POLYGENERATION HELPS TO IMPROVE EUROPE'S ENERGY EFFICIENCY

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The European Union has an ambitious energy programme. Allow me therefore first to explain the EU's energy objectives. They may be well known to you but it may nevertheless be useful to read in between the lines.

There is an official consensus within the European Union's institutions – the Council, the Parliament and the Commission – to launch an ambitious energy efficiency programme, to boost the use of Renewables and to reduce our greenhouse gas emissions. The magic figure is 20% until 2020, i.e. 20% more efficiency, 20% Renewables in our energy portfolio, 20% less greenhouse gases.

The reasons for these objectives are manifold, although understandable. First of all, we have to take into account that our own energy resources are dwindling. In the future we will not only have less indigenous coal, we are also faced with less gas and oil resources in the North Sea. Denmark is the only EU-member state who is left as a net exporter of energy. Britain starts to import more than it exports. Therefore the European Union will become more and more dependent on energy imports, i.e. of fossil fuels. The consequences are obvious. We will have to pay more and more for imported energy. Because of the steadily growing oil and gas prices already today we Europeans have to pay more than 100 billion Euros more for imported energy than 2 years ago. And we become more and more dependent, in other words, we loose parts of our political margin of manoeuvre.

As we are in Spain I will give you an example of how an EU-member state can be put under pressure with energy.

In September 2007 the Algerian gas company SONATRACH which provides 60% of Spain's gas imports cancelled a big gas investment of the Spanish companies Repsol and Gas Natural in the east of Algeria although the two companies had already invested a sum of three digits into the project which will probably amount to 5,2 billion €. Algeria's adduced reasons are tax problems, costs and delays in the completion of the project. The real reason, although not officially outspoken, is probably the conflict with Morocco over the West-Sahara, a former Spanish colony. Algeria supports the independence of West-Sahara and backs the Polisario, a rebel movement fighting for the independence of Western Sahara from Morocco, whereas Spain favours Morocco's position to give Western Sahara full autonomy within an united Morocco, a position more and more supported by the international community.

I know that the Western Sahara problem is a delicate issue and therefore I don't want to go into the details. What I want to show is that energy becomes an instrument of extortion and blackmail. We know of similar examples in Eastern Europe where Russia used her gas policy to put pressure on one or the other neighbouring countries.

I do not know how Europe would behave if we were net exporters of energy and Algeria or Russia would depend on us. Our own colonial heritage does not give me much confidence. In the past we used our technical hegemony to suppress the weaker part of the world. Today some of these countries reply with the same method. So don't be too moralistic. But we have to take this behaviour into account as a matter of fact. Policy is what it is – it has to do with power. The less we are dependent on energy imports the freer we are to develop our own policy.

Another reason of Europe's new energy policy is our commitment to combat climate change. On various occasions the European institutions agreed to contain the foreseeable rise of the earth's temperature within 2 degrees. In order to achieve

this global objective we have to reduce our CO_2-emissions by 60% or 80% until 2050, according to the different assumptions. This is an enormous challenge and amounts to an industrial revolution in the strict sense of the term.

The more Renewables we use, the better our energy efficiency is, the nearer we come to this objective. This is as true as the law of gravity.

Having said that I would nevertheless like to add a few critical elements.

It is the usual habit of the European Union to announce objectives and then to miss them. We agreed on the so-called Maastricht criteria after introducing the Euro but when it became critical we used all tricks to avoid their application. The worst example were the Germans on whose initiative these criteria were created.

In 2000 we announced in Lisbon to become the most competitive and science based part of the world until 2010. In reality we Europeans are steadily falling behind the USA who we wanted to outperform.

And in Kyoto 1997 we promised to reduce our greenhouse gas emissions by 8% until 2010, starting from 1990 as our baseline. In the former EU-15 our CO_2-emissions are now 4% higher than in 1990. If we take all greenhouse gases together, we reduced our CO_2-equivalent by only 1%. In order to fulfil our objectives we therefore have to reduce our greenhouse gas emissions by 7% until 2010 or 2012 the latest.

So please, don't take announcements as reality. Dreams are necessary to motivate us but at the end we need concrete and measurable results.

The European Council, as we call the meeting of the Presidents and Heads of State, agreed in Heiligendamm and Brussels in 2007 upon even more ambitious goals, the already mentioned three 20%'s. Again, this is an announcement, not more. It has to be implemented.

The European Commission will soon present a directive to implement the 20% renewable energy target. The problem will be to give every member state an

obligatory share of renewables. I presume that several countries will insist on the inclusion of nuclear energy into these 20%. As nuclear does not emit CO_2 it must get the same consideration as renewables they may argue.

By the way, such a procedure would have enormous institutional consequences. For the first time, the European Union is willing to intervene in the national energy mix. This is particularly the case if the European Institutions, Parliament and Council, decide to give every member state a specific and obligatory quota for renewables. The term „obligatory“ means that the member state is fined in case it fails to meet the goal.

The Commission's task is not enviable. They have to find a compromise between three different models. The first one is based on the natural environment. The more it favours renewable energies the more you have to use it. In this case Eastern Europe because of biomass and the Mediterranean countries because of the sun would have to bear the lion's share. The second model is a proportional one. Every member state has to increase its share by 13%. Again the poorer countries would be penalized. The third model takes economic strength as a benchmark. In this case Germany would have to shoulder the burden.

I am not a prophet, far from that, but my gut feeling tells me that a conflict of interests is looming in the air. Such a conflict is not surprising and you should not be worried. The history of the European Union is full of conflicts and compromises. And at the end it is a history of success.

Such a compromise might not be in line with the resolution of the European Council. Again, this is not a catastrophe. Don't forget, the European Council unanimously agreed on the European Constitution, some years ago. Today the Presidents and Heads of State are no longer interested in their former decision and look for a new compromise formula. So take the decisions for what they are – important, but not always decisive. Flexibility may not be a constituent part of physics, but it is part of the political art.

Now let me come closer to the subject of your conference.

Our energy system so far is relatively simple. In your house you have several sockets and if you need electricity to light, heat or if you want to use your vacuum cleaner you switch the electricity on. In hot summers you use your electrical air conditioner to cool your office or your home. In the case of gas we rely on a similar centralized system. Gas is safely delivered to our gas kitchener or our heating plant. At the end of the month you pay your bill. If you have a technical problem you phone your electricity or gas company and normally you get a good service.

This centralized system of power supply has its advantages. It provides you safely with electricity or gas. Since the first of July 2007 the citizens of the European Union have even the choice between different electricity and gas suppliers.

So far, so good. But what is wrong?

From an efficiency point of view it is not the best of all worlds because the production of power and heat are normally separated. We therefore waste energy. The reason why we do it is the price. It was and sometimes is still cheaper to produce electricity and heat – or coldness - separately. But we could use and produce heat and power at a much more efficient way if we combined them. We would save CO_2 emissions and with higher oil and gas prices, with prices put on CO_2 emissions this technology will become even more economic. That is the moment you come in with polygeneration.

We could also heat or cool our buildings by better architecture and by using solar energy. We could reduce our energy consumption by better insulation. Energy from renewable sources could be fed in to our existing grid. New technologies could improve the efficiency of energy conversion.

A good example is the sterling motor. If I am well informed today small sterling motors for households are available, fed by gas, which produce heat and electricity for your home or your flat. Their overall efficiency is much bigger than the conventional system.

Another example are microgrids. Microgrids can provide network support in times of stress by relieving congestion and in aiding restoration after faults. From a utility point of view, the wide application of distributed energy sources close to energy loads can potentially reduce the demand for distribution and transmission facilities. On the other hand, micro-combined heat and power and photovoltaic systems at customer premises offer the opportunity to increase the efficiency of utilising primary energy sources.

The efficient integration of microgrids into low-voltage systems will enable electricity generated by renewable energy sources to substitute electricity supplied currently by hydrocarbon-based or nuclear plants with significant environmental gains. Besides providing ancillary services to the central electricity network, small scale distributed generation has the unique ability of tailoring power supply to match the customers' needs, thus enhancing the supply's quality.

There are a lot of other examples which you know much better than I do and which are the subjects of your conference. We know that we are able to improve our energy efficiency considerably.

Nevertheless, one of the problems is the difference between invention and innovation. We sometimes know that a solution is available in principle. But in reality there are still practicable handicaps. Take solar cooling – or solar assisted air conditioning - as an example. We know that it works and some of you are even among the pioneers of this technology. And we know that it is a technology of the future particularly in hot countries because you need it exactly then when the sun is shining at its maximum. But it is not yet economic and there are still some technical difficulties. Cost for the used heat plays a central role. Solar heat is still more expensive than heat produced by fossil fuel or waste heat.

We therefore need research and development to transform an invention into an innovation, i.e. to bring technology closer to the market.

The European Union has enormously increased her budget for Research and Development. When I became a member of the European Parliament for the first time in 1979 we had a yearly research budget of roughly 100 million €. Today our yearly budget is of the order of magnitude of more than 7000 million €. I have to admit that nowadays we are 27 member states. In 1979 we were only 9 member states. Nevertheless, the history of the last 25 or 30 years shows that we learned our lesson. Research policy, not agricultural policy is our future. And future has got a name: curiosity.

Most member states have increased their research efforts. The Scandinavian countries are the best of our class. Others are following. But we still have to do more. There are still many if not most member states lagging behind our objectives. We need more public money for research. But also industry must increase her share of research.

Nevertheless, Europe is not bad. We have an enormous potential and we also achieved a lot.

Let me come to the end and touch again our main topic which is – as I said earlier - efficiency.

We know that the basic laws of physics allow us to reduce the consumption of raw materials considerably without reducing our wealth. On the contrary, by using raw materials intelligently we increase our safety and our comfort. To consume less raw materials does not necessarily reduce our well being.

Although America is the only country to have an article in the constitution which asks for the pursuit of happiness, I am absolutely sure that you need not as much energy as the Americans to be happy. And my own experience tells me that we Europeans are not less happier than the Americans because we consume less energy.

The main reason why we Europeans – and by the way the Japanese – consume less energy per produced gross national product is the price of energy. We

have higher energy prices than they have. And higher energy prices trigger technologies which use less energy.

When the energy prices were high in the 70s and the 80s, we saved much more energy than after the rapid fall of the oil price after 1985. If something is expensive you try to save it or to replace it. We might soon be in a similar situation when the oil price will reach the range of 100 US $ per barrel or more. And the more we save oil the less we will have to pay. Energy saving is like printing money.

My personal advice to the next generation of politicians is therefore to be courageous and tell people the truth: there will be no successful energy efficiency programme with low energy prices. I know that such a message does not necessarily guarantee you to win the next general election. But it is the truth. And at the end truth will prevail.

I do not overlook that there are two main problems with high energy prices. The poor part of our population cannot afford them. Nor can our energy intensive steel or cement industry survive with high prices. We therefore have to develop social programmes, subsidies, exceptions and before all – new technologies. We also need a combination of social and technical innovation.

We will not succeed if the poor part of the society has to bear the burden. But in a longer run energy efficiency makes life easier. The more you save energy the more you save money. Therefore new technologies are like harbingers of a new social era.

I wish your meeting all the success it deserves. I also hope that polygeneration wins more friends, that you get the necessary public and private support and that we outsiders appreciate more what you are doing.