates' second National Communication to the UNFCCC. We did not find BAU scenarios from other sources.

Pledge:

No pledge.

DOMESTIC POLICIES

In 2014, two nuclear power reactors are under construction and two more are planned for the near future. All four 1400 MW power plants are expected to operate in 2020.

The Masdar City Initiative plans to build the largest carbon-neutral city in the world.

A revision of the energy subsidy scheme, which covers almost 85% of the energy bills of Emiratis (50% for foreigners), is currently under discussion.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

Econability
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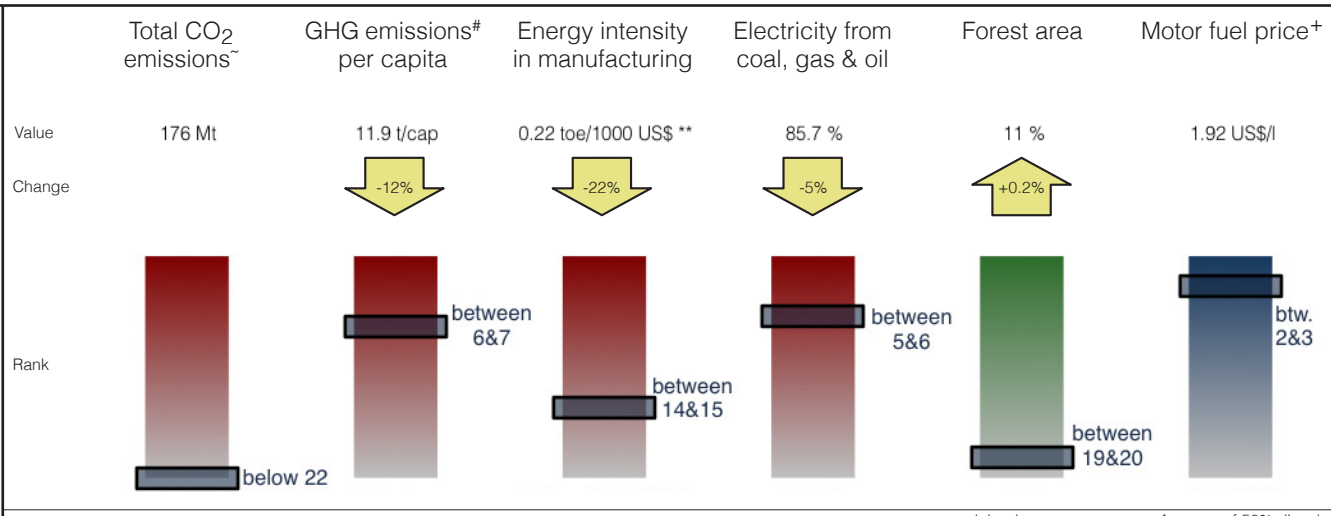
NETHERLANDS

	Value°	Rank *
Population:	17 mio	below 22
Annual Population growth:	0.5 %	between 14&15
GDP per capita:	50'076 US$/capita	between 2&3
Fossil fuel resources:	50 tC/capita	between 12&13

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

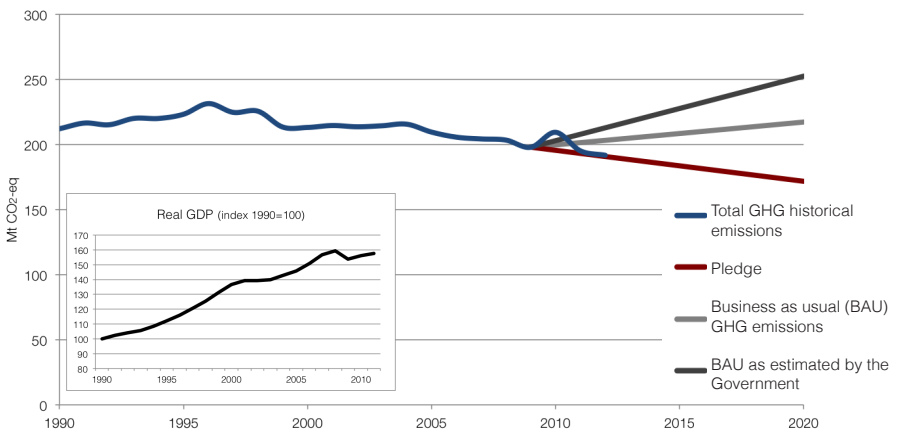


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), the Netherland´s GHG emission reduction in 2020 w.r.t. 2005 is -18%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

The Netherlands participate in the legally binding EU commitment (ratification pending). The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990 (conditional pledge: -30%).

In an EU-wide effort sharing decision, the Netherlands have committed themselves to a reduction of -16% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 59% of total emissions in the Netherlands. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, the Netherlands take part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

Support for electricity generation from renewable sources is granted by a fixed premium on top of the wholesale price. The level and the duration of the premium varies with different technologies. Voluntary commitments to improvements in energy efficiency, often with penalties for non-compliance, are encouraged by the Government in all sectors. In transport, the vehicle sales tax depends upon fulfilment of emissions standards of the vehicles. A road pricing system which allows for discrimination of emissions is currently under discussion.

The Netherlands announced a national target of 14% renewables in total energy consumption by 2020 and 16% by 2023 (2010: 4%) and pursue the goal to achieve energy savings of 2% each year until 2020. The shutdown of five coal fired power plants until 2017 has been decided.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

Econability
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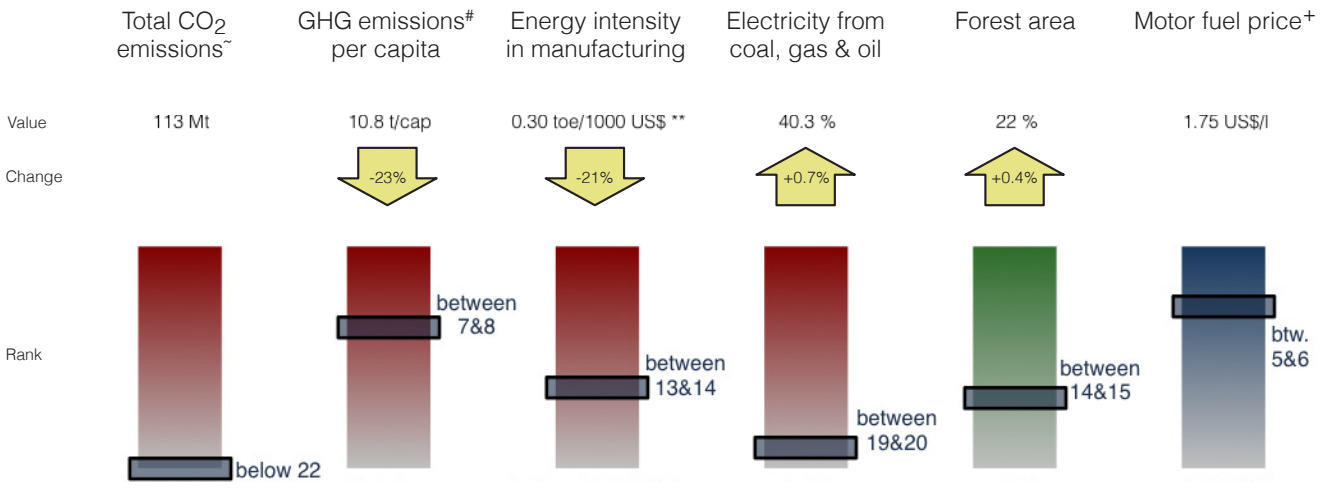
BELGIUM

	Value°	Rank *
Population:	11 mio	below 22
Annual Population growth:	1.0 %	between 8&9
GDP per capita:	46'663 US$/capita	between 3&4
Fossil fuel resources:	0 tC/capita	below 22

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

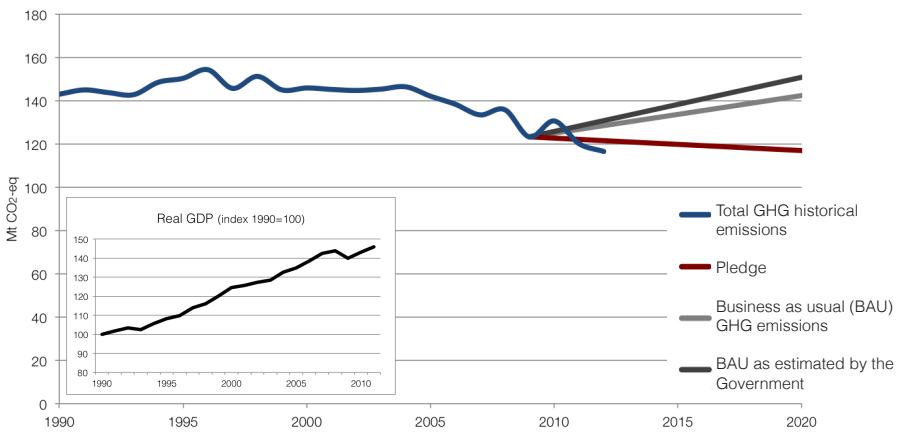


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Belgium´s GHG emission reduction in 2020 w.r.t. 2005 is -18%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Belgium participates in the legally binding EU commitment (ratification pending). The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990 (conditional pledge: -30%).

In an EU-wide effort sharing decision, Belgium has committed itself to a reduction of -15% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 55% of total emissions in Belgium. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, Belgium takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

In Belgium, climate policy is predominantly a task of the three regions Flanders, Wallonia, and Brussels, not of the federation. Regional measures include e.g. tax deductions for energy saving expenditures and the implementation of EU Directives on building standards. A settlement between the regions on the distribution of non EU-ETS mitigation obligations for 2013-2020 has not been reached yet. So far, Wallonia is the only region to have a GHG emissions target for 2020 (-30% relative to 1990 levels), but does not distinguish between ETS sectors and non-ETS sectors.

Green certificates for renewable energy and combined heat and power have been established, but not coordinated among regions and the federal state. On the federal level, a nuclear phase out from 2015 to 2025 has been decided.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

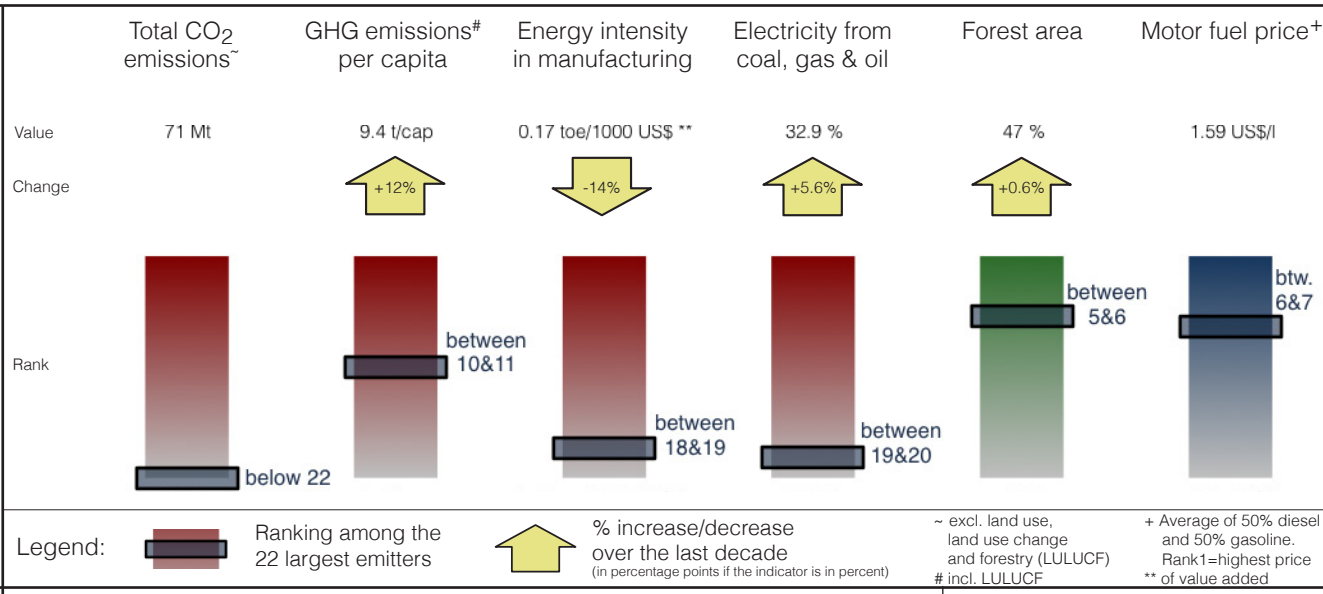
Econability Sustainable Economics in Research and Practice

AUSTRIA

	Value°	Rank *
Population:	8 mio	below 22
Annual Population growth:	0.3 %	between 16&17
GDP per capita:	49'609 US$/capita	between 2&3
Fossil fuel resources:	2 tC/capita	between 20&21

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

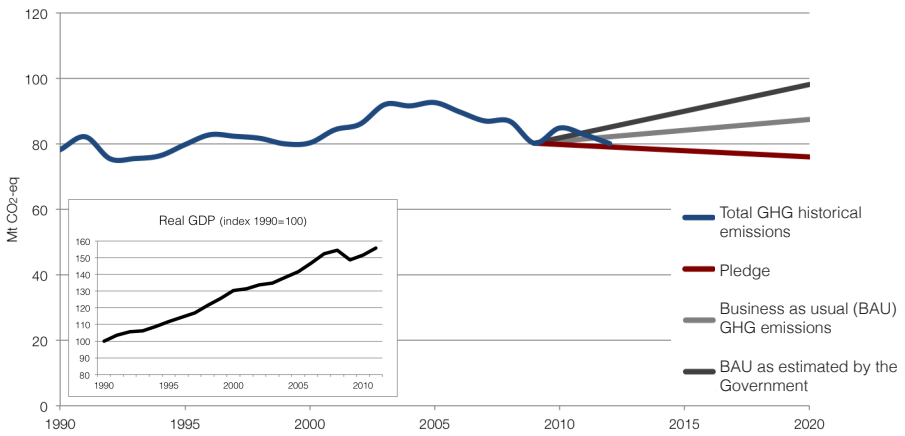


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Austria´s GHG emission reduction in 2020 w.r.t. 2005 is -18%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Austria participates in the legally binding EU commitment (ratification pending). The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990 (conditional pledge: -30%).

In an EU-wide effort sharing decision, Austria has committed itself to a reduction of -16% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 61% of total emissions in Austria. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

As an EU Member State, Austria takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

The Austrian Climate Change Strategy was established in 1999/2000 to secure the achievement of the Kyoto targets and was revised in 2005-2007. The Climate Protection Law of 2010 sets emissions ceilings for 2020 for six sectors, including energy and industry outside the ETS, agriculture, housing, transport, waste and fluorinated gases. Since 2004, the Klimaaktiv initiative promotes the introduction of energy saving technologies in various sectors (e.g. housing and transport). In the housing sector, strong construction and renovation standards for public buildings add to the subsidy schemes.

The National Renewable Action Plan of 2010 issued a target of 34% renewables in gross final energy consumption in 2020. This overall target is complemented by objectives in heating and cooling, transport, and electricity generation (e.g. 71% of electricity from renewables in 2020). A feed-in tariff scheme to promote renewables was established by the Green Electricity Act in 2003 (latest revision in 2012). The feed-in tariffs are subject to alignment on a yearly basis. For 2014, they were significantly reduced.

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

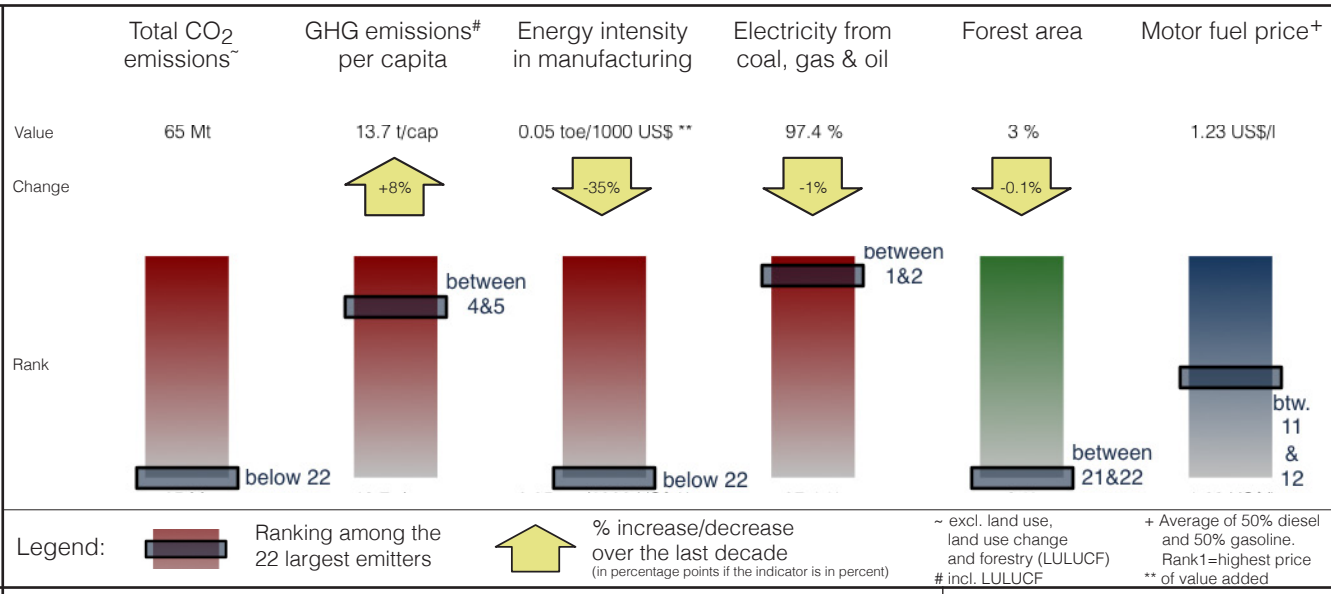
Econability Sustainable Economics in Research and Practice

SINGAPORE

	Value°	Rank *
Population:	5 mio	below 22
Annual Population growth:	2.1 %	between 1&2
GDP per capita:	46'241 US$/capita	between 3&4
Fossil fuel resources:	0 tC/capita	below 22

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

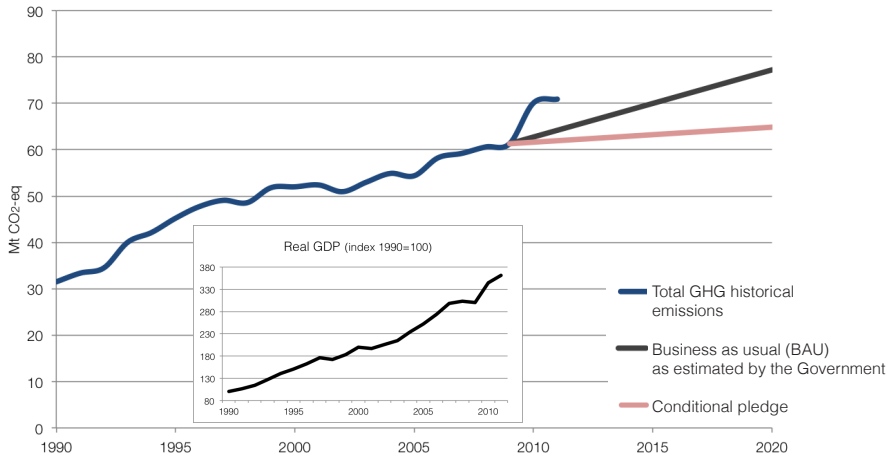


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
\+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: The Singapore Government put forward a BAU in its National Climate Change Strategy 2012, thus published after its National Communication to the UNFCCC. This BAU excludes measures taken after 2005.

Pledge (non-legally binding):

Nationally appropriate mitigation actions leading to a reduction of GHG emissions by 16% below Business as Usual levels in 2020, contingent on a legally binding global agreement in which all countries implement their commitments in good faith.

DOMESTIC POLICIES

According to its National Climate Change Strategy 2012, Singapore "has embarked on policies and measures that will reduce our emissions by 7% to 11% below 2020 BAU levels". The 2009 Sustainable Singapore Blueprint sets a national target for improving energy efficiency by 20% from 2005 levels by 2020 (and by 35% in 2030).

Singapore switched its dominant fuel for electricity generation from coal to natural gas. Consequently, the share of natural gas in electricity generation raised from 19% in 2000 to 80% today. Renewables are promoted through support for research and development. The 2013 Energy Conservation Act obliges large industrial energy consumers to establish energy efficiency plans. In the building sector, efficiency standards are in force.

The size of the vehicle fleet is regulated by quota since 1990. Today, the annual growth rate of the quota is 0.5%. Vehicle registration fees are extremely high, but since 2013 owners of new and imported used cars with CO_2 emissions of no more than 160 g/km receive rebates of SGD 5 000 to 20 000 (Singapore dollars), which approximately corresponds to EUR 3100 to 12 300; moreover, for cars emitting more than 210 gCO_2/km, a surcharge of equal amount must be paid.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

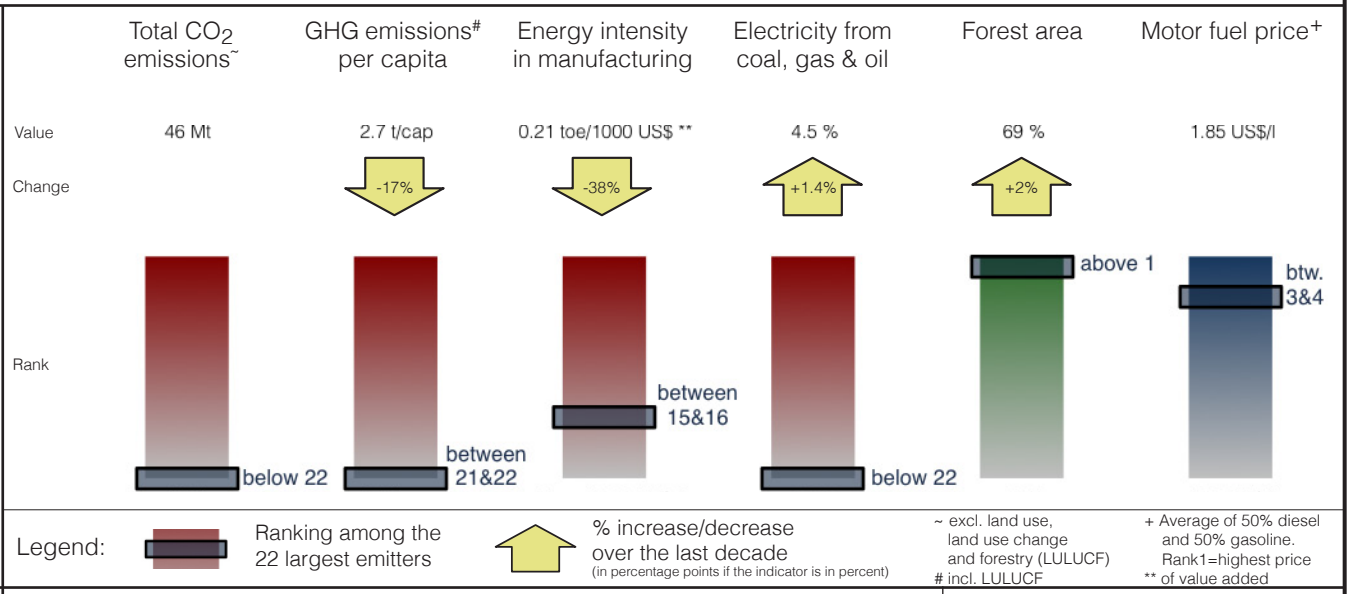
Econability
Sustainable Economics in Research and Practice

SWEDEN

	Value°	Rank *
Population:	9 mio	below 22
Annual Population growth:	0.8 %	between 10&11
GDP per capita:	57'091 US$/capita	between 1&2
Fossil fuel resources:	0 tC/capita	below 22

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

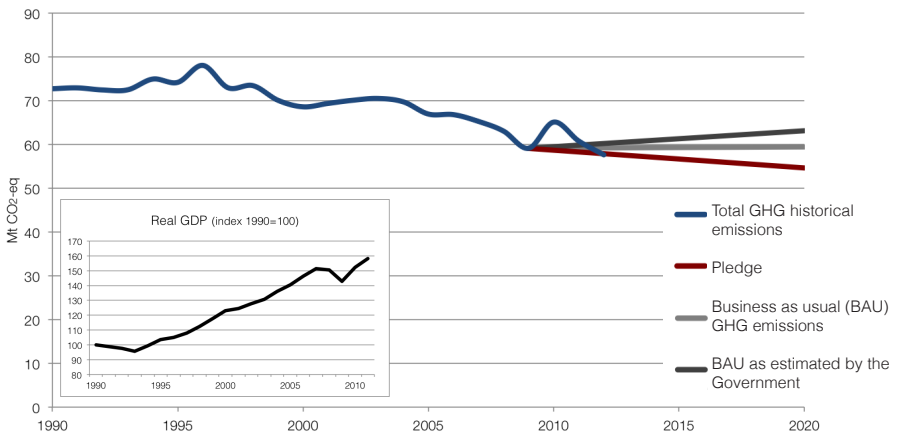


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Sweden´s GHG emission reduction in 2020 w.r.t. 2005 is -18%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Sweden participates in the legally binding EU commitment (ratification pending). The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990 (conditional pledge: -30%).

In an EU-wide effort sharing decision, Sweden has committed itself to a reduction of -17% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 65% of total emissions in Sweden. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

Sweden pursues a national GHG reduction goal of -40% in 2020 relative to 1990.

As an EU Member State, Sweden takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

A tax on carbon was introduced in 1991 and is currently fixed at around SEK 1050 (EUR 115) per ton of CO_2. Due to numerous exemptions, it is primarily paid by private households. Electricity consumption in the industrial sector is taxed since 2004. Companies can receive tax rebates for enacting certified energy saving programs.

Electricity supply is almost carbon free, because of hydro and nuclear power. Renewable energy sources are promoted by a green certificate system in order to reduce carbon intensity further. In 2012, Sweden and Norway enabled cross border trading of the certificates. In the transport sector, CO_2 emissions are tackled via exemptions from energy and fuel taxation for biofuels and a vehicle tax that is based on CO_2 emissions. Sweden aims at phasing out fossil fuels in heating by 2020 and in transport by 2030.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

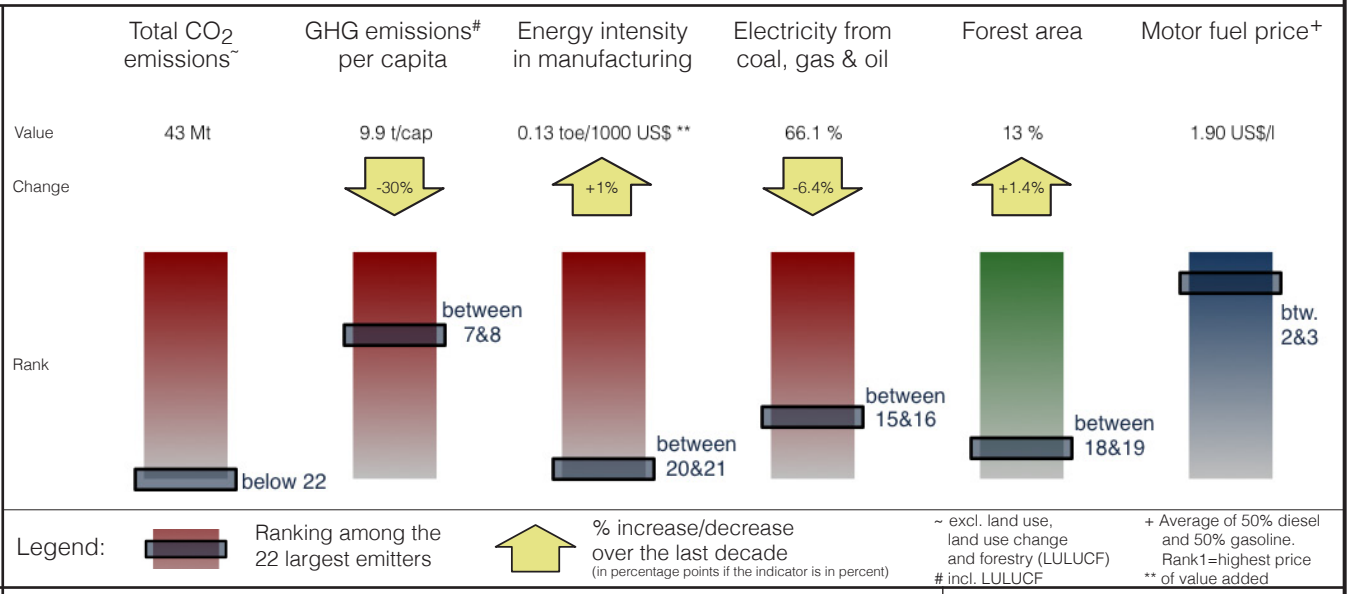
Econability Sustainable Economics in Research and Practice

DENMARK

	Value°	Rank *
Population:	6 mio	below 22
Annual Population growth:	0.5 %	between 14&15
GDP per capita:	59'852 US$/capita	between 1&2
Fossil fuel resources:	25 tC/capita	between 15&16

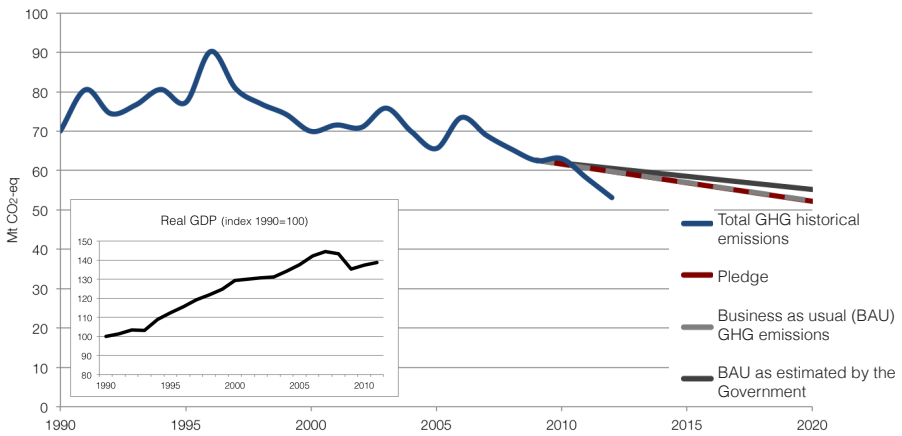
* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU projections (Gov., and EEA 2012) include existing measures. Assuming equal percentage reductions in all EU Member States for emissions included in the EU emissions trading system (EU ETS), Denmark´s GHG emission reduction in 2020 w.r.t. 2005 is -20%. As in an emissions trading system some countries may reduce more than others, the actual domestic emission reduction may deviate from the pledge as represented in the graph.

Pledge:

Denmark participates in the legally binding EU commitment (ratification pending). The EU as a whole pledges a 20% GHG emission reduction in 2020 w.r.t. 1990 (conditional pledge: -30%).

In an EU-wide effort sharing decision, Denmark has committed itself to a reduction of -20% w.r.t. 2005 by 2020 (EU average: -10%). This commitment concerns only emissions that are not included in the EU emissions trading system (EU ETS) or approximately 57% of total emissions in Denmark. In the EU ETS, the EU-wide emission reduction w.r.t. 2005 is 21%.

DOMESTIC POLICIES

The Danish Climate Policy Plan of 2013 proposes a national GHG emissions target of -40% in 2020 relative to 1990 levels. In 2014, the Government decided to establish a procedure for setting national GHG reduction targets and an independent Climate Council which shall assess climate policy and compliance with climate goals on an annual basis. These provisions are expected to be implemented in early 2015.

As an EU Member State, Denmark takes part in the EU Emissions Trading System (EU-ETS). The ETS entered its 3rd phase in 2013, which introduced a single, EU-wide cap on emissions by ETS installations. The cap is tightened by 1.74% per year until 2020. Increasingly, the system relies on auctioning as an allocation method, with more than 40% of allowances auctioned already in 2013.

A carbon tax was introduced in 1992 in addition to existing energy taxes on coal, oil, natural gas, and electricity. In 2008, the tax was set at EUR 20 per ton CO_2 and is raised by 1.8% annually. The revenue is partly redistributed to households and industry by subsidies for improvements in energy efficiency.

Electricity generation from renewable sources is promoted by feed-in premiums and exemptions from energy and carbon taxes. Since 1979, electric heating in buildings is prohibited, if access to district heating or natural gas is available. Today, more than 75% of all households are connected to district heating. Denmark aspires to reach 100% renewables in energy consumption by 2050.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

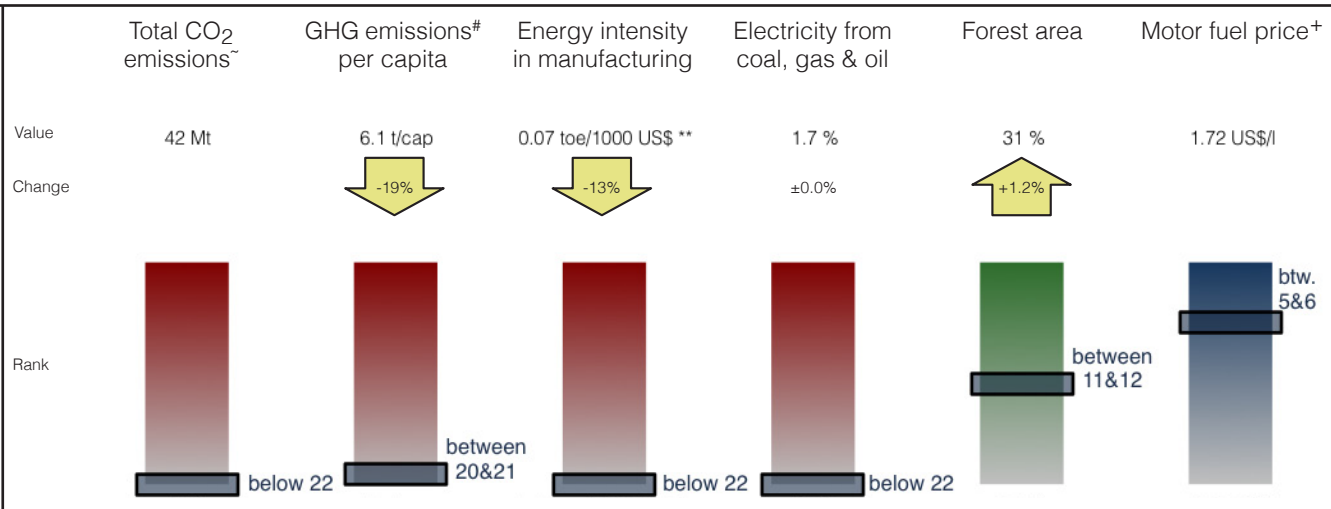
Econability
Sustainable Economics in Research and Practice

SWITZERLAND

	Value°	Rank *
Population:	8 mio	below 22
Annual Population growth:	1.0 %	between 8&9
GDP per capita:	83'383 US$/capita	above 1
Fossil fuel resources:	0 tC/capita	below 22

* ranked against the 22 largest emitters (Switzerland is not one of them)

INDICATORS°

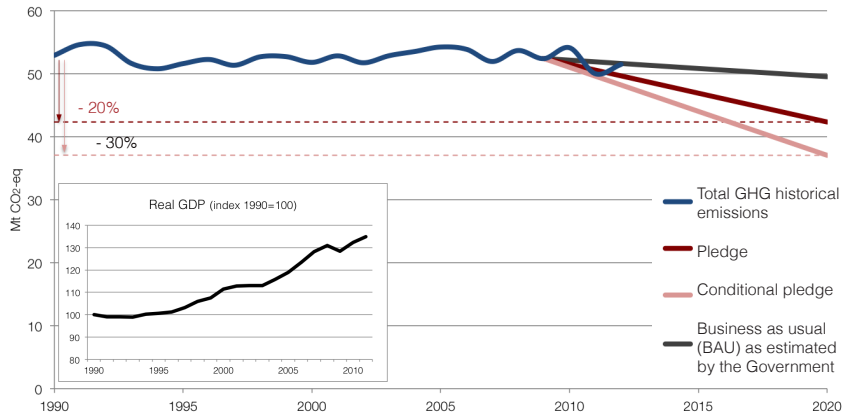


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: BAU as included in the national communication to the UNFCCC includes existing measures.

Pledge (legally binding, ratification pending):

20% emission reduction by 2020 compared with 1990 levels.

Conditional pledge (non-legally binding):

Switzerland would consider a higher reduction target up to 30% by 2020 compared to 1990 levels subject to comparable emission reduction commitments from other developed countries and adequate contribution from developing countries according to their responsibilities and capabilities in line with the 2° C target.

DOMESTIC POLICIES

On 23 December 2011, the Swiss Parliament approved a revised CO_2 Act, which constitutes the legal framework for Switzerland's climate policy from 2013 to 2020. On 30 November 2012, the Federal Council approved the new CO_2 Ordinance, which entered into force along with the revised CO_2 Act on 1 January 2013. The revised CO_2 Act takes over from the previous CO_2 Act in force since 2000.
The CO_2 Act stipulates that by 2020, domestic GHG emissions must be reduced by 20% compared to 1990 levels.
The main instruments and measures are:
- CO_2 levy on thermal fuels, with an exemption being offered to companies that make specific CO_2 reduction commitments;
- Emissions trading scheme (ETS) for energy intensive companies, designed with a view to linking up with the EU ETS;
- Buildings programme to channel a third of the revenues from the CO_2 levy, with a maximum of 300 million Swiss francs per year;
- Obligation for fossil motor fuel importers to partially compensate for related emissions;
- Binding CO_2 emission target value of an average of 130 gCO_2/km by 2015 on new cars;
- Obligation for operators of fossil fuel thermal power plants to compensate in full for the CO_2 emissions, with a minimum of 50% to be offset domestically.

The CO_2 Act allows the Federal Council to increase the reduction target to 40% at most in accordance with international agreements. A maximum of 75% of the additional reductions in GHG emissions may be achieved through measures carried out abroad.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

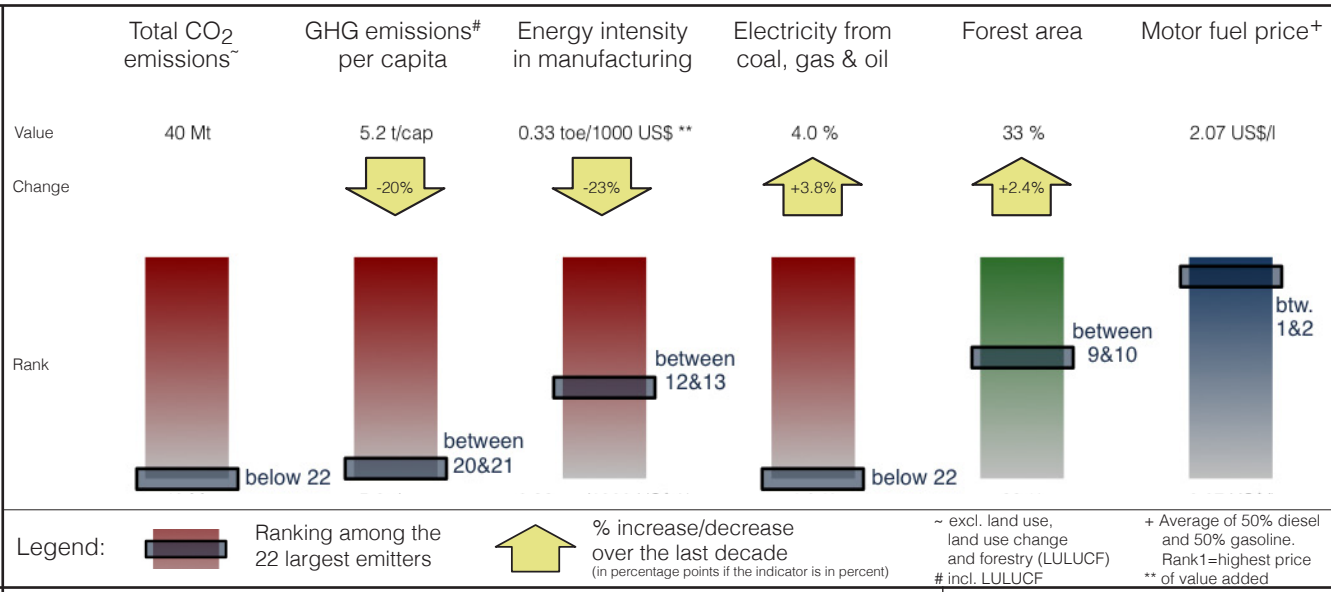
Econability Sustainable Economics in Research and Practice

NORWAY

	Value°	Rank *
Population:	5 mio	below 22
Annual Population growth:	1.3 %	between 3&4
GDP per capita:	98'102 US$/capita	above 1
Fossil fuel resources:	381 tC/capita	between 8&9

* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°

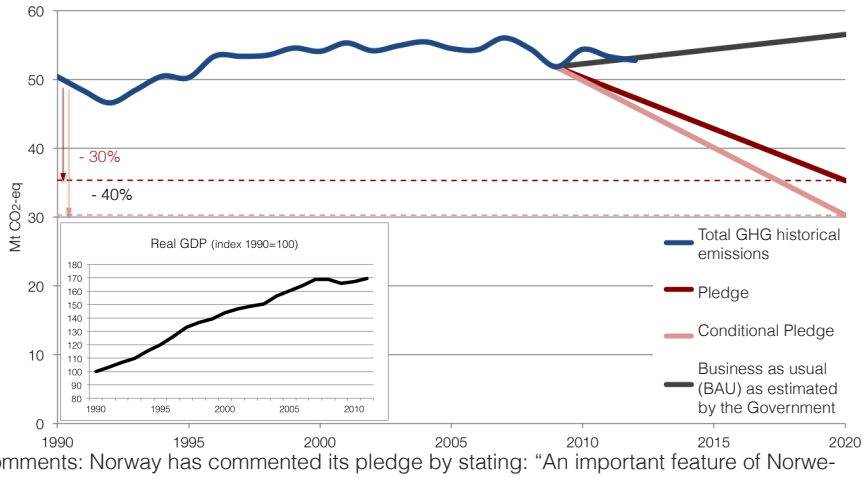


Legend: Ranking among the 22 largest emitters; % increase/decrease over the last decade (in percentage points if the indicator is in percent)

~ excl. land use, land use change and forestry (LULUCF)
# incl. LULUCF
+ Average of 50% diesel and 50% gasoline. Rank1=highest price
** of value added

INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: Norway has commented its pledge by stating: "An important feature of Norwegian climate change policy is the flexible and cost-effective Kyoto Protocol based approach". The LULUCF sector is a sizeable sink, which approximately halves Norway's total emissions. Depending on LULUCF accounting, the actual ambition of the pledge may vary.

Pledge (legally binding):

30% emission reduction by 2020 compared with 1990 levels.

Moving to 40% reduction as part of a global and comprehensive agreement for the period beyond 2012 where major emitting Parties agree on emissions reductions in line with the 2 degrees Celsius target.

DOMESTIC POLICIES

Norway pursues to become a 100% carbon neutral economy in 2030. The objective is conditional on an ambitious international agreement.

In 2005, Norway started an Emissions Trading System, which is designed similarly to the EU-ETS. Since 2008, both are linked, and full harmonization was put into force in 2013. In its second phase (2008-2012), the Norwegian ETS covered about 40% of the country's projected GHG emissions. Free allocations of allowances were reduced to 39% of total allocations.

A green certificate system promotes renewable electricity generation, which is already very high in Norway due to well developed hydropower. In 2012, Norway and Sweden established a common market for green certificates.

A carbon tax is raised since 1991. Petroleum activities on the continental shelf are covered by the tax, too. A carbon capture and storage (CCS) project, which had been designed to capture 1 million tons of CO_2 per year, was cancelled in 2013 because of high costs.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

Econability
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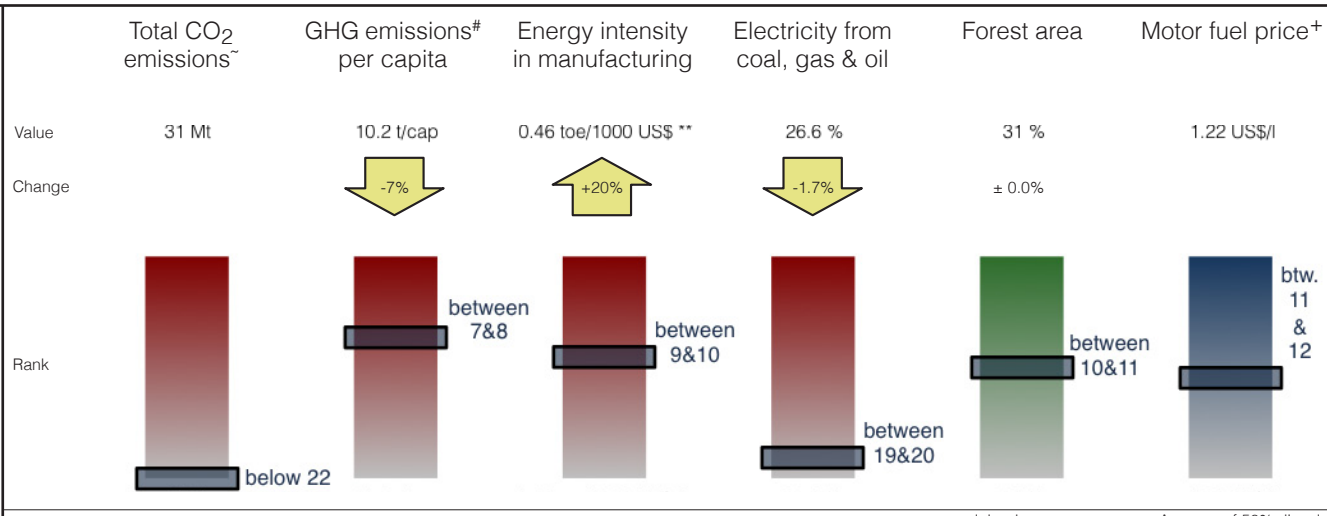
NEW ZEALAND

	Value°	Rank *
Population:	4 mio	below 22
Annual Population growth:	0.9 %	between 10&11
GDP per capita:	36'254 US$/capita	between 7&8
Fossil fuel resources:	101 tC/capita	between 10&11

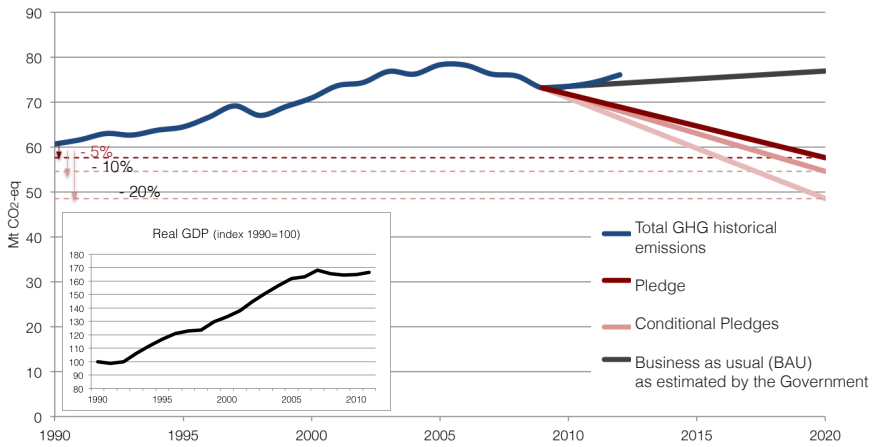
* ranked against the 22 largest emitters (this country is not one of them)

INDICATORS°



INTERNATIONAL PLEDGE

Pledge (GHG emissions in Mt CO_2-eq, excl. land use, land use change and forestry)



Comments: For New Zealand, the fact that the land use, land use change and forestry (LULUCF) sector is a large sink and uncertainties around LULUCF accounting methods imply that the pledge could be less stringent than it appears here.

Pledge (non-legally binding):

Emissions reductions of 5% below 1990 levels by 2020 unconditionally, and of 10 - 20% if there is a comprehensive global agreement. This means:
- The global agreement sets the world on a pathway to limit temperature rise to not more than 2°C;
- Developed countries make comparable efforts to those of NZ;
- Advanced and major emitting developing countries take action fully commensurate with their respective capabilities;
- Effective set of rules for land use, land-use change and forestry (LULUCF); and
- Full recourse to a broad and efficient international carbon market.

DOMESTIC POLICIES

New Zealand proclaimed a national target for 2050 of a 50% reduction in GHG emissions relative to 1990 and pursues to generate 90% of its electricity generation from renewable sources in 2025 (2011: 76.8%).

In 2008, an Emissions Trading Scheme (ETS) was started. Today, it covers the sectors of forestry, transport fuels, stationary energy, industrial processes, synthetic gases, agriculture and waste. While the original aim to include virtually all of the country's GHG emissions in the system has been abandoned, coverage is exceptionally high. Carbon credits can be obtained from forest sinks, and they can be imported without limit from Kyoto markets (ERUs, CERs, RMUs) and potentially other markets that will be linked in the future. Under the prevailing low prices, importing international carbon offsets has become the most common method of compliance for entities regulated under New Zealand's ETS. Free allocations of emission units have been made to eligible businesses with exposure to foreign trade. Since 2013, however, electricity generation, liquid fossil fuels, waste or synthetic gases businesses are not eligible anymore.

Promotion of renewable energy is mostly confined to regulatory measures and support for research. Energy efficiency is tackled via common labelling and energy standards for consumer products with Australia. An insulation program for residential homes ended in 2013 after paying shares of retrofitting costs for about 230 000 homes.

09 Sept. 2014

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° Generally 2011 data. For details, see: "Sources for country fact sheet information"

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SOURCES FOR COUNTRY FACT SHEET INFORMATION

INDICATORS

Population (in millions): World Development Indicators (http://data.worldbank.org/indicator/all, retrieved Feb. 2013), data for 2011.

Annual population growth (in %): World Development Indicators, data for 2011.

GDP per capita (in US$ per capita): World Development Indicators, data for 2011.

Fossil fuel resources (in tons of carbon per capita): Calculated from: "Proven crude oil reserves in 2012", "Proven natural gas reserves in 2012" and "Recoverable coal in 2008" from the US International Energy Statistics (EIA), Population from World Development Indicators, and conversion factors from the Swiss "Gesamtenergiestatistik" and IPCC.

Total CO_2 emissions (in Mt, excl. land use, land use change and forestry (LULUCF)): CAIT (http://cait2.wri.org, retrieved July 2014), data for 2011. For Switzerland, 2011 data comes from: Swiss Greenhouse Gas Inventory, Submission April 2014.

GHG emissions per capita (in tons per capita, incl. LULUCF): GHG emissions from UNFCCC and CAIT (when UNFCCC data is unavailable) divided by population from World Development Indicators, data for 2011. CAIT methodology states: "*LULUCF data are useful as reference only and may not coincide with LUCF emissions reported by countries to the UNFCCC [...] More generally, users should note that the errors and uncertainties associated with these (and other LUCF) estimates may be significant.*". Change in % over the last decade concerns the period 2001 to 2011 with identical sources used for 2001 and 2011 data in each country.

Energy intensity in manufacturing (in toe per 1000 US$ of value added): UNIDO, data for 2008. Aggregation for the European Union was not available. Thus, the EU-27 energy intensity of manufacturing was calculated using the final energy use for industry by Eurostat and value added in manufacturing from the World Development Indicators. Change in % over the last decade: Data for 1998 was calculated as a linear regression between data for 2000 and 1990. This might incur inaccuracies especially for Poland and Ukraine.

Electricity from coal, gas & oil (in % of total electricity generation): World Development Indicators, data for 2010. Change in percentage points taken between data for 2010 and 2000.

Forest area (in % of land area): World Development Indicators, data for 2010. Change in percentage points taken as difference between data for 2010 and 2000.

Motor fuel price at the pump (in US$/l): World Development Indicators, data for 2010. Average of 50% diesel and 50% gasoline.

INTERNATIONAL PLEDGE

Historical data: For Annex I countries, historical GHG emissions (excl. LULUCF) from UNFCCC (http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3841.php). For non-Annex I countries, GHG emissions (excl. LULUCF) from CAIT (data retrieved from website http://cait2.wri.org on 28 July 2014). Data exclude Land Use, Land Use Change and Forestry (LULUCF), because of severe uncertainties for many countries, particularly developing countries. Countries for which inclusion of LULUCF data would draw a distinctively different picture (e.g. concerning emissions trajectory or emissions totals) are Brazil, Indonesia and, to a lesser extent, Mexico, Australia, Canada and Russia.

Business as usual (BAU) emissions:

- International Energy Agency (IEA). "World Energy Outlook 2012".
- US Energy Information Administration (EIA). "International Energy Outlook 2011".
- European Environment Agency (EEA). "Greenhouse gas emission trends and projections in Europe 2012; Tracking progress towards Kyoto and 2020 targets" (EU-27).
- Peterson Institute for International Economics (PIIE), Cline, W.R., 2007. "Baseline Emissions under Business as Usual. In Carbon Abatement Costs and Climate Change Finance. Policy Analyses in International Economics", pp. 7–18.
- Ecofys et al., 2012. "Greenhouse gas emission reduction proposals and national climate policies of major economies".

For the few BAU projections that are set in a different accounting, absolute emissions were scaled to match the latest historical data point, keeping the growth rate until 2020 constant. For improved readability, 2020 BAU projections are connected with the historical data point for 2009 by a straight line, irrespective of the BAU's year of publication. Consequently, BAU lines do not follow the actual BAU trajectories, but illustrate the BAU emission values for 2020.

Business as usual emissions as estimated by the Government: National Communications to the UNFCCC. For improved readability, the 2020 BAU projection is connected with the historical data point for 2009 by a straight line, irrespective of the BAU's year of publication. Consequently, the BAU line does not follow the actual BAU trajectory, but illustrates the BAU emission value for 2020.

Pledges (formulation): UNFCCC (FCCC/SB/2011/INF.1/Rev.1, FCCC/AWGLCA/2011/INF.1 and FCCC/KP/CMP/2012/13/Add.1)
Pledges (absolute GHG emissions for the graphs): Where necessary, because pledges are formulated relative to BAU or in efficiency terms, own calculations and estimates from Ecofys et al. 2012 and National Communications to the UNFCCC. For the EU-27 countries, to reflect the share of each country in ETS emission (reductions), adjusted 2020 ESD target emissions were taken from the European Environment Agency´s (EEA) "Greenhouse gas emission trends and projections in Europe 2012; Tracking progress towards Kyoto and 2020 targets". 2020 targets are connected with the historical data point for 2009 by a straight line.

GDP: World Development Indicators (GDP in real terms, i.e. constant US$), index normalized to 100 in 1990.

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ÜBERSETZUNGEN/GLOSSAR
TRADUCTIONS/GLOSSAIRE

ENGLISH	DEUTSCH	FRANCAIS
business as usual (BAU) emissions	erwartete Emissionen ohne (zusätzliche) klimapolitische Massnahmen Unsicher aufgrund unsicherer Wachstumserwartungen. Häufig unklar, welche bestehenden Massnahmen einzubeziehen sind.	émissions estimées sans tenir en compte des politiques climatiques et mesures (additionnelles) Ces estimations sont incertaines à cause des hypothèses de croissance qui sont elles-mêmes incertaines. Il est parfois difficile de savoir quelles mesures devraient être prises en compte.
CO_2-eq	CO_2-Äquivalente Die verschiedenen Treibhausgase lassen sich addieren mittels ihrer Umrechnung in CO_2-Äquivalente. Die Umrechnung basiert auf dem relativen Treibhauspotenzial der verschiedenen Gase über einen Zeitraum von 100 Jahren, wobei CO_2 ein Treibhauspotenzial von 1 zugeordnet wird.	équivalent CO_2 Les différents gaz à effet de serre peuvent être additionnés à l'aide d'une équivalence CO_2. Le taux de conversion est basé sur le potentiel de réchauffement global d'un gaz à effet de serre sur une durée de 100 ans, le CO_2 ayant un potentiel de réchauffement global de 1.
GDP (gross domestic product)	BIP (Bruttoinlandsprodukt)	PIB (produit intérieur brut)
GHG (greenhouse gases)	THG (Treibhausgase)	GES (gaz à effet de serre)
land use, land use change & forestry (LULUCF)	Landnutzung, Landnutzungsänderung und Forstwesen Treibhausgasrelevanter Sektor, der im Kyoto-Protokoll (Art.3.3 & 3.4) definiert wird.	l'utilisation des terres, le changement d'affectation des terres et la foresterie Secteur relevant pour les gaz à effet de serre défini sous le Protocole de Kyoto (Art 3.3 & 3.4).
Mt (megatons)	Mt (Megatonnen)	Mt (mégatonnes)
per capita (/cap)	pro Kopf	par habitant
pledge	Verpflichtung	engagement
ppm (parts per million)	Teile pro Millionen	partie par million
REDD+ (reducing emissions from deforestation and forest degradation)	Reduktion von Emissionen aus Entwaldung und Schädigung von Wäldern Mechanismus, der Anreize zum Waldschutz und zu nachhaltiger Forstwirtschaft in Entwicklungsländern schafft.	réduction des émissions de gaz à effet de serre liées à la déforestation et la dégradation forestière Mécanisme d'incitation à la conservation et à la gestion durable des forêts dans les pays en voie de développement.
tC (tons of carbon)	tC (Tonnen Kohlenstoff)	tC (tonnes de carbone)
toe (tons of oil equivalents)	Tonne Öleinheit	tep (tonnes équivalent pétrole)
value added	Wertschöpfung	valeur ajoutée
w.r.t (with respect to)	bezogen auf	par rapport à

09 Sept. 2014

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