PATRICK POUYANNE

Chairman of the Board and CEO, Total

Good evening.

First of all, I would like to say, dear Thierry, dear Ministers, dear Ambassadors, ladies and gentlemen, that I am very pleased to speak here in this magnificent setting in Marrakech in Morocco, to celebrate the 10th anniversary of the World Policy Conference that Thierry de Montbrial instituted, with the support of our company for several years, as Total has been a loyal partner since the outset. So I am truly delighted to speak to you this evening, for this 10th conference.

I had the opportunity to address this event two years ago in Montreux, and in preparing this speech I asked myself what had changed in two years in the world of energy. I was struck by all the things I was able to write down on a piece of paper, because in two years, from November 2015 to November 2017, many events have shaken the world of energy. In addition to the fact that the oil price has fallen -- at the time, it was probably around USD 65 -- to a low point below 30 dollars, before returning to 60 dollars per barrel again, reflecting extreme volatility. There was the Paris Ageement on the Climate, which came in December 2015, there was the Iranian nuclear deal, signed in January 2016, there was also the Vienna Agreement between Saudi Arabia, the OPEC and Russia in November 2016, which was an historic agreement to which I will return, and then there were other events, such as for instance, Donald Trump's election in the United States.

The world has changed a lot in two years' time. Two years is short a short time, but actually, you realise that in the world of energy, everything moves very quickly. Two years ago, when I spoke, I did not use the word "electric vehicle". Today, two years later, if I don't talk about it, you'll say: "*What a fuddy-duddy, all he thinks about is oil and gas, he doesn't even want to talk about new technologies.*"

In fact, this reflects that the world of energy is indeed changing, and changing very quickly. Why is this? Because in reality, and I will come back to this multiple times in this speech, energy is an absolutely fundamental good for the economic and social development of this planet. Wherever we are on the planet, men and women aspire first and foremost to have access to energy. Having access to energy, it seems a given in this setting, in this illuminated garden in Marrakesh, but we need to understand that today there are 1.3 billion people out of the 7 billion inhabitants on the planet who do not have access to energy.

The second fundamental trait of energy is that people want to have access to energy that is not expensive -- affordable energy. The price of energy, the cost of energy is at the heart of any economic and social development. Whether in developed countries, where you can clearly see that the populations are quick to rant and rail as soon as oil prices rise, or in emerging countries where people want to have access to this energy, which for them is synonymous with mobility and economic development, the price of energy is essential.

Then, there is a third dimension of energy that is new, the one enshrined in the Paris Agreement: mankind aspires to have energy that is clean, specifically for the climate i.e. that does not emit CO_2. Yet energy production and consumption is the source of 60% of CO_2 emissions. Herein lies the whole challenge, the challenge of a company like Total -- not only for Total, though, but for the entire energy world.

In this context, the expression "energy transition" has become fashionable. It is an expression that I don't like because I think that in fact we are not at all in a transition phase. The world of energy is constantly shifting. We need to keep in mind that three centuries ago, men used wood. Then they moved to coal. Then they moved to oil, gas, and then now solar and wind, always guided by this quest for abundant, cheap energy.

However, there is another observation to be made: coal, in this list, appeared almost two centuries ago and is often presented now as an energy of the past. Yet today, on this planet, the most consumed primary energy source is coal, it is coal that still accounts for 30% of the planet's primary energy consumption.

This is just to tell you that, in the world of energy, time is also experienced over the long term because, ultimately, while the world does aspire to the Energy Grail -- an infinite, inexpensive and clean energy source -- in the end, it is nonetheless trying to satisfy a fundamental need, and humans will need to use the cheapest energy available to them.

At this stage, I want to return to the world I know best, that of oil and gas. Some consider this to be a world of the past, but I can assure you that it is not old at all, and I can assure you that in fifty years' time, there will still be oil and gas in the planet's energy mix, just as there is still coal two hundred years later. Because there is a profound mistake that many people make, and which I see as cause for concern, because it can be the source of bad decisions, that of believing those who speak in overly Manichean, somewhat simplistic terms: "*All we have to do now is say goodbye to these fossil energies and replace them with new, renewable energies.*" This seems like a fine idea, but it does not address, given the current technologies, the primordial aspiration for economic and social development across mankind.

Oil and gas today account for about 50% of this planet's energy. If you add 30% coal, this means that fossil fuels "of the past" still account, in 2017, for 80% of the planet's energy. If I go through the description of the energy landscape, nuclear energy accounts for about 5%, hydropower 5%, and biomass 5%, but that is mainly wood energy which, in Africa and other emerging countries, many women use for cooking, a source of mortality and high carbon emissions. Moreover, renewable energy now accounts for 3% of the planet's energy.

Of course, all this will change, as we discussed, but the time-scale with energy extends over the long-term.

To come back to oil and gas, and I think that is also why I was invited to the World Policy Conference, when we talk about energy, because we are talking about a fundamental economic asset, it also entails dimensions of geopolitical nature.

I would first like to recall what I said two years ago, in fact: it is that oil and gas are two energies that are concentrated in very few countries. Around ten countries on this planet account for 80% of the oil and gas reserves. These countries, as you will well recall, are not "neutral". You listed their names over the course of the morning and will state them again tomorrow, and they of course include all the Middle East countries: Saudi Arabia, Qatar, United Arab Emirates, Iran, but also Russia and, of course, the United States with the revolution ushered in by unconventional hydrocarbons. To have listed those seven countries, is to have mentioned about 75% of the planet's oil and gas reserves. To that list, you have to add Venezuela for oil, and Turkmenistan for gas to reach 80%. You will have noted that the countries I just listed are all countries that are central to all the major questions in world geopolitics today. The Middle East, of course, as well as Russia and the United States.

Two other countries that we must not forget when we talk about energy are China now and India in the very near future, because they are the largest consumer countries. China today has become the largest oil-consuming country and even the largest oil-importing country, with nearly 15% of the world's oil now consumed by China. And this is a factor that of course needs to be taken into account.

I mentioned in the introduction two recent agreements that have implications which I consider to be major, which shift the lines. The first agreement was the nuclear agreement with Iran. Because Iran is the country with the world's largest gas reserves and the world's fourth largest oil reserves. So it is not without meaning to see Iran return to the concert of nations in a way, even subject to conditions. It is a major country in which, moreover, Total Group has decided to be bold enough to sign a contract to produce domestic gas and be the world's largest oil and gas group to invest.

The second agreement I would term historical is the Vienna Agreement reached in November 2016 between Saudi Arabia and Russia. I should say the agreement "between OPEC and non-OPEC countries" but, fundamentally, it is

Saudi Arabia and Russia that came to the agreement. This is an historic agreement because it is the first time in the history of oil that Russia is agreeing to cut back its production as a means of contributing to price control. Russia and Saudi Arabia combined account for 20-25% of world-wide production.

Obviously, this is a major event through the geopolitical alliance it implies. King Salman's recent visit to Russia, the first visit by an Arabian King to Moscow, lies at the root of this understanding. Because these two producing countries, namely Saudi Arabia and Russia, prefer it when oil prices are above USD 60, rather than USD 40, as was the case last year. For these countries and many other producing countries – and there are, without a doubt, representatives of these countries in the room – oil price is a fundamental issue and is once again the source of their economic and social development.

This oil price, as I said, is very volatile. In fact, what is happening is quite simple, it is what we learn at school. When the price is high, as was the case from 2005 to 2014 when oil prices remained at 100 dollars per barrel, there are two impacts. The first is that everyone wants to invest in oil. It becomes the new Eldorado. And when everyone invests, supply increases and becomes very high -- too high. Too much production is put on the market.

Then, there is a second effect: when the price is high, demand fades. Demand drops because energy is too expensive, as I was explaining in the first part of my speech. What needs to be understood is that this period, from 2005-2015, where the price has been very high, is at the root of the technological innovations that are currently shaking up the energy world. We would not be talking today about solar or wind power the way we are if the oil price had not been at USD 100 for ten years, but had remained at USD/b 10/30 as it was in the 15 previous years.

This high price per barrel has opened up a whole new realm of technological possibilities, which companies have eagerly embraced, thinking: "*At this price, solar energy is profitable.*" Initially, we had the impression that it would take USD 100 for solar to be profitable. But as the investment driver is strong, we have been able to rapidly improve technologies and today we are saying: "*Solar is profitable even at USD 50 per barrel.*"

It is therefore the high price that generated these technological innovations. As did the discovery of unconventional oil and gas. The amazing revolution now being experienced by the US, which is a country blessed in terms of natural resources, stems from oil price. It is because we had USD 100 per barrel that US oil and gas companies started to look for oil in these rock formations with extremely low permeability, known as unconventional oil or unconventional gas, shale oil and shale gas. It is because, initially, in order to be able to make such an operation profitable, it was thought that the equivalent of USD 100 was needed. However, as we have started to find, the companies in question have improved, and today it is cost-effective at USD 50 – or, where gas is concerned, even USD 30.

This is, moreover, something quite surprising, as this engine must make us optimistic about our ability to achieve the objectives of the Paris Agreement. People say: "*Two degrees is not possible.*" It is not possible because today, we look at our world with the techniques we currently know. It is hard to imagine what future technologies will be, but if we look at the past fifteen years, and I can attest to this because I have been in oil for twenty years, the world has changed profoundly, the techniques are changing, and this has to make us optimistic about our ability to meet these challenges.

So, what lies ahead? If we want to look at what energy will be like in 2040, if we keep to this two-degree trajectory that the Paris Agreement requires, the International Energy Agency (our bible at Total) first tells us something that many people are forgetting: in 25 years, there will not be 7 billion of us, there will be 9 billion, and these 9 billion inhabitants will have to be able to consume only 10% more energy than the 7 billion today. And let me remind you that, out of those 7 billion, 1.5 billion do not have access to energy.

The first huge effort we thus need to make collectively is an effort to save energy and achieve energy efficiency. We need to avoid consuming energy. This is absolutely fundamental, because the natural trend from 5.5 billion to 9 billion, with technologies that consume more energy, is more like an increase of 30 to 40%. So there is this first imperative: saving energy, which is, moreover, a potential source of jobs and business.

By 2040, there will still be oil and gas: between 40% and 45%. You see: Total will still be an oil and gas major. On the other hand, if we want to achieve the two-degree target, there would have to be much less coal, which is not at all an easy goal. We will need to have less than 15% coal. Why is this not easy? Because there are many people on this planet, and because it is the cheapest source of energy. India has only one natural fossil energy source, and that is coal. China has a lot of coal. South Africa does too. And when you say to these countries: ''*You have to avoid using your natural resources because of climate change*'', which I tried to do a short while ago with the Indian Minister of Electricity, he responded in a very common sense manner: ''*We are historically responsible for only 2% of CO_2 emissions on this planet -- so why do you want us to be the ones to slow down our economic development?*''

This is an absolutely fundamental issue, which is anything but easy to deal with because, once again, every State wants to build an energy mix that will yield the cheapest possible energy.

And then, beyond the oil, coal and gas mix, there will be renewable energies that will account for reach 30% of this energy mix in 2023, with extremely strong growth. This explains why Total has positioned itself on this market and is now investing in solar, but also in the production of electricity from wind and renewables.

There are two other technologies that will be fundamental if we want to reach the two degrees in the Paris Agreement. The first is energy storage. Storing energy is extremely complicated. There are probably many engineers in this room. Electrons are things that do not like to be stored, not at all, and it is very complicated to do so. We are making progress, but are doing so slowly.

It would be wrong to think that we have already uncovered all our possibilities, as some people believe, because storing energy is fundamental when we talk about renewable energies. In Morocco, moreover, you have large-scale solar farm projects; however, if you build 100 megawatts in solar farms, you will use between 15% and 20% of them today. Why? Firstly, because it is dark for a certain part of the day, and secondly because your network is unable to absorb the maximum sun levels. There is very high inefficiency.

If we are able to combine the solar farm with batteries, and with efficient energy storage, the 15 to 20% will relatively quickly become 50% or even more. And by then, there will be energy systems that will be sustainable and can meet demand. Once again, if I tell you that you can have electricity only when there is wind or there is sun, you will not be happy.

It is for this reason that we all need to be clear, and that we not pit all these energies against each other, and that we will still need gas and oil, because we will still have to ensure the continuity of energy and electricity supply.

The question of energy storage brings me back to the electric vehicle that today appears to be the new Grail. We, at Total, just published a scenario, probably the most aggressive scenario ever put forward, where we imagined that by 2040, 50% of all new vehicles will be electric. This implies an impact of 8 million barrels per day in demand, which you need to see in perspective with the current demand, which is approximately 100 Mb/d. The electric vehicle is an extremely important subject and I profoundly believe that it will develop in particular in cities, but that its impact on oil consumption will remain limited. The electric vehicle does not imply the disappearance of oil.

Why? Because there are other uses for oil. You need oil to make industry run, to drive lorries, to fly planes, to produce petrochemicals and plastics. There are many uses other than individual land transport. So these technologies are improving quickly, but it would be wrong to conclude that they mean the end of all these fossil energies, because once again, for many uses, we need energy.

And then the other key technology to be developed if we want to limit the temperature increase to less than two degrees, alongside the storage of energy, is the capture–storage–transformation of the CO2 that we will be emitting when we continue to use fossil energies because we will need it. We will need to be able to capture it, and to transform it into materials like cement, or to store it. This is another major technology on which groups like ours are engaging.

In conclusion, energy is at the heart of the key issues in the economic and social development of mankind, and we would be wrong to look at this only through our eyes as Western developed countries. I am always struck when I come

back to Paris, after spending time in countries of Southeast Asia, by the gaping divide in perception on these issues: on the one side, you have countries where, fundamentally, the people and governments are striving to gain access to energy just to develop and raise their standard of living, and our countries, which are already in an era of clean energy - though I should remind you that our consumers, as soon as things start to cost more, are quick to show their discontent.

This is a complex subject that will also entail changes in behaviour, but it would be wrong to think that, in the West, we are here to educate the rest of the planet on this subject. We must also shoulder our share of responsibility.

That is all I had to say. Thank you and I am at your disposal.