

climate protection:
false friends (part II)

CO₂ capture and storage



The Earth's climate is changing, because too much greenhouse gas is entering the Earth's atmosphere. The most significant greenhouse gas is carbon dioxide (CO₂). We mainly produce CO₂ through burning coal.

Since coal still plays an important role in our scenarios for future supplies of energy, it should be made "climate-friendly" – via CCS, Carbon Dioxide Capture and Storage. With this technology CO₂ is to be separated out in the power stations and then stored underground. However, can CCS deliver what it promises?

Electricity from coal endangers climate targets

In order to slow down the increase in concentrations of greenhouse gas, the signatory states of the 1997 Kyoto Protocol agreed to reduce emissions of climate-damaging gases by 2012 and by at least five percent compared to



The problems with CCS are immense. Even if the coal lobby would have us believe otherwise.

1990 levels. A halving of worldwide CO₂-emissions is called for by 2050, whereby the industrial nations must accomplish the lion's share at more than 80 percent.

More than 40 percent of worldwide CO₂-emissions are caused by coal being burned, and coal together with oil, is the world's most important fossil energy-feedstock. How long it will last is a matter of contention. Generous estimates reckon with 125 years, others believe that reserves are dramatically overestimated.

Whatever the answer: In planning simulations for worldwide energy supplies it plays an important role.

At over 40 percent, coal has the highest proportion of all, in the production of electricity. More than eight billion metric tons of damaging greenhouse gases are spewed into the atmosphere each year via electricity generated from coal, a catastrophe for the climate. The main sources of emissions are China and the USA, followed, by a considerable margin, by India, Japan and Germany.

CCS – the cleaner

And so the idea was born out of this dilemma, to separate CO₂ during coal firing in the power station and to store it in underground deposits. The magic word is CCS, Carbon Dioxide Capture and Storage. Above all, power companies see here a possibility of continuing to use the raw material of coal in the age of climate change and to increase the acceptability of building new coal-fired power plants. On a national as well as on an international level, CCS is discussed as a future building block in climate-protection programmes. Even in the



More and more coal-fired power stations obstruct expansion of photovoltaics as well.

discussions about a Kyoto follow-up agreement, this technology is to be utilised as an instrument against climate change: The coal industry endeavours to have CCS recognised as a Clean Development Mechanism (CDM). With the export of CCS technology, CO₂ savings attained in developing countries are to be rewarded with emission rights – a gain for the notorious polluters back home, but a zero-sum game for the climate.

Whether the idea of "clean coal" can live up to its promise, is quite uncertain. Uncertainties accompany the entire process, from the separation, through to transport, and right up to storage. The separation technology is in its infancy and far from a commercial application, and according to the prognoses will only be technically matured by 2020. A 100-percent separation of the carbon dioxide cannot be guaranteed. Furthermore, the procedure requires so much energy itself that the effectiveness of the power stations will decline by at least ten percent. In addition, there is the

construction of pipelines through which the separated CO₂ is to be transported from the plants to the storage locations.

And where is the CO₂ supposed to find its last resting place? Abandoned oil and gas fields are under discussion as well as salt strata deep below the Earth's surface. Although today, nobody can say whether carbon dioxide will remain securely encased during an envisaged time period of 10,000 years. In order to achieve a positive effect upon the climate however, total reliability is absolutely essential. If the containment enclosure proves not to be completely airtight and the greenhouse gas can escape, then CCS will bring about only a delay in CO₂ emissions. The true purpose of it would be lost, and CCS would not prevent even the smallest amount of carbon dioxide.

CCS – the blocker

It is with firm belief in new technology that countries with domestic reserves of coal are planning the construction of coal-fired power stations, with China and the USA leading the way, but also including India, Australia, Russia and Germany. New power plants will be in operation far into the second half of the century, all climate targets will be undermined and the expansion of a really carbonless energy supply with renewable energies will be blocked. Coal-fired plants cannot be upgraded with CCS technology before 2020, if at all – for the climate, this is much too late.

CCS would rival renewable energies in another field of activity as well: Once a possible CO₂ storage area has been declared, it can no longer be used otherwise. The possibility, for instance of utilising geothermal energy at the same site, is out of the question. And finally, there is a further special risk: If odourless carbon dioxide escapes from a leaking storage site, it can accumulate for example in a terrestrial depression, since it is heavier than air, and if anyone enters such a hollow, they will be asphyxiated due to the lack of oxygen necessary to breathe.

Coal is actually inappropriate

If coal is used in large-scale electricity production even in future, climate targets will remain unattainable. Each new coal-fired power plant, which on average remains on line for 40 to 50 years, consolidates the position of climate-damaging energy policies. Energy supply of the future will be efficient, regenerative, flexible, decentralised and consumer-oriented. This would also include conversion of the present production and network structures. Coal-fired power plants, whose output cannot be flexibly adapted to the fluctuating electricity production from sun and wind, are then actually quite inappropriate. They are not even suitable as so-called bridging technology, not even if CO₂ is separated out. Adhering to the use of coal-power can be an expensive failure – through meagre CO₂-certificates within the scope of the emissions-trade, rising raw-material prices and – should it come to this – through the immense costs of the planned CCS technology.



Electricity from coal accelerates climate change, whether CCS or not.

- × **Coal-fired power stations are climate killers**
- × **CO₂ sequestration is unproven**
- × **CO₂ storage is hazardous**

The Munich Environmental Institute thus calls for:

- ✓ No new constructions of coal-fired power stations
- ✓ No recognition of CCS projects as a “Clean Development Mechanism”

The Munich Environmental Institute campaigns for the following targets:

- ✓ Reduction of energy consumption and increases in energy efficiency
- ✓ Expansion of renewable energies
- ✓ Conversion of energy supplies via intelligent electricity networks
- ✓ Decentralised and flexible power stations

www.umweltinstitut.org



The Munich Environmental Institute (Umweltinstitut München) is an independent and non-profit association.

Since the reactor catastrophe at Chernobyl in 1986 we have been examining foodstuffs and other samples for radioactivity and fighting against nuclear power. During all this time we have also campaigned for regionally produced food free of gene technology, and against genetically modified organisms in the environment.

We advocate a lasting economic strategy and a consistent climate protection policy. We support an expansion of renewable energies, uphold healthy nutrition and encourage the precautionary principle for all environmental dangers, such as for instance with the construction of mobile telephony installations.

Our targets include the shutting down of all nuclear installations, food free of gene technology and ecological, small-farm agriculture. To support these goals, we provide consumer education, provide public relations and develop campaigns.

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