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THE FUTURE OF ENERGY: THE EUROPEAN AND AMERICAN APPROACHES— THE EUROPEAN APPROACH

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My name is Götz Reichert and I am head of the energy division of the Center for European Policy, an independent think tank based in Freiburg, Germany. We analyze proposals of the European Commission for new legislation, which has an impact on all twenty-seven Member States of the European Union. I am a lawyer by training, and four of my colleagues are economists. We work together in teams so that we have both the legal and economic perspective when we analyze new legislative proposals.

My aim for this presentation today, is to give you a broad overview of the diverse challenges the energy sector in Europe is confronted with today and the various policy approaches of the European Union in this respect. In order to illustrate the European perspective on energy policy, part one of my presentation will illustrate important challenges European countries have to face, and the respective role of the European Union in developing policy responses. The second part of my presentation will deal with the four major policy approaches in this field: the reduction of greenhouse gas emissions, the promotion of energy efficiency, the development of renewable sources of energy, and finally, the necessary adaptation of the energy infrastructure.

But before dealing with these four policy approaches, let me briefly outline the relevant regulatory setting in Europe. When talking about European energy policy, I am referring to the regulatory framework of the European Union. The European Union ("EU") is an international organization formed by twenty-seven Member States with over 500 million citizens. The EU ranges from Sweden and Finland in the north to the Mediterranean in the south, with countries like Spain, Italy, Malta, and Cyprus. You can imagine that these countries are quite diverse in several respects, not only with regard to their size and economic power, but also with regard to the natural preconditions for using different energy sources. For example, the island of Cyprus is totally dependent on the import of fossil fuels. Sweden, however, already has a comparatively high share of renewable energy, mostly water power. I would also like to mention my home country of Germany. You might have heard that Germany, after the accident at the nuclear power station of Fukushima, Japan, decided to phase out the use of nuclear power altogether. In contrast, our neighboring country

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France will continue to use nuclear power, covering more than 75% of its electricity production.[1]

Let me now turn to the overall policy framework of the EU, which applies to all of its Member States. If you think of the EU, you may think of it as a kind of federal system. Not all of my fellow lawyers in Europe would accept this notion, but practically that is the way it is. Due to the unique legal nature of the EU, its legislative measures have a defining impact on its Member States. One has to keep that in mind when talking about European policy in general, and for the last five years that has especially been true for energy policy. It is essential that the law created by the institutions of the EU is binding and enjoys primacy over the national energy law of the EU Member States. The EU can enact legislation on energy security, energy efficiency, and renewable energy. What remains to the exclusive legislative power of the EU Member States is the choice of their individual energy mix.

So let us have a look at the overall energy mix in Europe: more than 75% of the total gross inland energy consumption consists of fossil fuels like oil, natural gas, and coal. There is still a considerable amount of nuclear power in use (14%), and the share of renewable energy amounts to 10%.[2] The big issue in Europe, as opposed to the United States, is the dependency on energy imports. A conflict between Russia and the Ukraine, in January 2009, highlighted this dependency. The Ukraine is not a Member State of the EU, but the pipeline for gas imports from Russia to the EU runs through the country. Russia and the Ukraine could not agree on the conditions for the respective transfer fees. So what happened was that for about two weeks, gas imports from Russia were cut off, and some European countries experienced serious shortfalls in gas supplies in mid-winter. This really showed the dependency of Europe on energy imports. Now, the overall energy dependency of the EU is about 53.8% and it amounts to 84.9% for oil and 67.0% for gas.[3] If current trends continue, import levels of fossil fuels will reach more than 80% in the year 2035.[4] This is an unwanted scenario for a country dependent on oil from unstable regions of the Earth. Europeans have to realize that worldwide there are countries with a huge hunger for energy and that we are faced with rising competition for those resources.

Therefore, the EU has made the decision to "decarbonize" its energy system. The long-term objective is to reduce greenhouse gas emissions considerably. That is the trigger of the entire energy policy of the EU. We want to reduce our greenhouse gas emissions by 80%

1. EUROPEAN COMMISSION, EU ENERGY IN FIGURES—STATISTICAL POCKETBOOK 81 (2013).
2. *Id*. at 20.
3. *Id*. at 22.
4. EUROPEAN COMMISSION, ENERGY CHALLENGES AND POLICY 2 (2013).

to 95% below the level of 1990 by the year 2050.[5] To this end, the EU has set itself three headline targets: (1) until the year 2020, reduce greenhouse gas emissions by 20% as compared to 1990; (2) increase the share of renewable energy to 20%; and (3) increase energy savings to 20% through energy efficiency.[6]

Let us start with the first major approach: the reduction of greenhouse gas emissions. Five years ago, this was the big problem to be resolved in Europe, and the entire industrial policy of the EU was put under that headline target. The central instrument to achieve the reduction of greenhouse gas emissions is the so-called European Emission Trading System ("EU-ETS"). As still the biggest international emission trading system in the world, the EU-ETS comprises 11,000 heavy energy-using installations, power plants, and industrial plants in all twenty-seven Member States of the EU and also in some neighboring countries taking part in the EU-ETS. Furthermore, the EU-ETS also applies to the aviation sector covering flights from and to the EU. The EU-ETS works on a "cap-and-trade" principle, and the total volume of the greenhouse gas emissions that can be emitted by factories, power plants, and other installations covered by the system is limited and put under an EU-wide emission cap. Each year this cap is to be reduced by 1.74% to ensure that in the year 2020 we will have a reduction by 21% of greenhouse gas emissions as compared to the year 2005. If a company wants to emit greenhouse gases, it needs an allowance to do that. Each allowance gives a right to emit one ton of carbon dioxide ("CO_2"), the main greenhouse gas, or the equivalent amount of two more powerful greenhouse gases—nitrous oxide and perfluorocarbons. An allowance can be used only once, so companies have to surrender the used allowances for each ton of greenhouse gases they emit. If they do not, they have to pay heavy fines and this is enforced rigorously. There are different ways for companies to receive such allowances: some get their allowances for free. Companies can also buy additional allowances at auctions or from other companies. Emission allowances are the currency of the system. If you put a cap on the allowed emissions of greenhouse gases, you create an artificial market and the respective allowances get a monetary value. This creates a permanent incentive for companies to reduce their emissions. A company operating under the EU-ETS has various choices in order to reduce its emissions: it may decide to invest in more efficient technology or to shift to less carbon-intensive energy sources. This gives companies a chance to keep their allowances or to use them for future emissions. Or a company may sell its surplus allowances to another company who has made the decision not to cut emissions if the

5. European Commission, Communication COM 885: Energy Roadmap 2050 2 (2011).

6. Council of the European Union, Brussels European Council 8/9 March 2007—Conclusions of the Presidency of 2 May 2007 (2007).

company determines that emission reduction costs are too expensive. This flexibility of the trading system allows companies to choose the most cost-effective options to address their emissions. The hope is that reductions will occur where the costs for doing so are at the lowest.

We are just about to find out that there are several problems associated with this emission trading system. One of them is the risk of "carbon leakage." Carbon leakage may occur—if due to the costs caused by climate policies—businesses transfer production to other countries outside the EU, which have less stringent constraints on greenhouse gas emissions. Globally, this could lead to an increase in the overall amount of greenhouse gas emission: since climate change is a global problem, carbon leakage caused by measures to fight climate change is obviously counterproductive and also weakening the European economy. This problem was seen before, and companies in a competitive market worldwide receive allowances for free so that they would not leave Europe.

Another problem high on the agenda in Europe, is the growing surplus of emission allowances. This growing surplus has resulted in extremely low prices for emission allowances. There are several reasons for the growing surplus, one of them is that the system was set up before 2008. In 2008, the economic crisis hit Europe quite significantly, resulting in reduced production. Consequently, less greenhouse gases were emitted, and allowances were not used. Another reason for the surplus of allowances, is the growing success of the other two approaches to energy policy—raising energy efficiency and the share of renewable forms of energy. By being successful in these two fields, less fossil fuels are needed, which emits less greenhouse gases, resulting in less need for emission allowances. Therefore, the prices for emission allowances at the moment are extremely low. It is estimated that in order to give an incentive to develop low carbon technology and to force companies to reduce their greenhouse gas emissions, the price for emitting one ton of CO_2 needs to be at least €40 or $52. As of today, the price is as low as €2.75 or $3.60. Consequently, we have a big problem when it comes to this. Just a few days ago, there was a vote in the European Parliament about a proposal to take emission allowances temporarily out of the system in order to raise the price—the so-called "backloading" of allowances. However, the European Parliament did not accept this proposal. It was argued that artificially raising the price would be an inappropriate interference into the market mechanism, merely putting additional financial burdens on the European economy without any benefit to the overall goal of protecting the global climate.

Furthermore, I just want to mention some other measures for reducing greenhouse gas emissions which have already been taken. As I said before, there are 11,000 installations operating under the EU-

ETS. However, there are other sectors—transport, agriculture, housing, and so on—which are not covered by the system. Generally speaking, the whole policy on using greenhouse gas is targeted at using less fossil fuel. Therefore, there are close links to the other two policy areas—raising energy efficiency and the share of renewable energy—in order to decarbonize the European energy system. Already, the EU and its Member States have implemented a vast number of different legislative instruments in this respect. They cover different sectors like housing and transport, and there are basically two approaches in this respect: one is labeling, and the other is setting binding requirements.

Labeling is an instrument to raise the awareness of consumers about environmental impacts in general or energy efficiency in particular. It actually works pretty well with some of the household appliances. Also, there is an interesting legislative act dealing with the energy efficiency of buildings. It requires that in the future a building will need an energy certificate stating the energy requirement of a specific building. If you want to sell a house or rent it out, you will have to show it to the future buyer or tenant so that they know what they can expect with regard to the energy performance of the building. Another way of raising energy efficiency is defining efficiency requirements, for example on products—the so-called ecodesign approach. This approach basically forces manufacturers to fulfill certain energy efficiency requirements, and an example of such a result is conventional electric light bulbs, which were phased out in Europe and are no longer available. You have to use new energy saving light bulbs. More or less every product is in some way energy-related. So if you use very good insulating windows, they have an impact on the energy needs of a house.

The third major approach of European energy policy I want to deal with is the replacement of fossil fuels with renewable forms of energy like solar energy, wind, or water power. As I said before, European countries have different potentials for using renewable energy. Therefore, the EU-wide 20% target for using renewable energy is split. The targets vary between 10% for Malta and 49% for Sweden. EU Member States are free to decide which means they want to deploy in order to increase their share of renewable energy. During the last decade, Member States have developed quite diverse financial support schemes for the promotion of renewable energy: they use instruments such as investment aid, tax exemptions, and direct price support schemes including feed-in tariffs and premium payments. In Germany, for example, electricity from renewable sources is promoted in several ways: plants for the generation of electricity from renewable sources like windmills or solar panels enjoy priority access to the electricity grid. Therefore, those interested in feeding-in electricity to the grid may demand the grid operator to expand his grid and enable their

plants to be connected. Furthermore, grid operators are obliged to give priority to electricity from renewable sources when purchasing and transmitting electricity. The support system is based on a feed-in tariff, which the grid operator must pay to the plant operators. The amount of the feed-in tariff is set by law and is guaranteed to be paid over a period of twenty years. These are quite favorable conditions. If you go to the stock market, you cannot get a revenue like that. Therefore, it is anything but surprising that the German financial support scheme with its guaranteed return on investment has been very successful in raising the share of renewables within a short period of time. However, the system also causes a lot of problems. First of all, it is extremely expensive—raising energy prices considerably, especially for households. Furthermore, the priority access of electricity from renewable sources is already endangering the stability of the electricity grid: production peeks—flooding the grid with too much electricity from renewable sources—have become more frequent, posing a serious risk for blackouts. The plants generating renewable energy are geographically much more distributed and often located far away from cities and industrial centers. Therefore, they require new power lines to bring the electricity to the consumers. Finally, the wind does not always blow and the sun does not always shine. Renewable sources of energy are volatile, varying considerably throughout a day or a year. This requires backup-solutions like gas power stations or storage facilities. The need for new power lines, back-up solutions, and new storage facilities shows that the integration of electricity generated from renewables sources requires an expensive redesign of the entire electricity grid. These are the problems we are faced with, and we have not yet figured out how to bring all those policies together and especially how to adapt our energy infrastructure.

Europe must urgently invest in its outdated and poorly interconnected energy infrastructure in order to meet its energy and climate objectives by 2020. This concerns the entire energy infrastructure, comprising electricity, natural gas, and oil, and ranging from transportation lines over distribution networks to storage facilities. According to the estimates of the European Commission,[7] about one trillion Euros must be invested in the entire energy system by 2020 in order to meet the EU's energy and climate goals for 2020. About €600 billion will be required for energy networks—including distribution and transmission networks, storage facilities, and smart grids.

Securing energy supplies in Europe has proven to be a challenging and complex task. It comprises various approaches to decarbonize the European energy system, the most important of these approaches being reducing greenhouse gas emissions, promoting energy efficiency,

7. EUROPEAN COMMISSION, ENERGY INFRASTRUCTURE: PRIORITIES FOR 2020 AND BEYOND—A BLUEPRINT FOR AN INTEGRATED EUROPEAN ENERGY NETWORK 8 (2010).

developing renewable sources of energy, and adapting the energy infrastructure. I know that distinct differences exist between energy policies pursued in the European Union and the United States of America. Therefore, I welcome the opportunity to learn more about American energy policy today.

Thank you very much.

EU-27 Gross Inland Consumption 2011/Energy Mix (%)
Source: Eurostat April 2013