
Renewable Energies

The solution for climate change and security of energy
supply

A Political Perspective on CSP

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Ladies and Gentlemen,

Thank you very much for the invitation. This conference is especially important in the context of efforts to protect the global climate and the environment, but also in its potential impact on

the quest for a new energy system which could function independently of diminishing crude oil and other conventional resources.

Ladies and Gentlemen,

One world summit follows on the heel of the other. No matter if G8 Summit, European Council, World Climate Conference, East Asia Summit and others – the energy issue has always been in the centre of attention in the past years. To be more precise: The focus is on climate protection on the one hand and energy security on the other hand. But till now, no summit has produced any real solution. Protecting the climate by reducing emissions has been the aim. But it has not been achieved yet. At the same time, strategists have regarded the development of crude oil, natural gas and hard coal resources as key measures to ensure energy security. What they have overlooked is that a strategy like this is inconsistent with effective climate protection. There is one solution for both climate protection and energy

security challenges: the switch to renewable energies – completely, worldwide and within a few decades.

The need to replace mineral oil, natural gas, coal and uranium with renewable resources is becoming more and more obvious, although many oil corporations steadfastly maintain that no supply shortages will occur in the coming decades.

However, scientific studies, such as those from the Energy Watch Group (EWG) paint a worrying picture. Current studies conclude that global oil extraction passed its peak in 2006.

(Slide 2: EWG forecasts)

In the coming years, oil extraction will decline by around 3% annually. This will mean that in 2030 only around 50% of today's level of 81 million barrels per day will be produced. The International Energy Agency (IEA) in Paris is no longer capable of producing accurate oil forecasts. It claims in its World Energy Outlook (WEO) 2006 that oil extraction could increase by 30% by 2030.

(Slide 3 world oil prices and IEA price forecasts)

The IEA's long-standing inability to estimate the world's resources accurately is shown by its oil price forecasts, which have for years proven to be inaccurate. For example, as recently as its World Energy Outlook of 2004, the IEA predicted a long-term oil price of under 30 dollars per barrel in 2030. Just a few weeks ago, in November 2007, as the oil price soared to almost 100 dollars, the IEA's WEO 2007 was predicting a rapid drop in the price of oil in the short term, and a price of just 62 dollars per barrel in the long term – a forecast which can be considered more than far-fetched. And yet almost all governments and companies continue to believe these incorrect forecasts.

Ladies and Gentlemen,

The IEA has in recent years completely failed to accurately assess the situation for fossil-fuel resources. The time has come for you all to recognize this, and above all to recognize that fossil fuels and nuclear power will no longer be able to meet the world's energy demand in the coming years. Those who today continue to refuse to invest heavily in renewables

and energy savings will cause a serious global economic crisis, in which they will also suffer in economic terms.

Just as the global oil supply is beginning to run dry, so it is inevitable that the natural gas supply will follow soon. Natural gas is a limited resource which cannot replace oil-based energy production.

Coal-based energy production, however, as the most environmentally hazardous, should be abandoned as quickly as possible.

(Slide 4 Coal production in the coming years)

The common assumption that coal will be readily available for the next 200 years is false. The Energy Watch Group has verified that within the next few decades there will already be shortfalls in coal supply.

Finally, uranium is the most limited resource of all.

(Slide 5 Uranium peak)

A report from the Energy Watch Group

(www.energywatchgroup.org) shows that in the next few years there will already be shortages in the supply of uranium required by the 439 reactors which currently exist worldwide. Atomic energy meets only 2.2% of the world's energy demand.

Atomic energy will therefore never be able to compete with fossil fuel energy or renewable resources.

Let's have a look at South Africa. For years, this country has been pursuing an energy policy focused on nuclear and coal energy. Recently, national emergency has been declared because power blackouts had occurred regularly. This is, above all, due to worldwide coal shortages.

Ladies and Gentlemen,

Today we are already witnessing the first climatic disasters as a consequence of a rise in global temperatures of only 0.8°C. *The atmosphere is already overloaded with climate gases,*

particularly with carbon dioxide. Any further emissions will bring about an additional increase in the Earth's temperature.

(Slide 6: Climate problems can be solved only by two strategies)

Climate protection must no longer simply imply the reduction of emissions, because this would mean further increases in the concentration of dangerous greenhouse gases in the atmosphere. Climate protection must now mean stopping the emission of greenhouse gases entirely.

(Slide 7: Climate-protection policies)

Climate protection can only be achieved through a clear, consistent and uncompromising policy for renewable energy resources. In particular, this means: feed-in tariff laws and tax exemption for renewables; an end to subsidies for fossil and atomic energy; campaigns for research, development and education in renewable energy resources; and an end to legal resistance during the approval process.

But, Ladies and Gentlemen, can we actually afford to abandon the use of crude oil, natural gas, coal and uranium?

There is a clear answer to this question. Precisely because the global economy is so fundamentally dependent on fossil resources, it must develop another resource base very quickly. Otherwise, the increasing depletion of oil resources, the drastic rise in oil prices and the simultaneous exacerbation of the global environmental crisis will precipitate an unprecedented worldwide economic crisis.

It is possible to make a fast total switch away from crude oil, natural gas, coal and uranium.

(Slide 8: Supply of renewable energy; slide provided by the German Solar Power Research Association (FVS))

The natural supply of renewable sources of energy – solar, wind, hydroelectric and geothermal power, bio-energy and ocean energies – offer many thousand times' the world's entire annual energy requirement. Enough solar radiation, in

particular, reaches the Earth to meet today world's energy demand 15 000 times over.

(Slide 9: CSP potential vs. electricity demand)

If only one percent of the surface of Sahara desert was covered with solar power plants, this would suffice to supply the whole world population with energy.

(Slide 10: Solar energy vs. CO2 savings)

Each year, solar radiation on one square metre provides us with as much power as we could draw from 100 or 200 litres of crude oil.

(Slide : 11 Solar Catalonia)

Several studies have long since shown that entire regions could meet their own energy demand with self-produced electricity from renewable energy sources. For example, recently a study by the research institute ISUSI has been published. It gives

evidence that the power supply of Catalonia could be based exclusively on renewable energy sources by 2040.

(Slide 12 Solar catalonia areas)

To achieve a goal like this, areas of a significant size will be needed, but they are existent in this case. So the land won't be under too great a strain, and the development of renewable energy sources is not inconsistent with protection of the countryside.

(Slide 13 Solar Catalonia cost per capita)

The conclusions of the study with regard to the costs are particularly interesting. Mere 100 euros per capita will be necessary annually to switch the electricity supply in Catalonia entirely to renewable energy sources.

Ladies and Gentlemen

It is possible to achieve this goal. We shall come to produce our electricity from renewable energy sources within a few decades. But there is one thing that is necessary, namely active political support.

In the electricity sector, the German and Spanish Renewable Energy Sources Acts are among the most important and most successful laws in the world for promoting renewable energies. The growth rates achieved by Germany, Spain and other countries are very high, and there has been rapid industrialisation of renewables, especially of wind energy and photovoltaics.

(Slide 14: Growth rate of renewable electricity in Germany)

In 2000, the Members of the German Parliament set a target in the Renewable Energy Sources Act for 12.5% of electricity to come from renewable sources by 2010. We were told that this target was unrealistic and unachievable. And yet at the end of 2007 a 14% share has already been achieved. This shows that renewables can grow much faster than is often assumed. What is crucial is the political framework, such as feed-in tariffs.

Renewable electricity is increasing at such a rate that worldwide energy demand could be met by renewables within a few decades.

(Slide 15 Job engine renewable energies)

Evidence for the development of renewable energies is given by the rapid increase of jobs in this industrial sector over the last few years. In 1998, only 30.000 persons were occupied in the renewable energies industry in Germany, just as many as in the nuclear industry. At the end of 2006, the number of persons occupied in the renewable energies sector had increased to 235.000. Experts expect that around 500.000 renewable energies jobs will be created until 2020.

(Slide 16 Concentrating Solar Power (CSP))

The technology of Concentrating Solar Power (CSP) offers a great opportunity to develop renewable energies here in Spain.

In the 1990ies, the progress in the development of

Concentrating Solar Power technology slowed down. As a

member of the German Parliament, I have been fighting for the

extension of financial support for research on Concentrating Solar Power systems since 1999. This gave German companies like Schott Solar the chance to further develop this technology. A particularly important decision was taken by the Spanish government when it introduced a feed-in tariff for CSP. This feed-in tariff triggered off the emergence of the market for electricity from Concentrating Solar Power systems.

(Slide 17: CSP plant with thermal storage)

But further technological innovations are necessary. Above all, the storage capacity of solar power plants must be improved in order to compensate for supply fluctuations in solar radiation.

(Slide 18: Solar Cooling)

Even solar cooling is possible with Concentrating Solar Power technology. See this example of a hotel in Turkey: Here the entire demand for air conditioning is met by solar energy.

(Slide 19: CSP cost forecast)

The cost of electricity from CSP systems is being reduced to an impressive degree. Experts expect production costs of 0,06

euros per kilowatt hour by 2020. This means that electricity from CSP systems will be competitive quite soon, taking into consideration the rapidly increasing costs of crude oil, natural gas and hard coal.

But the decisive factor for accelerating market development and reducing costs is the political framework. The most attractive framework is created by feed-in tariffs, which have proved to be remarkably effective measures for the promotion of renewable energies in Germany and Spain.

A look at laws in other countries reveals that the German feed-in law is the most successful instrument of all.

(Slide 20: Minimum Price System compared with Quota System, GB)

For instance, the United Kingdom has not reached Germany's level of installed wind capacity, despite the fact that it is windier in the UK than in Germany. In addition, the cost of a kilowatt-hour of electricity from wind power in the UK, at 13 cents, is almost twice as high as in Germany.

(Slide 21: PV Growth in Germany and Japan)

A comparison of the rates of growth in photovoltaics in Germany and Japan also provides convincing evidence that feed-in tariffs create more successful industrial policies than state subsidies or quotas and certificate laws. The initial successes of the photovoltaics industry in Japan have been far surpassed by Germany since the Renewable Energy Sources Act was passed. As a German parliamentarian who actively pushed for Germany's legislation on renewables and feed-in tariffs, I can only appeal to and call on the EU and national Parliamentarians: Please take any possible measures to achieve an improvement of the Commission's proposals in the European Parliament and the Council of the European Union during the coming months. The best solution would be to make feed-in tariffs obligatory for all member states of the European Union.

On January 23rd, the European Commission released a directive proposal on Renewable Energies. Unfortunately, this proposal doesn't provide any obligatory feed-in tariffs for the

entire European Union. I consider this as a great strategic mistake of the European Commission. Only feed-in tariffs could ensure a rapid expansion of electricity production from renewable energies in Europe. Instead, the European Commission has proposed a system of electronic guarantees of origin of green electricity. In my opinion, this measure is far too bureaucratic and might weaken the effects of the successful feed-in tariffs.

Therefore I make an appeal to all those who bear responsibility in Spanish politics and business: Please go on fighting for Europe-wide feed-in tariffs. The decisions will be taken soon in the European Parliament and the European Council. So the next few months are going to be decisive.

(Slide 22: Key components of a successful feed-in law)

A successful feed-in tariffs law needs to contain certain important details.

For example, the feed-in tariff must be paid for an extended period, at least 20 years. This provides the necessary security

for investment. The feed-in tariff must also be high enough for investment to be profitable.

(Slide 23: Linking the Mediterranean energy sources to a big renewables system grid)

The Concentrating Solar Power technology gives us the chance to create a Europe-wide network of electricity supply from renewable energy sources. With regard to solar radiation and surface availability, North Africa would be an excellent location of solar power plants. But if we want to extend the production of electricity from solar energy in North Africa, we need a comprehensive Mediterranean power grid network. The creation of such a network requires political support, above all on the level of the European Union. The Green Party member of the European Parliament, Claude Turmes, is the rapporteur for the Renewable Energy Directive. Last week, he declared in Brussels that he would work toward the inclusion of a Mediterranean power grid network in the European Union

directive. He will need strong support from governments and parliamentarians to achieve a success.

A Mediterranean power grid is in the interest of Spain.

Therefore I hope that many Spanish politicians will pronounce themselves in favour of the expansion of solar power plants in North Africa and a Mediterranean power grid network. With a joint effort, we can have these goals included in the European Union directive. The chances have never been as good as they are now.

(Slide 24: Solar Car (Twike) in front of Solar Park)

On this slide, you can see my solar car. The amount of electricity it consumes is rather small. It can be produced by solar parks like the one in the background, which is among the world's largest. I only need 10 square meters of PV on the roof of my home to enable my car to run 10.000 kilometres per year. What is necessary is to convert automobiles to emission-free drive systems powered by electricity from renewable energy

sources. Unfortunately, neither the European Commission nor the German Federal Government tackle this issue.

Ladies and Gentlemen,

An active climate protection policy, which at the same time ensures energy supply in the long term, makes a complete conversion to renewable energies indispensable.

Let's work together to provide even more support for all renewables on EU and national level.

Thank you very much for your attention.