

International Conference
Global Security in the 21st Century
Perspectives from China and Europe

Jointly organized by KAS and Institute of World Economics and Politics (IWEP), Beijing
September 18-19, 2007, Beijing

Climate Change as a Challenge: Possibilities of Shaping an International Climate Policy
Friedemann Müller, SWP

The climate change problem is probably the most extensive challenge for a global regime building in the 21st century. There is no doubt that a solution cannot be found without the participation of all big powers such as China, India, the United States, Russia and Europe. Although all these political powers are committed to the Climate Convention of 1992 and all of them signed the Kyoto Protocol in 1997, even if the U.S. did not ratify it, the differences in the position of the major powers towards the climate change problem are still huge while the time left to find a reasonable solution is rather limited. Let me divide my presentation into the following short chapters

- What is the global problem?
- In which direction do we move?
- Why is it so difficult to find a burden sharing that brings us closer to a solution?
- What sort of approach do we need?

1. The global problem

When during the 1980s the existence of the climate change problem became obvious among natural scientists, the Intergovernmental Panel on Climate Change (IPCC) was founded in 1988 under the auspices of two UN organizations. It consists of hundreds of experts, mainly climatologists from all over the world that represent the collective wisdom of natural science on the phenomenon of climate change. The IPCC has published since 1990 every five to six years extensive assessment reports. The Fourth Assessment Report consisting of different reports of the three IPCC Working Groups has been published, at least in a preliminary version, in 2007. Working Group III presented in May during a conference in Bangkok a 35 pages paper called “Summary for Policymakers”. The following chart 1 is taken from this paper and reduced to its core message.¹

¹ The extensive table is to be found in the annex of this paper as table 1

GHG Stabilization in the Atmosphere Average Data of Five IPCC Scenarios

Temperature increase	Peaking year of CO ₂ emissions	Change in emissions 2050/2000 (%)
2.2° C	2008	-70
2.6° C	2010	-45
3.0° C	2020	-18
3.6° C	2040	+35
4.5° C	2065	+55

Source: IPCC, Bangkok, May 4, 2007

Friedemann Müller
Global Security in the 21st Century
2

It says: Human activities which increased the greenhouse gas concentration in the atmosphere since the beginning of industrialization from about 280 to about 380 parts per million (ppm) today will continue to increase the concentration. Such a further rise of the concentration can be translated into increases of the global mean temperature. We, the human mankind, have to take a decision which rise of temperature will be the utmost acceptable. The table will show which measures have to be taken to keep the rise of temperature within these limits.

As I mentioned earlier practically all countries in the world including China, the U.S., India, the EU and Russia have signed the Climate Convention of 1992 and are bound to the goal of its article 2 which says: “The ultimate objective of this Convention ... is to achieve ... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”² The European Union has decided that this limit is to be defined by a 2 °Celsius increase of the global mean temperature. Chart 1 shows that such an ambitious goal requires an immediate peak of the global emissions and a reduction of global emissions until 2050 by 70 percent. Less ambitious goals leave more time but even a 3 °C increase requires a peak within the coming 13 years and a significant

² United Nations Framework Convention on Climate Change, Article 2 (signed in Rio de Janeiro 1992)

reduction until the mid of the century. A 3⁰ Celcius increase will, however, have serious impacts such as a significant sea level rise, droughts, floods, storms etc.

2. Into which direction do we move?

The reality is that we are moving in a very different direction than towards a peaking of global emissions in the foreseeable future and a substantial decline afterwards.³

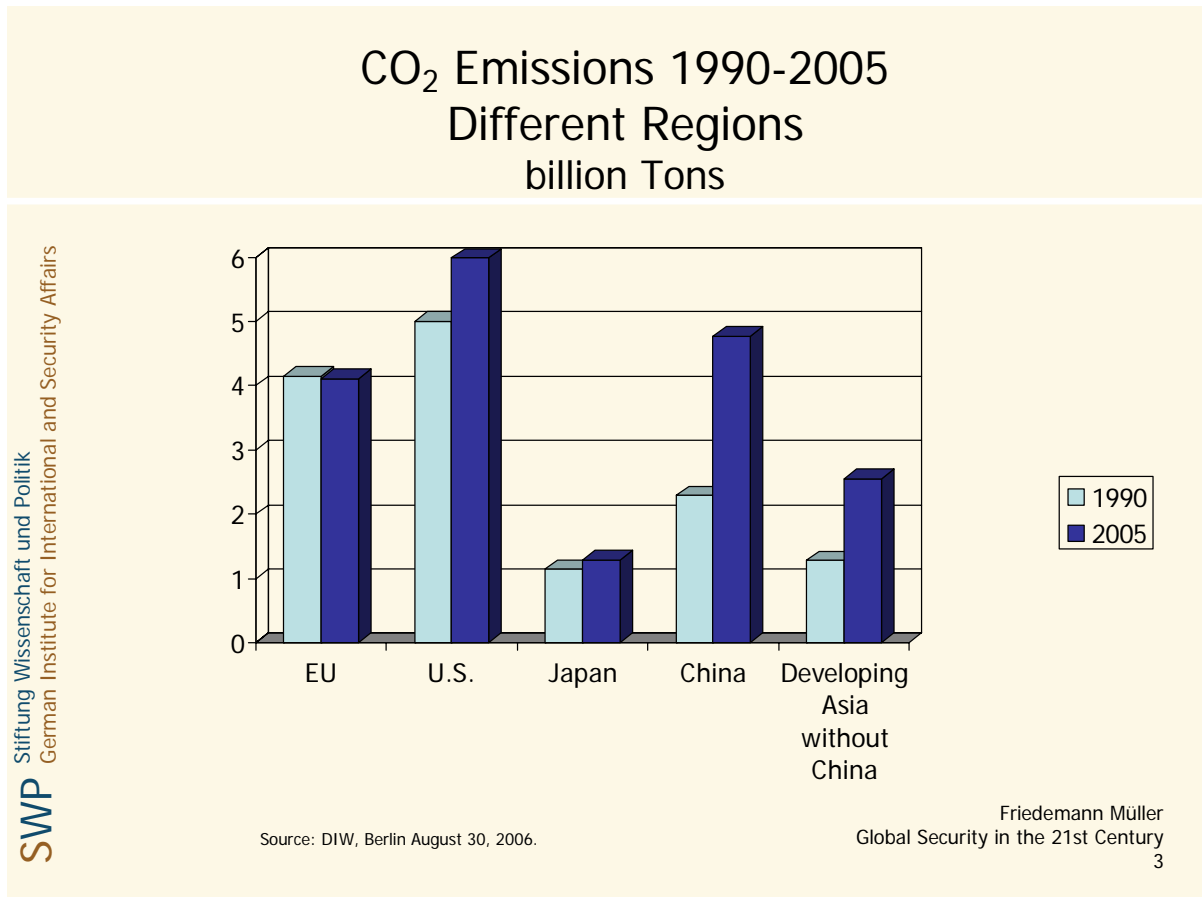
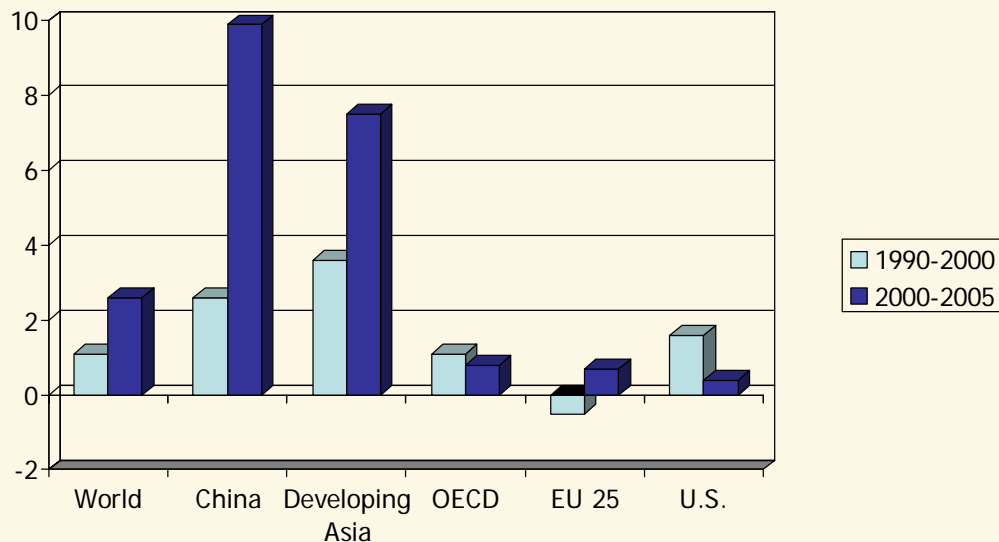


Table 2 (see also Annex 2) shows that industrialized countries started in 1990 – which is considered as the base year in the Kyoto Protocol and other climate change relevant commitments – from a high level of emissions with relatively low growth rates during the past 15 years, while China and the Developing Asia started at a low level of emissions with relatively high growth rates. The result is a 27 percent global growth of CO₂ emissions within these 15 years.

³ The following data refer to energy related CO₂ emissions which represent currently 84 percent of all greenhouse gas emissions. Not all countries report exact data on non-energy related greenhouse gas emissions which makes comparisons between countries or over time impossible.

Annual Average Growth of CO₂ Emissions (percent)



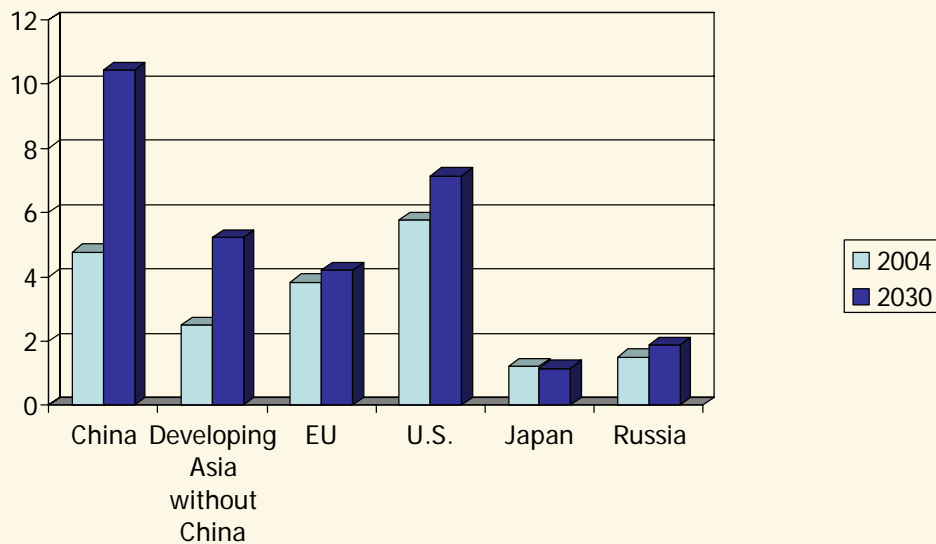
Source: DIW, Berlin August 30, 2006.

Friedemann Müller
Global Security in the 21st Century
4

Table 3 makes, however, the problem more explicit. It expresses a huge concern by showing that the annual average emission growth rate worldwide after the year 2000 is more than double as high (2.6 percent) as before 2000 (1.1 percent). This increase of the growth rate is especially visible in the case of China and developing Asia but on a smaller scale also even in Europe. Nothing indicates that a peak of global emissions is to be expected in the foreseeable future.

The International Energy Agency, the energy branch of the OECD countries, has presented a projection to the year 2030 in its latest “World Energy Outlook”. The reference scenario which reflects the current climate policy including “Kyoto” and other agreements and commitments says that global CO₂ emissions will increase between 2004 and 2030 by 55 percent. All big emitters besides Japan will contribute to this growth as chart 4 (or table 3) shows.

CO₂ Emissions of different regions 2004-2030 IEA Reference Scenario billion tons

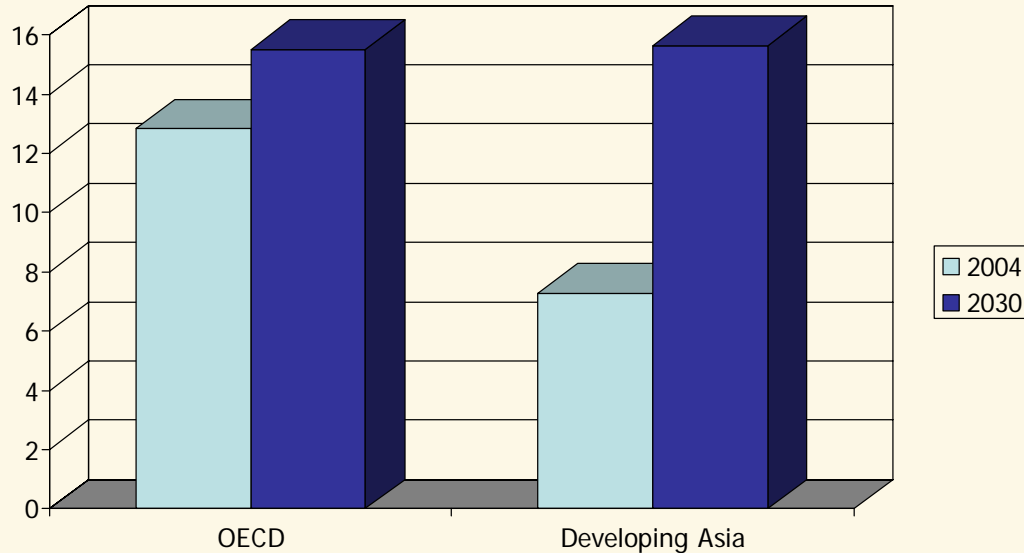


Source: IEA, World Energy Outlook 2006.

Friedemann Müller
Global Security in the 21st Century
5

The two regions that will contribute almost 80 percent (exactly 77 percent) to the global emissions in 2030 are the OECD countries and Developing Asia as chart 4 (or table 3 in the annex) shows. Both regions will have a share of close to 40 percent to worldwide emissions according to this projection.

CO₂ Emissions OECD Asia 2004-2030 IEA Reference Scenario billion tons



Source: IEA, World Energy Outlook 2006.

Friedemann Müller
Global Security in the 21st Century
6

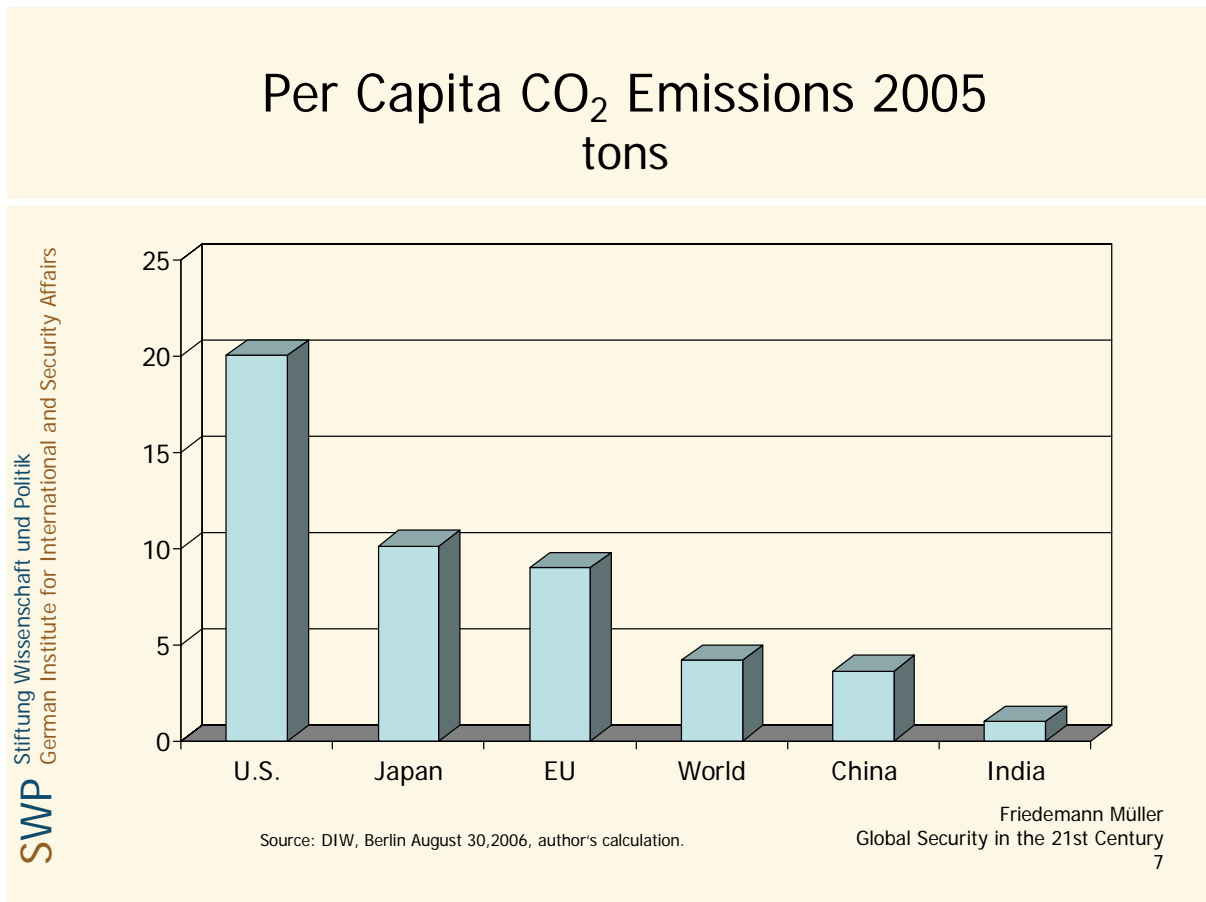
These two regions share a major responsibility to solve the global problem.

3. The disproportion of any burden sharing

The experts are aware that the problem cannot be solved unless the positive growth rates of global CO₂ emission turns into a negative growth rate soon. The question how to reach this offers different answers in different regions of the world. The main arguments are the following two

- It is true that historically the OECD countries are the main emitters, they should do the first step to solve the problem. As long, however, as the emerging economies particularly in Asia with the high emission growth rates are not part of a commitment structure the turn from positive to negative growth rates is not manageable. This is an American argument increasingly shared in the community of OECD countries, even if European countries understand the rationale of argument two;
- as long as the differences of per capita emissions are as high as they are in reality (chart 6) and the per capita emissions in Asian emerging economies are below world average there is no reason to restrict emissions and put thus a burden on economic

growth in these countries; an argument spread in China, India and other emerging economies.



The advocates of argument 1 say that per capita emission is an important indicator but the efficiency of energy consumption and emission abatement is also important and this efficiency is much higher in OECD countries. They are also the pioneers that are taking the R&D burden of developing alternatives to the carbon emitting energy consumption. Therefore, they need a bonus in an agreement.

The advocates of argument 2 say that emerging economies are making up for what industrialized countries have developed in the 20th century, now under conditions of much higher raw material prices. The efficiency of energy consumption is higher than in industrialized countries during the comparable period of development.

No solution to this urgent problem will be found if both sides stick to their position and do not compromise.

4. Approach to a solution

It is obvious that a global emission peak within the coming ten years requires a peak in OECD countries before and in Asian countries after this date but both sides have to make major efforts not only to decouple the CO₂ emission growth from economic growth but gradually to decarbonize the energy consumption at least the emission relevant energy consumption.⁴ Even China's per capita emissions have in the year 2050 to be significantly below today's if a mean temperature increase of 3 °C is to be avoided.

Any realistic solution has to observe the following frame:

- Even if the rigid European position of a 2 °C mean temperature increase finds no consensus we need a decrease of CO₂ emissions until 2050 by at least 30 percent which means a per capita emission of 2.1 tons in 2050, roughly 40 percent below China's today's per capita emission.
- Equal emission rights per capita should be the main guideline for the mid century. Since an immediate equal distribution of emission rights per capita would mean a breakdown of the world economy a transition path from today's distribution to a desirable distribution in 2050 should be found. This follows, for instance, a recommendation of the German Advisory Council on Global Change (WBGU).⁵ This path is a matter of negotiations. It is clear that the path is organized in a way that forces the OECD countries with high emissions per capita a relatively sharp reduction of emission right after the year 2012 while emerging economies should be given increasing emission rights until about 2030.
- In addition to the per capita criteria, the efficient use of energy should also be given a premium in order to support pioneer development of efficient technologies.
- An international system of monitoring the emissions and for the distribution of emission rights should be established.

Without such a frame it is hard to imagine that a global regime for solving the climate change problem can be developed. If the frame is accepted and the regime should follow the least cost principle, a global emission trading system is to be established. The global bank which administers the allocation and supervises the trade of emission rights should auction a share of the emission rights and redistribute the proceeds from the auction in order to support further projects for global efficiency improvements.

⁴ Coal is more available in most regions of the world than other fossil energy carriers together. If it can be made feasible to capture the CO₂ before emission and sequester it in caverns, this could be a climate neutral use of fossil energy

⁵ Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen, Über Kioto hinaus denken, Sondergutachten, Berlin 2003, p.3

It is obvious that economies with high per capita emissions would have to buy emission rights from those economies with low emission rights. The system implies a significant net transfer of money from rich to poor countries, from North to South, or from industrialized countries to emerging economies and least developed countries. It is also obvious that each country must be interested to improve its efficiency of energy use with regard to carbon emission. The developed countries in order to minimize the amount of payment in the emission trading and the less developed countries in order to maximize the available emission rights they can sell. The challenge to political negotiation is to balance the interests of those who will be the main buyer and those who still can sell emission rights.

How can such a solution be processed? The time is urging not only because the limitation of emission is to be managed but also because the international negotiations within the Climate Convention framework make decisions necessary. The Kyoto Protocol is running out in 2012. A successor regime has to be negotiated so that all stakeholders are informed about the future regime sufficiently early before 2012 when it has to come into force so that all the necessary preparations can be put in place. The next Conference of Parties of the Climate Convention (191 parties including China and the United States) will take place in Bali in December 2007. Yvo de Boer, the executive secretary of the UNFCCC said. "What I hope Bali will agree on is a negotiation agenda over the next two years that will craft an effective long-term post-2012 regime."⁶

China must articulate its interest and take responsibility as one of the two largest emitter world wide. Efficient measures in order to solve the global climate problem will have an impact on all economies including the Chinese. Not acting has an even bigger impact as serious studies including the Stern Report⁷ have proven. Stern argues that not acting would bring a more than 5 °C temperature rise with more than 50 percent probability and cost about 5 percent of the global GDP while keeping the greenhouse gas concentration under 550 ppm only about 1 percent. The world needs China's cooperation and China needs, like the rest of the world, a solution of the climate change problem.

⁶ CO2-Handel, 14.08.2007, http://www.co2-handel.de/article184_6451.html

⁷ Stern Review on the Economics of Climate Change, Cambridge 2007, http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

Table 1: Greenhouse Gas Concentration in the Atmosphere
IPCC Stabilization Scenarios

Category	CO ₂ equivalent Concentration ppm	Global mean temperature increase degree Celsius	Peaking year for CO ₂ emissions year	Change in global CO ₂ emissions 2050 vs 2000 (%)
I	445 - 490	2.0 - 2.4	2000 - 2015	-85 to -50
II	490 - 535	2.4 - 2.8	2000 - 2020	-60 to -30
III	535 - 590	2.8 - 3.2	2010 - 2030	-30 to - 5
IV	590 - 710	3.2 - 4.0	2020 - 2060	+10 to +60
V	710 - 855	4.0 - 4.9	2050 - 2080	+25 to +85

Source: IPCC, Working Group III, Summary for Policymakers, Bangkok May 4, 2007, p. 23

Table 2: CO₂ Emissions 1990 - 2005
billion tons

	1990	1995	2000	2005	change 2005/1990 (%)
EU-15	3.36	3.28	3.36	3.50	4
EU-25	4.15	3.94	3.96	4.11	-1
U.S.	5.01	5.33	5.86	5.99	20
Japan	1.14	1.22	1.25	1.29	14
OECD	11.69	12.17	13.06	13.56	16
China	2.29	3.01	2.97	4.77	108
Developing Asia ¹	3.57	4.72	5.09	7.32	105
World	21.57	22.49	24.02	27.35	27

¹: Asia minus OECD Countries Japan, South Korea, Turkey

Source: H.-J. Ziesing, DIW, Wochenbericht 35/06, Berlin, August 30, 2006, p. 488/493

Table 3: CO₂ Emissions 2004 - 2030
IEA Reference Scenario
billion tons

	2004	2030	growth absolute	percent
EU	3.85	4.22	0.37	10
U.S.	5.77	7.14	1.37	24
Japan	1.21	1.15	-0.06	-5
OECD	12.83	15.50	2.67	21
China	4.77	10.43	5.66	187

Developing Asia	7.27	15.65	8.38	115
World	26.08	40.42	14.34	55

Source: IEA, World Energy Outlook 2006