

Fact Sheet 1: Safe Energy

Climate protection is feasible



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Climate protection is feasible

The latest global climate report of the Intergovernmental Panel on Climate Change (IPCC) of the UN made unquestionably clear that climate change is happening (1). Prompt and worldwide action could limit the CO₂ concentration in the atmosphere at 400 ppm and thus limit the global warming to a maximum of 2 °C. If we exceed this limit of temperature increase, the consequences are projected to be unmanageable. Leading scientists say that we only have 10 years left to change this trend. Keep in mind: climate change affects us all: every individual, every community, every business and every country.

The fossil fuel energy sources: coal, oil and gas currently account for more or less 80-90% of the total global energy production. 30 million tons of CO₂ are emitted worldwide; 75% of these derive from fossil fuels. We need a fundamental change in how we deal with energy and resources. The CO₂ emissions have to be reduced as quickly and effectively as possible, through energy savings and adoption of renewable energy sources for electricity, heating and transport.

Through energy conservation, a great deal of CO₂ reduction can be achieved in a relatively short period of time. In the middle and long term it is necessary and strategic to replace nuclear power generation by renewable energy sources.

The commitments for CO₂ reductions that have been made by some regions are setting a good example, especially some areas in the south of Germany. They want to provide for their total energy needs in a local and sustainable way, to strengthen the regional economy and create new jobs. An advantage of this is an example of the Starnberg region which approved a local governmental decree, in which the goal of complete adaptation of the region to renewable energy is by 2035, through:

- Reduction of energy use;
- Introduction of innovative and efficient energy sources;
- Sustainable use of all local energy sources.

A detailed study of energy use and the potential of renewable energy sources and its potential for the Starnberg region showed that the final conclusion is feasible. Still, three percent of the total energy use per year should be saved. The remaining energy gaps can be closed by renewable energy sources like water, wind, sun, thermal and biomass from sustainable forestry. Solar energy as well as electricity and heat from enhanced geo-thermal systems make up the biggest regional resources.

Climate protection- saving energy

We have the opportunity and the awareness of the options to meet the climate change challenge. We have significant potential to reduce CO₂ emissions. In all areas of society, including corporations, public facilities like Kindergartens, schools, high schools, recreation facilities such as swimming pools, governmental buildings, sport parks, churches,

clinics, elders residences, and last but not least private households - energy efficiency and saving measures can be realized everywhere by use of energy saving appliances, optimized heating systems, housing improvement (insulation, ventilation, windows etc.), avoidance of energy losing stand-by-modes, the construction of passive houses (ultra-low energy buildings) etc. Additionally, reducing use of motorized transit, driving fuel-efficient cars and using public transit will all help our climate.

Climate protection- expand renewable energy sources

Renewable energy sources are essential in order to be able to cope with the challenges of the climate change and the shrinking fossil fuel resources. The options are numerous. Iceland, for example, is blessed with thermal heat, and Norway with hydropower, countries with a lot of sun can use solar thermal power plants. In Germany the north is suitable for wind power, whereas the south would benefit more from solar power. The renewables' share in Germany's energy provision is already considerable. In 2006, for example, renewables' share in electricity production was 12%, in heat production 6% and in fuels 6.6%. The release of 100 million tons of CO₂ was avoided. In coming years a rapid expansion, especially in the electricity and heating sector, is expected to occur.

Worldwide the greatest amount of energy is used to provide for heating and transportation. Growing fuels in households, industries, power plants and cogenerations (CHP's) as well as biofuels for engines, currently



contribute considerably to these sectors. However, expansion of agro-fuels production potential is limited due to its competition with food production, nature conservation, its often net energy loss in production as well as social problems.

One important possibility for sustainable heat production is solar heating systems. Solar collectors can provide the heating of both water for domestic use and heating water as well as the heating for water in swimming pools and thus eliminate the use of oil and gas. With the quickly rising prices of fossil fuels, one can anticipate increased demand for solar heating.

A relative newcomer is the usage of geothermal heat from inside of the earth in the 'Nahwärmeverorgung', where, in contrast to the heat supply of entire cities or districts, the access to and distribution of heat takes place in the immediate vicinity of the site of energy production (e.g. individual geothermal heating production for some homes in the neighborhood or for business building.)

Although its current global share is relatively small, photovoltaic systems, which transform sunlight directly into electricity, are also a promising alternative for the future. Solar energy is available in abundance, and one may assume that photovoltaic systems, together with the energy generation from solar thermal power plants will, at the end of this century, contribute greatly to the total electricity supply (4). Like wind energy, which is currently in wide use around the world, photovoltaic systems are a fluctuating energy generator, and thus not constantly available. Energy can only be produced when the sun shines or the wind blows. Thus, plans to combine different renewable energy sources should be made in order to create comprehensive and consistent access to energy to meet global needs.

Base load capable combined heat and power stations using regional geothermal energy or locally

available sustainable biomass from forestry and residues would be sufficient. In addition, the base load can be fed by the traditional but irregular power supply from water. The need for regulation of the power supply will become more relevant with the growing influence of solar and wind power. This may affect the security of supply. Local examples of a fundamental change in energy supply, such as Starnberg in Germany, show that a regionalisation of power supply leads way from a centralised to decentralised structure. Then, it is the question of combining the decentralised power plants to a "virtual power station" that is capable of creating a secure supply system for an entire region (5).

The resource distribution conflict for the fossil fuels is becoming ever more acute as China and other developing countries join the fray. Future or current resource wars (such as Iraq) create huge suffering and costs. Instead, the same money should be used to expanded programmes for global sustainable and renewable energy supply – a far more meaningful purpose.

Karin Wurzbacher,
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Sources:

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- (2) www.landkreis.starnberg.de/energiewende
- (3) Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, *Renewable energy sources in figures – national and international development*, Status: June 2007, www.bmu.de/files/english/renewable_energy/download
- (4) German Advisory Council on Global Change, *World in Transition – Towards Sustainable Energy Systems*, 2003, www.wbgu.de/wbgu_jg2003_kurz_engl.html
- (5) Arnd U., v.Roon S., Wagner U., *Virtuelle Kraftwerke*, BWK Bd. 58 (2006) 6: 52-56

picture 1:
Kyrgyz women construct
a solar heater
source NGO BIOM, Kyrgyzstan

picture 2:
Kyrgyz Men learn about
solar cookers
source NGO BIOM, Kyrgyzstan

picture 3:
infrared picture - showing the heat losses of a
department building in Odessa, Ukraine, huge
potential for energy efficiency
source NGO MAMA86 Odessa, Ukraine

