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## Renewable Energies

The solution for climate protection and energy security

The Third Industrial Revolution:

The Economy for Climate Policy

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Ladies and Gentlemen,

Thank you very much for the invitation. This dialogue 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

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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

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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 84 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)

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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 2008. But today the oil price soared over 120 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

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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.

*I am fully aware that Australia as the world`s biggest coal exporter has a legitimate interest in further use of coal.*

*Therefore I respect the efforts to create carbon free coal fired power plants. Carbon capture and storage (CCS) is discussed*

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*as the solution. Also Germany supports that technology with high investments from public research funds. An extensive study regarding the possibilities of CCS was published in March by the independent scientific consultancy office of the German Bundestag (TAB). The key messages are : CCS creates a lot of scientific questions but no satisfying answers. Additionally electricity production with CCS requires about 40 % more coal. As we are already facing resource scarcity and enormously increasing world market prices today, coal fired power plants with CCS won't have a chance against renewable energies. CCS most likely won't be available until 2020. By then its chances are even worse. Renewable energies will generate electricity way cheaper than today and coal on the opposite will be far more expensive.*

*(Folie 5 Kohle preise)*

*The coal price rose rapidly during the last year and is a sure indication that the shortage of coal on the world market is indeed real.*

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Finally, uranium is the most limited resource of all.

(Slide 6 Uranium peak)

A report from the Energy Watch Group

([www.energywatchgroup.org](http://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

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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 8: oil gas coal are the main destroyers)

*About 80% of all CO2 emissions are connected to the use of fossile ressources like oil, gas and coal in the energy and chemical industry. Energy efficiency is extremely important to achieve climate protection. But efficiency alone is not enough. Fossile ressources have to be substituted by renewable ressources.*

(Slide 8: 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.



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*At the same time we have to develop strategies to extract carbon out of the atmosphere to store it in woods and in the ground as humus.*

(Slide 9: Climate-protection policies)

A Policy for Climate protection and Energy security 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.

*My doubts concerning emissions trading are growing however. In Germany it wasn't very successful until today. While laws for renewable energies saved more than 100 million tons of CO<sub>2</sub> annually, emissions trading contributed no significant amount with only 9 million tons. But emissions trading resulted in 5 to*

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*10 billion euro of unjustified additional profit for german energy companies.*

*(Slide 10: Renewables have Benefits, no Burden)*

*Basically renewable energies bring only advantages and no burden. They create jobs due to economic development and reduce prices for energy by creating an independence of rising fossile ressource prices. They bring a secure energy suply and abolish wars for oil.*

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.

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

(Slide 11: 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 12: CSP potential vs. electricity demand)

*If only one percent of the surface of Sahara desert was covered with solar power plants, the whole world population would be sufficiently supplied with electricity. In Australia there is a huge potential for solar electricity, both solarthermal and fotovoltaic, because there are gigantic desert areas.*

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Ladies and Gentlemen

It is possible to achieve the goal of 100% renewables worldwide. Several studies have long since shown that entire regions could meet their own energy demand with self-produced energy from renewable energy sources.

We shall come to produce our electricity, heating, cooling and transport fuels from renewable energy sources within a few decades.

*(Slide 13: Annual Investment in REN)*

*Renewable energies expanded rapidly during recent years. 70 billion US Dollar have been invested worldwide last year.*

But there is one thing that is necessary, namely active political support, to accelerate further development. The expansion is restricted to a few nations. Thus successful and efficient laws for renewables are necessary for all countries.

In the electricity sector, the German and Spanish Renewable Energy Sources Acts are among the most important and most

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

(Slide 15 Job engine renewable energies)

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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.

The most attractive political 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 16: Wind Power in G, 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-

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hour of electricity from wind power in the UK, at 13 cents, is almost twice as high as in Germany.

*You can see that Australia installed only a little amount of wind power as well.*

(Slide 17: PV Growth in Germany, Australia 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 Australian Parliamentarians: Please take any possible measures to achieve a similar feed in law in Australia.

*This will result in a great technological development in all sectors : wind power, solar energy, geothermal energy and especially marine energy. The energetic use of oceans is still to*

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*be made accessible. Australia could become market leader for wave, stream and tidal energy quite quickly with a good feed in law.*

(Slide 18: 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.

*A privileged grid access is decisive, to entitle investors to connect and feed into the grid.*

The introduction of the Renewable Energy Law in Germany has continued to be controversial. However, substantial counterarguments have been lacking.

All counterarguments are not sound. The initially high costs for renewables will fall in the coming years, thereby allowing them to be carried by the production economy. Similarly, the law



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does not concern subsidies, because tax funds are not at all involved. The entire financing of the Renewable Energy Law is through private capital, without public funds. Tax money is not involved. The state only specifies the framework for how investments in renewables are able to become economically profitable. The market alone covers the remainder. Thus no subsidies are paid for through the EEG.

Also the introduction costs for renewables are minimal. The additional costs for a typical household in Germany would be less than 2 Euros per month.

(Slide 19: Avoided cost)

*All in all the national economy in Germany has been relieved by renewable energies. While renewables accounted for 3,5 billion EURO additional costs per year, over 15 billion EURO could be saved due to reduced import of fossiles, avoided external environmental damage and lessened costs for emission certificates.*

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The big advantages of feed-in tariff of renewable energy resources, especially for wind, biogas, photovoltaic, hydro and geothermal, should lead to the introduction of this system all over the world .

Although the advantages of the feed-in tariff system for renewables are well-known, there are still resistances. The conventional fossil and atomic energy companies practise enormous background lobbying for their own interests and often against renewables.

The renewable energy act was introduced by greens and social democrats in Bundestag in 2000, against the votes of the conservatives.

It's a decisive step that now even the conservatives in the German Parliament accept the feed-in tariffs for electricity from renewable energies and consider them as indispensable. Some years ago, this couldn't be expected: During the national election campaign in 2005, the conservatives demanded the abolishment of the feed-in tariffs. But the extremely successful development of electricity production from renewable energies

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has come to be one of the driving forces behind the recent economic boom in Germany. This fact has convinced even the conservatives.

Ladies and Gentlemen

The heating and cooling sector is also very important for Renewables.

As far as heat supply is concerned, there is no development of renewable energies comparable to the electricity sector in Germany. For years, the development rate has been stagnating because a Renewable Heat Act is still missing in Germany.

(Slide 20: German Green Group: key components of a successful REN Heating Law)

The parliamentary group of the Green Party has made proposals for the framework of an effective Heat Energy Act.

The recommendations of the European Commission in January 2008 are suitable for a rapid development of renewable heat in the EU, *but not yet the german governmental prosal..*

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*A change towards renewables in the transport sector is also important and possible. There are two important ways : bio fuels and electric drives powered by green electricity.*

*Bio fuels got involved in a big discussion and are made responsible for rising food prices but that is wrong. The main reasons are the increasing oil price, bad harvests caused by climate change and the huge meat consumption. Land use for meat production is 5 to 10 times as intensive as land use for vegetarian nutrition. Nevertheless a sustainable cultivation for bio fuels is necessary. Disregarding social and ecological farming standards can indeed aggravate nutrition problems. Intensive land use often results in the degradation of soil. Organic farming however improves fertility, creates more humus and so even aids climate protection. Mixed cropping and Agroforestry are examples for ecological agriculture with ample harvests.*

*(Slide 21: Mixed cropping)*

*(Slide 22: Agroforestry)*

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*By the way, chemistry based on renewable resources is also very important for climate protection. Bio plastic solves a lot of difficulties like resource scarcity, climate change and waste problems.*

*Genetic engineering is no solution for such applications, because it creates further ecological problems. Genetic engineering is simply not necessary, neither for nutrition and bio fuels, nor for bio plastic.*

(Slide 16: 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 PV 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.

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The most important strategy to introduce REN into transport sector, is to convert the car producers from combustion machines to electricity cars, busses, cycles and others. But they must run only with renewable electricity.

*The transfer of knowledge as well as education are essential factors to meet the challenge of transforming our energy system.*

To facilitate the worldwide transfer of knowledge, it is imperative that an International Renewable Energy Agency (IRENA) be founded. This proposal, spearheaded by EUROSOLAR, has waited for a long time for political implementation, despite the many resolutions passed by legislatures and governments at the national and international level. I would appreciate, that Australia and other countries would join the foundation process of IRENA.

Ladies and Gentlemen,

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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. But we will earn also new jobs and a third industrial revolution.

Let's work together to provide even more support for all renewables and energy savings in Germany, EU, Australia, USA and other countries.

Thank you very much for your attention.