EU Energy Policy

Factsheets for media

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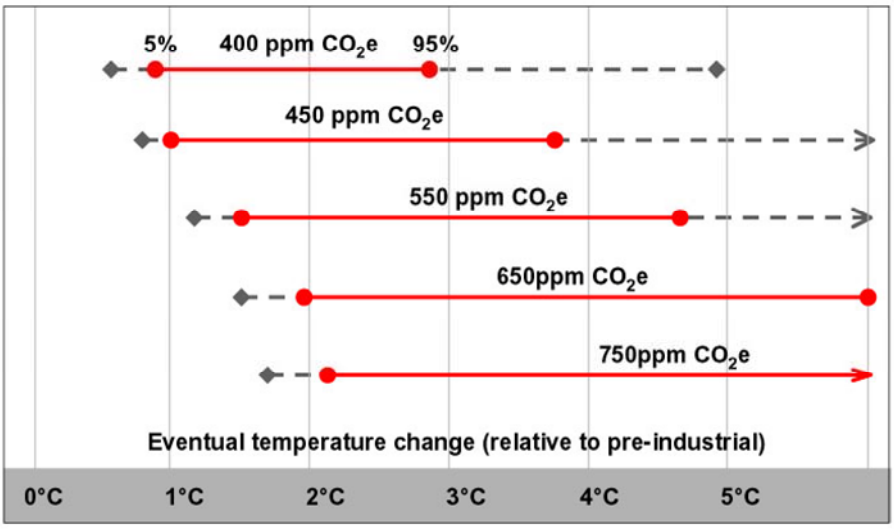
Friends of the Earth Europe

For more information, please contact
rosemary.hall@foeeurope.org;
+32 485930515

Climate change facts and figures

Most of the following facts are taken from the latest IPCC report, released on 2 February 2007[1].

- Eleven of the last twelve years rank among the hottest years since 1850, when records on global surface temperatures began.
- Global temperatures have climbed 0.76 degrees since the latter half of the 19th century and the rate of temperature increase for the last 50 years is twice that of the last 100 years. Even if the world would stop emitting greenhouse gases now, the global average temperature would continue to rise, due to the atmosphere's inertia.



Left: Chart shows range of possible temperature increase, depending on greenhouse gas concentration. Taken from Stern Report.

- The global atmospheric concentration of carbon dioxide has jumped 35 % since 1750. The current value is well over the average of the last 650,000 years, as shown by ice cores drilled out of the world's glaciers.
- Average temperatures in the world's oceans have increased down to depths of 3,000 metres. The oceans have been absorbing up to 80 % of the temperature increase, causing sea waters to expand and worsen sea level rise.
- The frequency of heavy precipitation has increased.
- Sea levels are currently rising at the rate of some 3 mm per year since 1993 and rose 17 cm during the 20th century. The rate of sea level rise from 1993 to 2003 was 42 percent faster than the rate from 1961 to 2003.

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[1] The report is available at http://www.ipcc.ch/SPM2feb07.pdf
[2] See for example in the EU's submission to the UNFCCC from October 2006 at http://unfccc.int/resource/docs/2006/cmp2/eng/misc03.pdf
[3] Chart taken from Stern Report; see also Meeting the EU 2 degrees Celsius climate target: global and regional emission implications; Michel den Elzen and Malte Meinshausen; available at http://www.mnp.nl/bibliotheek/rapporten/728001031.pdf

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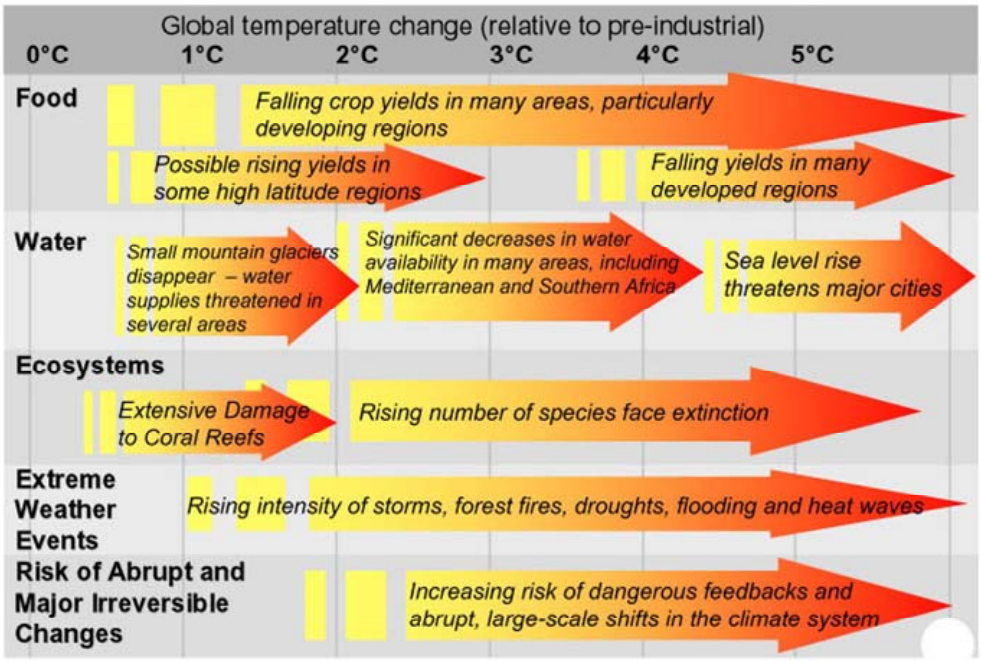
- Average temperatures in the Northern Hemisphere in the last 50 years were higher than in any other such period in the last 500 years and probably higher than in the last 1,300 years
- The average amount of sea ice in the Arctic has dropped by 8 percent since 1978; in summer it has dropped by 22 percent.
- The warming of the atmosphere and ocean along with the loss of ice show that global climate change can not be explained without human activity and is not due to natural causes alone.
- Sea level is expected to rise by 18cm to 59cm between 1990 and 2100.
- Weather extremes such as heat waves, drought and heavy rainfall will continue to become more frequent. Storms are likely to become more severe.



Left: Expected impacts of climate change, depending on temperature change. Taken from Stern Report

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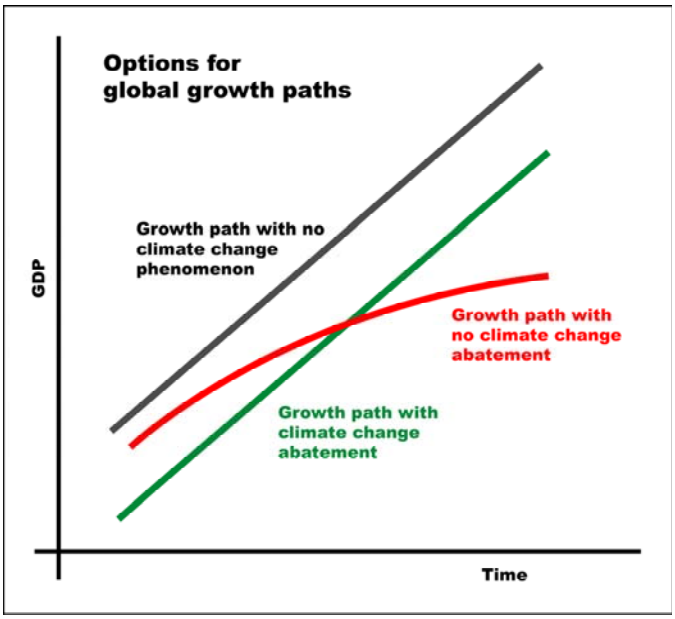
The economics of climate change, from the Stern Review

- Fighting climate change is fundamentally linked to the health of the global economy
- The effects of climate change could leave to global economic recession. The longer governments delay, the more costly climate change will be. The costs of climate change, averaged over time, over the regions of the world and across a wide range of scenarios, are equivalent to a loss in average world consumption of up to 20% per year[4].
- Immediate action to cut carbon dioxide (CO2) emissions is economically justified because catastrophic climate change could cost up to twenty times more than investing in CO2-cutting measures now
- A investment of one percent of the world's GDP now in technologies to reduce emissions would be enough to keep CO2 levels stabilised at 550 parts per million. These costs are not trivial in absolute terms, but they will not disrupt economic growth. It should be noted, however, that a 550 ppm greenhouse gas concentration will not be enough to stabilise global warming to below 2°C over pre-industrial levels.
- This cost/benefit estimate does not even take into account the added economic benefits of reducing emissions, for example reduced health costs because of reduced air pollution. This could be equivalent of a saving of one percent of the world's GDP.



Left: This graph illustrates the main findings of the Stern report: Unmitigated climate change will cost the global economy far more than any action to fight it. In fact, not fighting climate change will lead to a global recession.

[4] Stern report, by leading economist Sir Nicholas Stern and commissioned by the UK government. If you need to answer any questions about how Stern arrived at his estimates, this Frequently Asked Questions document is very helpful: http://www.hm-treasury.gov.uk/media/7CF/61/FAQ's.pdf

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Health, development and biodiversity: impacts of climate change

- 33,000 people died as a result of the heat wave that hit Europe in 2003.
- Rising temperatures will trigger a global animal and plant species extinction of unprecedented proportions. About a quarter of the world's animal and plant species may die out as a consequence of climate change over the next 50 years[5].
- The World Health Organisation reports that already now, 150,000 people die every year from climate change.
- The land area that is prone to drought has increased significantly in the past five decades[6] and one third of the planet could be desert by 2100.[7]
- If the average global temperature increases from preindustrial levels by two degrees Celsius, as many as 80 % of crops could fail in southern Africa.[8]
- A two degree increase in average global temperature could cause rising sea levels and ice melting forcing 150 million people living in Asia's coastal regions to move inland.[9]
- A two degree increase in average global temperature could cause 200 million more people living in areas prone to malaria. [10]
- A two degree increase in average global temperature could cause 500 million people who rely on Himalayan glaciers for their water supply experiencing severe shortages. [11]

[5] Extinction risk from climate change; Thomas et al.; Nature 2004, vol. 427.
[6] The surface area affected by extreme droughts has doubled over the past 30 years: 30% of world land area in the early 2000s, compared to 15% in 1970s. See US National Center for Atmospheric Research, http://www.ucar.edu/news/releases/2005/drought_research.shtml
[7] Eleanor J Burke, Simon J. Brown and Nikolaos Christidis, *Modeling the Recent Evolution of Global Drought and Projections for the Twenty-First Century with the Hadley Centre Climate Model*, Journal of Hydrometeorology, Volume 7, Issue 5, October 2006.
[8] Rachel Warren, Impacts of Global Climate Change at Different Annual Mean Global Temperature Increases, Tyndall Centre for Climate Change Research, ECF 2004.This research was also cited in *Avoiding Dangerous Climate Change*, a Department of Environment, Food and Rural Affairs' (Defra) report.
[9] Christian Aid: http://www.christian-aid.org.uk/indepth/0611climatechange/Kenya%20COP%20briefing%20Nov06.pdf
[10] Christian Aid: http://www.christian-aid.org.uk/indepth/0611climatechange/Kenya%20COP%20briefing%20Nov06.pdf
[11] Christian Aid: http://www.christian-aid.org.uk/indepth/0611climatechange/Kenya%20COP%20briefing%20Nov06.pdf

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The EU on emissions: contradicting its own analysis

- The EU has a climate target of keeping global temperatures below a **2 degrees Celsius increase** compared with pre-industrialised temperatures. This was adopted in June 1996 at a Council of Ministers meeting in Luxembourg.[12]

- The European Union, at last years Spring Summit, has noted that to respect the 2 degrees limit, atmospheric concentrations of greenhouse gases would have to "**remain well below 550 ppm CO2eq"**[13]. The truth is that for a 50/50 chance of meeting the 2°C target, concentrations need to stabilise **well below 450 ppm in the long term**. See also [3].

- In 1997, the then 15 member states of the European Union accepted a Kyoto target to cut greenhouse gas emissions by 8 percent from 1990 levels by 2012.

- Seven of those 15 countries are set to miss their Kyoto targets. The seven countries are Spain, Austria, Belgium, Denmark, Ireland, Italy and Portugal. Spain, Denmark and Austria are the worst performers, adrift of their targets by 27%, 18% and 7% respectively. [14]

- Overall, the EU is expected to rely heavily on buying carbon credits on the global carbon market in order to reach the 8 % goal by 2012.[15]

- Meeting the 2°C target would require global emissions to peak around 2015/2020 and be cut in half by 2050, compared to 1990 levels. Industrialised countries would have to make the biggest cuts, since they are not only mostly responsible for the problem but also have higher per-capita emissions than developing countries. The EU's per capita emissions are about 11 tons per citizen per year, which is twice the world average and about 4 times higher than where emissions should be in the year 2050. Consequently, the EU must cut their emissions by 80% by 2050 and by at least 30% by 2020[16].

- The European Commission itself recently acknowledged the need for 30% cuts by developed countries[17]. However, the Commission proposed only a 20% reduction target by 2020 (compared to 1990 levels) for the EU to adopt unilaterally, until other industrialised countries are ready to set a 30% target for themselves[18]. The Energy Council and the Environment Council have approved this target, and it is now up to the EU Spring Summit on 8th and 9th March to finally approve it.

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[12] http://www.europa-eu-un.org/articles/en/article_6667_en.htm
[13] http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/17&format=HTML&aged=0&language=EN&guiLanguage=en#fnB2
[14] http://www.eea.europa.eu/pressroom/newsreleases/ghgtrends2006-en
[15] http://www.eea.europa.eu/pressroom/newsreleases/ghgtrends2006-en
[16] Per capita emissions are from the CAIT project of the World Resource Institute. For the regional distribution of required emission cuts see Meeting the EU 2 degrees Celsius climate target: global and regional emission implications; Michel den Elzen and Malte Meinshausen; available at http://www.mnp.nl/bibliotheek/rapporten/728001031.pdf
[17] See for example http://europa.eu/press_room/presspacks/energy/iasummarysec7.pdf
[18] See *"Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Limiting Global Climate Change to 2 degrees Celsius, The Way Ahead for 2020 and Beyond"*. COM (2007) 2 final, 10 January 2007

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Energy Efficiency: neglected in the Energy Plan

- The European Commission has **acknowledged** that the EU could achieve a 20% reduction of energy consumption by 2020 (compared to business-as-usual) at zero net cost.[19]

- A 20% reduction in energy consumption is equivalent to 390 million tons of oil equivalent. Also, the cost of investing in more efficient and innovative technologies will be more than compensated by an annual fuel saving of more than 100 billion Euros. [20]

- The 20% reduction in energy consumption by 2020 is not proposed to become a target for the European Union, and the Energy Efficiency Action Plan merely aims at tapping into the potential rather than achieving it as a target. Consequently, the EU has made no concrete commitment to achieve the 20%.

- Energy Efficiency is not being addressed centrally in the EU Energy Plan. Actually, calculations elsewhere in the documents that make up the Energy Package implicitly assume that the 20% reduction target will be missed.[21]

- 50% of gas imports go to the buildings sector, 70-80% of all imported oil go to the transport sector (which accounts for a third of Europe's energy demand). But both areas are not properly addressed in the Energy Package.

- The energy saving potential is huge in the large stock of private buildings across Europe. For example, a typical Belgian house is as badly insulated as a typical house in Spain - despite the very different climatic conditions. But the energy efficiency of buildings will not be considered until 2009, making it unlikely that the 20% target will be met in this sector.

- The EU is set to miss opportunities to reduce energy consumption in the transport sector: Transport is under-emphasised in the Energy Efficiency Action Plan of 2006 and energy efficiency is neglected in the Energy Package of 2007.

- There are still no binding targets for car efficiency, years after the European Commission first suggested the introduction of binding efficiency standards of 120 g/km by 2010. Since 1998, the industry has a voluntary-only target, which is not only weaker (140g CO2 per km by 2008), but which carmakers not even on course to meet.

- A screaming example of car inefficiency is Volkswagen 's Passat Variant 1.9 TDI was voted German car of the year for 2005. Its emissions are 159g CO2 per km, **greater** than its predecessor model's at 154g.

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[19] European Commission Energy Efficiency Action Plan. Technically, a 40% saving is possible by 2020, and in some sectors or countries the potential is even 60% or more: http://ec.europa.eu/energy/action_plan_energy_efficiency/index_en.htm
[20] European Commission Energy Efficiency Action Plan: http://ec.europa.eu/energy/action_plan_energy_efficiency/index_en.htm
[21] In the European Commission's Communication "An Energy Policy for Europe" it uses a 'business as usual scenario' as a reference for the future energy needs of the EU. It presumes total primary energy consumption in 2020 is **1890 Mtoe**, while if the target of reducing energy consumption by 20% by 2020 was achieved, it would be **1500 Mtoe**.

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Renewable Energy: huge potential but needs a level playing field

- The EU had a goal in 1997 to increase their contribution of renewable to energy consumption from 6% to 12% by 2010. According the European Commission, this will now not be met – the EU is unlikely to get higher than 10% renewable share by 2010. Current shares are stuck around 6%. Also, the EU will miss the target set out in the Renewable Energy Directive to meet 21% of the EU's electricity demand from renewable energies.
- The new proposed target for primary energy demand met by renewable is 20% by 2020
- The EU is capable of achieving 25% renewable share given the technological improvements and opportunities that exist. [22]
- A 25% renewable share target is a long standing demand from the European Parliament.[23]
- The current proposal in the Energy Plan is a broad target, with freedom for Member States to set their own targets for different sectors. A broad target without breakdown into the specific sectors of electricity, heating and cooling and transport will threaten investment security. [24]
- Renewable energy creates jobs: It is more employment intensive than conventional energy generation and can lead to a thriving decentralised network of small and medium enterprises.
- In 2005, about 2.4 billion Euros were used to subsidise renewable energy in Germany. 2.8 billion Euros of external costs from conventional energy were avoided, which means that supporting renewable energies through such mechanisms as in Germany has net benefits for society. [25]
- BIOFUELS: Producing, processing and transporting biofuels can produce more emissions than saved by using these biofuels instead of fossil fuels. In other words, over the entire lifecycle, biofuels do not necessarily have net emissions savings. [26]
- BIOFUELS: The production of biofuels often leads to negative environmental and social impacts in producer countries, destroying rainforests, damaging biodiversity and undermining livelihoods of people or increasing food prices.

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[22] "Target 2020 – Policies and Measures to reduce GHG in the EU"; Wuppertal Institute and WWF 2005; see http://assets.panda.org/downloads/target_2020_low_res.pdf

[23] http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P6-TA-2007-0038+0+DOC+XML+V0//EN&language=EN

[24] The EC's own impact assessment of the Renewable Energy Roadmap concludes that failing to agree sector-specific targets will delay technological development and commercial deployment of renewable energies and increase climate change abatement costs in the long-term. It notes that "a single broad target is too unfocused and would fail to provide sufficient guidance and certainty to businesses operating in specific sector of the market." See 'Renewable Energy Roadmap - Impact Assessment', SEC (2006) 1719.

[25] "Externe Kosten der Stromerzeugung aus erneuerbaren Energien im Vergleich zur Stromerzeugung aus fossilen Energieträgern", Wolfram Krewitt; German Aerospace Centre; Barbara Schlomann, Fraunhofer Institute for System and Innovation Research, available from http://www.erneuerbare-energien.de

[26] http://dematerialism.net/Pimentel.pdf

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Transport: unsustainable trends chug on

- More than a quarter of Europe's overall greenhouse gas emissions come from cars, lorries, planes and ships.
- Rising transport-related emissions have outpaced reduction achievements in all other sectors.
- More than 70% of oil imports from outside the EU are used in the transport sector
- The transport sector accounts for more than 30 percent of the EU's final energy demand.
- The EU is set to miss opportunities to reduce energy consumption in the transport sector: Transport is under-emphasised in the Energy Efficiency Action Plan of 2006 and is neglected in the Energy Package of 2007.
- EU-wide measures to counter unsustainable trends in the transport sector are almost completely lacking.
- There are still no binding targets for car efficiency, years after the European Commission first suggested introducing binding efficiency standards of 120 g/km by 2010. Since 1998, the industry has a voluntary-only target, which is not only weaker (140g CO2 per km by 2008), but which carmakers are not even on course to meet.
- A screaming example of car inefficiency is Volkswagen's Passat Variant 1.9 TDI. The Passat was voted German car of the year for 2005. Its emissions are 159g CO2 per km, **greater** than its predecessor model's at 154g.
- The EU is considering counting the use of biofuels towards achieving the car efficiency target. This represents a lowering of the bar, since a 120g/km target would be perfectly feasible without biofuels
- BIOFUELS: Producing, processing and transporting biofuels can produce more emissions than saved by not burning fossil fuels in cars. In other words, over the entire lifecycle, biofuels do not always have net emissions savings.[27]
- BIOFUELS: The production of biofuels often leads to negative environmental and social impacts in producer countries, destroying rainforests, damaging biodiversity and undermining livelihoods of people or increasing food prices.

[27] http://dematerialism.net/Pimentel.pdf

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Subsidies for dirty energy: not addressed in the Energy Plan

- Nuclear energy research has received over 45 billion Euros of public money over the past 30 years.
- In 2003, subsidies for coal, oil and gas amounted to 23 billion Euros. In contrast, in 2003, renewable energy received just below 6 billion Euros. [28]
- The coal industry, in 2005 alone, received over 4 billion Euro of taxpayers' money.
- Every year conventional energy companies externalise hidden costs of around €40-70 billion to society, e.g. in the form of health costs from air pollution. [29]
- Due to the 'limited liability' of plant operators, only a tiny fraction of the damages of a Chernobyl type accident would be covered by the operators insurance. The rest would have to be paid for by society.

[28] European Environment Agency: http://www.eea.eu.int
[29] European Environment Agency: http://www.eea.eu.int

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+32 485930515

Nuclear power: not the solution to climate change or energy security

- Nuclear power remains the most dangerous form of energy. An accident like the 1986 explosion of the reactor in Chernobyl in the Ukraine could happen any day. And due to the 'limited liability' of plant operators, only a tiny fraction of the damages of a Chernobyl type accident would be covered by the operators insurance. The rest would have to be paid for by society.

- The question of what to do with highly radioactive waste remains unsolved.

- On a level playing field, nuclear power is economically insane. Not a single nuclear power station has ever been built without massive government subsidies. And new nuclear power comes at a high financial cost for society, if the real costs of nuclear power are properly taken into account. These costs include century-long waste treatment and storage, the decommissioning of old plants and the costs of potential accidents.
  (The European Commission has recently started investigations concerning illegal state aid for a nuclear power plant currently under construction in Finland.[30])

- Uranium is a finite resource that, even if nuclear energy capacity was kept at present levels, would last only 50 years.[31]

- Money invested in energy saving measures and renewable energies can achieve far greater emission reductions than if invested in nuclear power. [32]

- Nuclear power emits as much CO2 as a modern gas-fired co-generation plant. When assessing the overall emissions, the whole lifetime of a nuclear power station need to be part of the equation, including fossil fuels burnt during uranium mining, processing and transportation, building the nuclear power station and decommissioning as well as long-term waste storage and treatment.[33]

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[30] http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/1456

[31] "Nuclear Power: Myth and Reality - The risks and prospects of nuclear power" - by Gerd Rosenkranz, published by Heinrich Böll Foundation and WISE, Chapter 3: The Nuclear Fuel Cycle, p.22. http://www.boell.de/de/04_thema/4064.html

[32] *"Nuclear power saves as little as half as much carbon per dollar as wind power and as little as a tenth as much carbon per dollar as end-use efficiency"*: http://www.rmi.org/images/other/Energy/E05-14_NukePwrEcon.pdf

[33] *"If one takes into consideration the mining of resources [uranium], the transportation, the building and maintaining of nuclear power plants, the distribution of the electricity and the necessary additional production of heat, then nuclear power does often look worse for climate protection than other forms of energy production. A modern gas-fired power station in connection with heat production [co-generation] can be more favourable for the climate. Even better for the climate are renewable energies and most of all the efficient use of energy."* [own translation] - German Environmental Ministry, in: 'Atomkraft: Ein teurer Irrweg. Die Mythen der Atomwirtschaft', March 2006. See (in German) http://www.erneuerbare-energien.de/inhalt/2715/4592