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THINKING THE UNTHINKABLE

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## KEYNOTE ADDRESS

### SECURITY AND ENERGY: SHORT-TERM IMPLICATIONS OF A LONG-TERM VIEW

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I am delighted to be the keynote speaker at this Repsol YPF–Harvard Seminar on Energy Policy because it gives me the opportunity to frame the discussion, *Thinking the Unthinkable*. I should point out, however, that I am not quite sure what it means to say “thinking the unthinkable.” Given the importance of the topic, I want to be sure we understand our terms. Does the term mean that we should consider very improbable, but significant, events that might occur? Or does the term mean that we should think of very horrible events that might occur? Perhaps it means dealing with both the improbable and the horrible. Therefore, in order to open the widest possible scope for discussion, I shall assume both possible meanings and give you a little of both the improbable and the horrible.

Specifically, I wish to offer you four unthinkable thoughts. They are unthinkable thoughts about oil, natural gas, terrorism, and finally, about carbon. I offer these four thoughts to stimulate discussion about new roads we may travel, as we navigate through the

unpredictable and dangerous waters of energy policy in a turbulent and dangerous world.

First, oil. We have witnessed a great deal of popular hysteria about the U.S. war in Iraq, whether in opposition to, or support for, the war. Today, attention is turning to the consequences of a long-term U.S. military presence in the Middle East. For my purpose the question can be phrased as “What significance does the presence of the U.S. military in the Middle East have for the future security of world oil supplies?” My first unthinkable thought is: it does not matter very much for oil supply whether the United States is present in militarily strong terms in the Middle East.

We should remember that the original energy security concern in the 1970s did not stem from the political circumstances in the Middle East, but rather from possible Soviet Union intervention in the region, and particularly the Soviet Union’s military intervention in Iran. More recently, we have been concerned about the conditions in certain states in the Middle East, whether they are secular states or religiously inclined states, that are not friendly to Europe or the United States, and about whether those countries will disrupt world oil supply. We frequently hear in the United States, for example, concern about what might happen if the Saudi royal family were to be replaced by a government hostile to Western values.

I suggest to you, as my first unthinkable thought, that the security of the supply of oil is not much influenced by such political change, and therefore the United States’ involvement in the Middle East region is not so important to the security of supply. The United States’ involvement may be very important, though, for other political reasons, e.g., assisting a peaceful solution to the Israeli-Palestinian conflict.

Why do I hold this view? Certainly the last 25 years of history would support my point. There has not been any politically-inspired price disruption arising from actions or attitudes of countries in the Middle East that are unfriendly to the United States. The basic reason is that economic necessity is a stronger force than political ideology. Eventually all these governments, regardless of their political

persuasions, will take their oil production to world markets and offer their oil on those markets. And moreover, since oil is fungible in world markets, every country will be able to purchase oil to meet its needs. To be sure, short-term supply interruptions will occur. There will be occasions when the price of oil moves up sharply because there is a perceived or an actual restriction of supply. But I claim that those short-term disruptions may be as likely prompted by economic speculation as by political change or turmoil in the Middle East. And, sooner or later, the oil will flow back to market, and stability in supply will be re-established.

So, my first unthinkable thought is that U.S. military presence or the threat of such presence in the region is not all that important in terms of ensuring the long-term secure supply of oil. To illustrate my point, let us reverse the political situation and imagine that every government in the Middle East magically would have what we would recognize as a democratic form of government based on a Western model, and that somebody like Ted Turner was the elected President of Syria or Dominique de Villepin was elected President of Iraq. Would we suddenly find a great change in world oil markets? Let me suggest to you that those individuals would remain eager to gain the maximum price for their oil in order to sponsor social and economic development in their countries. I do not think we would find a great difference in the trajectory of the price of oil. Short-term supply interruptions, however, might have a different character.

On balance, I say to you that we should have a continued concern with the Middle East, but we should not imagine that the U.S. military presence there is absolutely compelling in determining what happens to energy resources. Rather, what will happen in the Middle East is a consequence of the politics and the distribution of resources in the region. That does not mean we should not have concerns about political developments in the Middle East and elsewhere—it just means that oil should not drive our interests.

We should continue to encourage oil and natural gas exploration and production outside of OPEC and outside of the Middle East. There are welcome developments in supply both in the Caspian

region and in Russia. I have just returned from a trip to Russia where I saw the activities and the aspirations of the Russian oil industry to move Russian oil to market. The recently announced merger between Sibneft and Yukos is a welcome step in that regard. Russian oil in world oil markets helps to keep supply diverse. I do not believe that Russia will ever become the dominant oil producer; the production cost of Russian oil is too high. Therefore, Russia will be unable to gain dominance over Saudi Arabia or even Iraq in setting oil prices.

On the demand side, we should keep our eye on China. The Chinese appetite for oil is growing significantly, and this demand for oil will influence their foreign policy and the way they will try to establish their influence in East Asia and elsewhere in the world.

Let me turn to my second unthinkable thought, which is that natural gas inevitably will become a commodity traded on the world markets precisely the way oil is today. We are seeing in North America, in both Mexico and the United States, the prospect that great amounts of natural gas will be required to be imported from abroad. This means the United States will become an importer of natural gas, the way Europe and Japan are today. Stranded gas will find a way to market. Natural gas will be converted to liquids or liquefied natural gas (LNG) and sent to market, and chemical and fertilizer plants will move to be near the sources of supply. The implication is that the market clearing price of natural gas will no longer be what it costs to produce natural gas in east Texas or in the Gulf of Mexico. It will be the cost at the margin that has to be paid for landing natural gas, which is imported as LNG or in the form of liquid, from some part of the world where there are vast resources. In short, the price of natural gas will be dependent on a world market price rather than on local conditions.

How high might the price of natural gas become? That price might be in the range of \$4–\$6 per million cubic feet (Mcf). The actual amount depends on the netback that you assume at the producing wellhead. But somewhere in this range, LNG can profitably be landed in the United States, in Europe, or in the Far East. How high might the imported price of natural gas go? The backup price can only go as

high as what it costs to gasify coal and do carbon sequestration—this could be as high as \$9 per Mcf.

The point I want to make regarding my second unthinkable thought is that natural gas will be an internationally traded commodity like oil, and it will be the international price of natural gas that will clear the market in Mexico, in Canada, in Europe, in Japan, and in the United States.

My third unthinkable thought has to do with terrorism, and this is the horrible part of my talk. Since the events of September 11, 2001 and the time leading up to the war with Iraq, we have not experienced additional major catastrophic terrorist attacks. I find this quite surprising. The absence of any new major terrorist incidents appears to have led to indifference about terrorism. And indeed, some even make what I believe to be an illogical suggestion, that the result of the war in Iraq has made terrorist events less likely, rather than more likely or equally likely. I find this indifference to terrorism a very serious mistake. My third unthinkable thought is that we must consider and plan for additional acts of catastrophic terrorism against our countries, our people, and our companies.

There is no industry more vulnerable to terrorist attack than the international energy industry. To be sure, energy infrastructure has always been vulnerable. Refineries, pipelines, tankers, and the like are vulnerable to explosives. Energy infrastructure involving oil, natural gas, or electricity represents soft, fixed targets for attack. We see this, for example, in Colombia and also in Chechnya. It should be pointed out, however, that there are other possibilities for acts of terrorism against energy facilities. The first is that there are a few handfuls of organizations that are internationally organized, disciplined, well-financed, and capable of carrying out acts of cyberterror—the ability to disrupt or gain control of the communications and computer systems on which our infrastructure depends. Examples include government agencies, banks, power plants, and air traffic control systems. This is certainly a different kind of terrorism from what we knew 30 or 40 years ago, but today's energy activities and operations are tremendously vulnerable to this kind of information intrusion. I

consider the possibility of cyberterror to be a greater risk than episodic bombing of pipelines, compressor stations, and refineries because information intrusions can bring down an entire system for a considerable period of time. In sum, I believe that over the next several decades we will have to address the terrorist threat from the point of view of security of our energy operations. So the third unthinkable thought is, I regret to say, that terrorism must be on our agenda.

My final unthinkable thought has to do with carbon. I think it likely, but not certain, that carbon, and, of course, greenhouse gas emissions other than carbon dioxide, will become the single most important issue on the world energy agenda going forward. And this is because of the adverse climate effects, perceived and actual, from the largely irreversible warming that is occurring. There is no question that an impressive scientific consensus on global warming and climate change exists around the world. Continued expansion of greenhouse gas emissions and the increase of atmospheric concentrations to twice pre-industrial levels will likely have an adverse effect on climate. We are not sure of the timing or magnitude of these effects, but physics says they will happen.

We have no worldwide political agreement about how to deal with this problem. The Kyoto Protocol was not a helpful model for two reasons. First, it did not include developing countries, where the projected growth of energy consumption is much larger than in the developed world. Thus, the Kyoto Protocol offered no formula for including greenhouse gas emissions from developing countries. Secondly, the mechanism adopted in Kyoto, that of setting targets based on a 1990 base year, was problematic in two ways: the targets were too low if an atmospheric concentration of twice pre-industrial levels was to be avoided, and using targets is a far less efficient procedure than a carbon tax or a cap-and-trade system for constraining emissions.

Moreover, I suggest to you that there is a security dimension to global warming. Restricting carbon emissions will create new tensions between north and south, between developed and developing nations, that will preoccupy us on a political level in the years ahead. Penalties will be imposed on carbon emissions, and there will be arguments between the zealous countries, certainly Western



European countries, and laggard countries that are unwilling to constrain their emissions. These laggard countries will be developing countries, such as China, India, and Indonesia, that will be on a growth path. We should welcome that growth because of their need for economic and social development. However, these differences will give rise to political tensions around the world, and it will occupy the political agenda in a much greater way than it has in the past.

I was very pleased to hear Alfonso Cortina's remarks about searching for technology solutions to this issue because in the long run only technology will solve the carbon problem. We have only four choices: use energy more efficiently for the purposes we need; use renewable energy sources more widely, whether wind or photovoltaics; use coal gasification, combined with carbon sequestration; and use more nuclear power. All of these choices face difficulties, but in the long run, technology is the answer to the problem of reducing carbon emissions while permitting energy use to expand.

In sum, I have offered you today four unthinkable thoughts.

- First, U.S. military presence in the Middle East is not terribly important from the point of view of the long-term stability of world oil markets.
- Second, natural gas is going to become an international commodity like oil and the world natural gas price will become the market clearing price in importing countries.
- Third, we should not forget about terrorism. We must make plans to minimize the risk and consequences of terrorist acts.
- And the fourth relates to carbon. Carbon is no longer going to be a topic relegated to environmentalists and diplomats. Rather, it increasingly will become more central in the political and economic agenda of nations.

These are my unthinkable thoughts. I hope they stimulate discussion. They may not come to be true, but I want to say how excellent it is for a group like this to come together to discuss new ideas, however unthinkable they may appear.