Nuclear energy: The clean air energy - a remedy for the greenhouse effect?

In the framework of the international negotiations on global climate policy the nuclear industry is trying to get nuclear energy accepted as a tool in the struggle against the greenhouse effect. They claim nuclear energy will contribute to the solving of the climate crisis. This is not the case. Nuclear energy is neither efficient nor effective in cutting CO_2 emissions, is not an endless energy source and causes problems humanity can not handle.

Over the last years, nuclear energy has been portrayed as an useful tool in the battle against the greenhouse effect. This is because no CO_2, the most prominent of gases causing the climate problem, is said to be expelled in the production of electricity with nuclear power stations.

A little bit less is not enough; nukes do emit CO_2

Taking into account all the steps needed to produce electricity in a power station, nuclear energy (indirectly) does emit CO_2 although far less than coal, oil and gas. But much more than most of the already-existing real sustainable options. Different studies in the past years have shown that emissions from nuclear power are comparable to that of gas fuelled Combined Heat and Power plants. Emissions related to nukes are caused by uranium mining, enrichment, transport and building power stations.
The nuke-related CO_2-emissions will grow, mainly due to the impoverishment of future uranium sources which will lead to a gradual increase in the amount of energy needed to win the same amount of useful uranium. There is only a limited supply of rich uranium ore. The richer ores are being mined now with the result that there is a steady decrease towards 0.01% per 1000 kg or even (other sources) 0.004 percent uranium, which results in a nuke-related CO_2 emission of 230 grams/kWh.

Direct and indirect CO_2 emissions (gram/kWh)

Fuel	**Emission**
Coal	924
Procured Mineral Gas	800
Natural Gas	448
CHP	150
Uranium	73-230

So, ok, nukes do emit greenhouse-gases - but less!! Everyone knows we will need every contribution to save the climate...so, LET'S NUKE THE CLIMATE!

How to spend the money??!

The cost-efficiency of nukes

Climate protection will take loads of money. Every dollar has to be spent as efficient as possible. The cost of avoiding the emission of 1000 kg CO2 differs for every measure taken.A whole range of studies have clearly shown that nuclear power is about the least effective option.

New nuclear power plants are unlikely to be constructed in the near future because of high capital costs, Wall Street looks at short term returns which nuclear plants cannot provide.

Yearly costs per 1000 kg avoided CO2 emission ($/1000kg)

Measure	Costs
Average of 6 saving measures in households	-31.8
Electricity conservation metal Industries	-37.1
Industrial CHP large	-18.5
Electricity conservation chemical industry (bulk)	10.6
Hydropower	31.8
Biomass	31.8
Windpower	63.6
Nuclear power	68.9
Solar cells	132.5

OK, so nukes emit CO2 and are very costly but still, let's do it. There is enough money to spend; the rich countries have to help the poor ones. Reductions and saving are fun but not that good for the economy. Let's nuke the climate; let's build nuclear power stations

Necessary expansion of nuclear power needed for climate protection impossible.

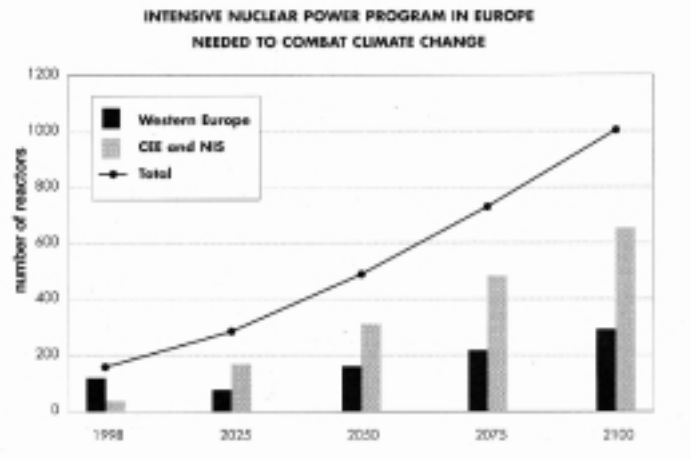
A rapid increase in the share of nuclear power for the global electricity market will prove to be impossible for several reasons.

First of all due to the limited supplies of uranium. The estimates vary greatly in source and research. To stay on the safe side we take estimates from the industry itself. The pro-nuclear think tank Forschungszentrum Technik und Umwelt in Germany estimates the worldwide uranium supply to be 6.4 million tons. If nuclear power, in the framework of global warming politics, would take care of 70% of the electricity need, as is the case in France, there would be 6.2 million tons of uranium needed until 2015. From 2015 this would be 0.5 million tons anually. The known resources of 6.4 million tons would therefore run out in 2016-2018.

The OECD-NEA and IAEA explicitly point out that there is an imminent chance of large shortages. It is difficult to accelerate production. One reason is the approximately eight year stretch it takes for the new uranium mines to be put into production. Another reason is that the existing mines are grappling with ever tightening environmental rules, which is hampering a higher production pace. The data in the periodical NEA/IAEA reports point to insufficient production capacity now and in the future.

But, says the industry, if we really need it we will find it and if we really need to protect the climate costs are not the most important factor.

Suppose the political choice is made to offer a greater significance to the role of nuclear energy , how many extra nuclear power stations would need to be built. For a scenario where 70% of electricity would come from nuclear power, an increase of an average of 115 nuclear power stations of 1000 MW each would have to be constructed annually. Estimates for the International Panel on climate Change suggest that within the European continent, 1000 reactors would need to be



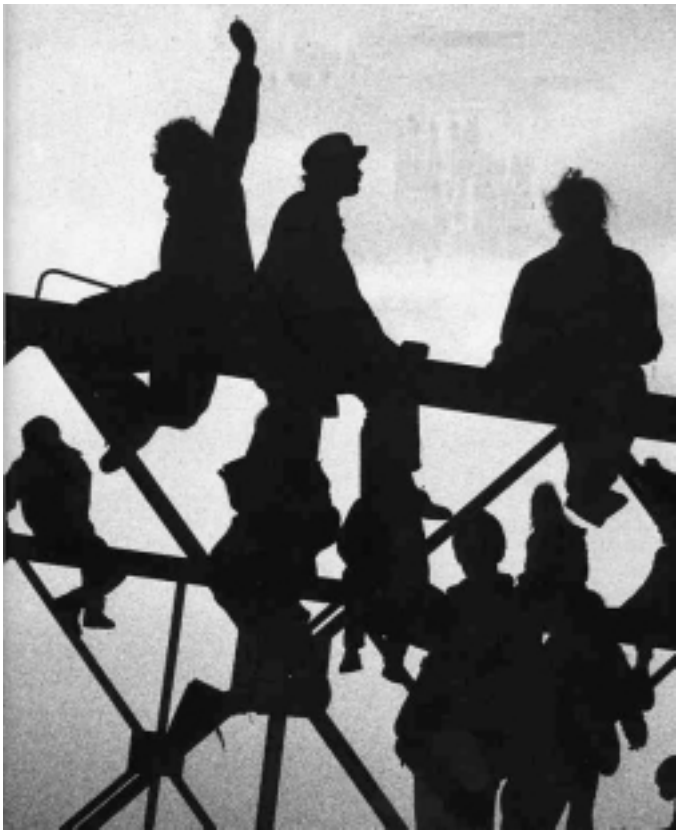
operational in 2100, six times the current level. The average construction time of a nuclear power plant is now ten years. The total production capacity of the nuclear industry, according to the German Öko-Institute, is eighteen nuclear power stations a year.

In the past 15 years the growth of new installed nuclear capacity fell significantly. From more than 25,000 MW growth in the late 80s down to only 731 MW in 1999. Possibilities for building new commercial reactors are very limited. Costs are high, resistance is growing, there is almost no, or very slow improvement in safety development and there is no solution for the waste.

The United States have not ordered new reactors for over 20 years, in Western Europe more and more countries are pulling out or are at least not building any new stations, Japan, Korea, Taiwan, Thailand, China are all reconsidering their nuclear energy ambitions. Public resistance against nuclear energy is fierce and, in countries where governments still believe in nukes, fast growing. Since the 70s the environmental movement has developed in a mass movement, one of its main issues being nuclear energy. They are supported by a wide range of trade unions, churches, political parties, youngsters, employers, industries and science.

Recent victories in the struggle against nuclear power were achieved also because of public resistance: Turkey, Japan, Taiwan.

NGOs and activists from both the South and the North will gather in The Hague (Netherlands) to put pressure on the delegations, meeting for the Sixth Conference of the Parties (COP6) in November. The global environmental community sees the nuclear issue as one of the most controversial aspects of the negotiations. They widely demand an explicit exclusion of nuclear energy from the so-called flexible mechanisms.



Problems, problems, problems...*Problems, problems, problems...*

So nukes emit greenhouse gases, are very costly and we just cannot build enough to make a difference - even if we could convince the people of this planet - and the market.

We don't care, the flexible mechanisms offer us possibilities we just cannot ignore. We know we cannot sell them in Europe, the United States, Japan, Australia, not even in the countries of the former Soviet Union. Let's sell them to the South - it's not fair only us having the costs of waste management, damage control and health care - not to mention the political problems.

The Flexible Mechanisms: A new subsidy for nukes?

Through the Kyoto Protocol on climate change the nuclear industry hopes to get credit for something it cannot deliver: Clean, environmentally friendly, non-polluting and cheap energy production. The so-called flexible mechanisms (Clean Development Mechanism and Joint Implementation) will allow developed nations to build power stations in other countries and get a pollution credit if the new plant leads to reduced greenhouse gas emissions. In essence it's a worldwide pollution trading credits scheme.

One of the CDM's primary objectives is to help developing countries achieve sustainable development by subsidizing previously unsubsidized industries.

Pushers of nukes in the CDM (Japan, USA, Canada, France, UK) claim they do not want to limit developing nations to certain technologies - that these countries should decide for themselves which technologies are sustainable and which not. Of course there are developing countries favouring the nuclear option; they will get cheap base-load capacity and at the same time have access to technology known for its possibilities to use it for the production of nuclear weapons. It are also countries not known for their willingness to let their own population decide on their

common future (China, S.Korea, Vietnam). The Kyoto Protocol allows for very little equitable public participation. A mechanism ensuring that the citizens of a nation really want a certain technology simply does not exist. Additionally, many developing countries fear nuclear power CDM credits will favor high-growth projects in developing countries over smaller sustainable projects in non-nuclear developing nations.

As an Indonesian official commented I think its simple colonialism to push nuclear power onto developing countries, leaving them with all the burdens that come with it . Countries of the AOSIS (Alliance Of Small Island States) do not support the use of nuclear power to address global climate change even though their island nations stand to lose the most from sea level rise.

The future of hundreds of millions all over the globe depends on what the delegations will discuss and decide; will they nuke our climate!?

Sources and further reading:

Climate Change and Nuclear Power. WWF World Wide Fund for Nature.; April 2000, Switzerland.

Dilemma study: Study of the contribution of Nuclear Power to the reduction of Carbon Dioxide Emissions from Nuclear Electricity Generation. ERM Energy, UK on request of the Commission of European Communities, Directorate General XVII, July 1999, Brussels, Belgium

Nuclear Power, The Costs and Potential of Conventional and Low Carbon Electricity Options in Western Europe.. IPSEP, California, USA on request of the Dutch Minister of Environment. 1994

Vom Ende der Mär: Atomkraft und Klimatschutz. Öko-Institut e.V. Darmstadt/Freiburg, Germany April 1996.

Review and recommendations on Climate Change and Japan s energy policy. Studygroup on Climate Change and Nuclear Energy. December 1997

World Nuclear Industry Handbook 2000 Nuclear Engineering International, UK

Uranium: Resources, Production and Demand. IAEA and OECD-Nuclear Energy Agency 1995, 1997 (periodical) Paris, France

---

WISE Amsterdam, the World Information Service on Energy, is a small but dedicated organization fighting against nuclear power. We have done so since 1978 as a part of an international network of small WISE offices all over the globe. WISE Amsterdam produces the bi-weekly News Communique, a magazine on nuclear energy news and backgrounds, maintains a huge library on nukes and is involved in campaigns, educational - and media work, direct actions and lobby work.

WISE has, together with others, taken the responsibility to get the anti-nuke message across during the climate negotiations in the Hague. November 13 will be the day of anti-nuclear activities - although we will be there for the whole period!

If you want to join or if you want any additional information, contact us at
WISE Amsterdam
Po. Box 59636
1040 LC Amsterdam
The Netherlands
Ph: + 31 20 6126368
Fax: +31 20 6892179
Email: wiseamster@antenna.nl
WWW: http://www.antenna.nl/wise/

WISE - September 2000
This publication has been made possible by funding from the NCDO