



CHRISTOPHE DE MARGERIE

Chairman and CEO of Total

The second part concerns the importance of non-conventional oil and gas and the development of renewables, which are the two new elements. Renewables are definitely new, but the importance of non-conventional is tantamount to a revolution, both for gas and now for oil. Regarding figures, we consider that 30% of all recoverable resources could come from unconventional oil. This 30% is probably at the low range, but we are certainly not as advanced in oil as we are in gas, especially in countries which already have a lot of traditional or conventional oil resources.

Never forget that in our terminology we use 'resources' to mean something which exists, but might not yet be usable because of technical or economic issues, which are linked, and they only become reserves when through technology and economics they can be used, so today we are talking about resources. Using the same figure for gas, the 30% becomes 50%; 50% of the full amount of gas resources might be coming from non-conventional, which is probably not totally assured, especially in countries like Russia, where they are not as willing to develop shale gas, at least up to now, because this would compete with their huge existing reserves of gas. Do not open a debate before it happens, but the figure is huge.

Regarding renewables, the only thing we can say at this time is that we need them, and for the chairman of an oil and gas company, which we call an energy company, to say this is a proof of our real commitment. However, regarding the use of oil, at the same time we have to be careful of inconsistency, because sometimes people say things that they know are probably wrong or undoable, but they still do it. That is part of what I call the unnecessary antagonism, which is still there, we do not know why, but which has to be changed.

However, what we can say is that, even in fighting to make those new renewables economical, they are still not, they still need what we call subsidies, or, if we want to be nice, help, but even when people are talking about stopping subsidies, they are not. For example, in Germany they said they would stop subsidies, but for access to the grid you do not pay anything; that is a subsidy. However, sometimes the people in charge, not always to place the blame on politicians, know they cannot say 'subsidies', so they are doing it without saying it.

We will have three presentations, one on environmental acceptability, one on energy and competitiveness, and one on the geopolitical consequences of the new energy at a global level. We will start with the presentation on the nonconventional developments, because a lot of things are said about this, and it needs to be addressed in a technical, not a political, way, so that we will know what we are discussing, because when you look at the past, what was nonconventional is now becoming conventional, and do not think that nonconventional will remain nonconventional forever. I have been in the industry for almost 40 years, and what was unconventional at that time is now conventional, meaning that the technology exists, the learning curve exists, the economics are there, so it can now be called conventional.

Do not look at how we produce shale gas; that is not the problem for today. Firstly, what we have is tight oil and tight gas. Tight gas is still separated from shale gas; tight oil is usually mixed with shale oil, especially in the US, because it is still difficult to tell the difference between the two. However, what we call tight gas is definitely natural gas, or natural oil, which are contained within classical reservoirs but with very low permeability, so it is difficult to produce. It is all conventional, but where it is not conventional in how it is produced, it is called nonconventional. That is the difference between shale gas and shale oil.

Then you have shale gas and shale oil, which are natural gas again, but this time trapped in the source rock, and that is why we need fracking, the famous word that some people do not like; maybe we should have used another one, like stimulus, but I have plenty of ideas, and Manoelle Lepoutre has even more. However, believe it or not, fracking has been used in our industry for more than 50 years; for instance, you need to frack to develop tight gas. It is not the same kind of fracking, and it is not as important, but both are fracking.



Then you have the famous coal-bed methane, which is not gas coming from coal but coming from areas where there is coal. That is what we are doing, for instance, in the new development in Australia, but it has been produced in the US for many years and represents an important part of the resources. It is definitely not as easy to produce, and there is a strong concern about water, but in that case it is not about using the water but what to do with the water you are producing at the same time, and the gas you in fact produced before.

Shale oil and oil shale are different, just to make things impossible to understand. That is something that is still not produced. We have pilots in the US, but they are very limited. There is a huge problem with acceptability, because it is going to be produced through mines. Simply put, it is not yet mature oil, and we want to produce it, but producing it is not easy. We need to make it liquid, which is not the case, so it is for the long term. There are plenty of resources of that sort, but these should be even more difficult to produce than the one in Athabasca in Canada. What we mean by unconventional excluding extra heavy oil is that we do not consider heavy oil to be unconventional anymore in Canada and some other countries, but for some people it still is for the problems it raises, especially in terms of the environment.

Our new perspectives on unconventional gas resources are changing the landscape we had not so long ago. North America is the first, with 27% of gas reserves, including unconventional, though the FSU has only 22% - it used to be the first, but at the same time we believe we are far from having a full understanding of what is really underground. The Middle East is now only at 25%, including Iran and the gas which is probably in Iraq and other countries, but still the shale gas is totally unknown, which is why I am very cautious about dates; it will certainly be different in a few years' time.

Asia : all depends on China, which accounts for only 17% of the world consumption, but represents altogether an additional 50% in the growth of the world production, and that is changing the geopolitics, not only for gas but, as we will see, for oil. Do not forget South America, even if today it still seems to be small; the 5%, which is still a huge increase, is today coming mainly from Argentina, but we do not think we have full understanding of this unconventional potential, because we think that here we have 50% of the worldwide resources. Therefore, in terms of gas production, conventional still represents the main part of what we call core production, but with a tendency to decline while the others are increasing. The thing is, when we talk about unconventional, it will take time; it is not that, while we are talking about an additional 50%, it can be produced in a few years' time. The time limit here is 2030, and we have to work on 2050 to at least compete, because when you look at shale gas production, there is a huge increase.

Looking at the evolution since 2009, we have to be modest. Regarding the impact of shale gas on North American energy, it is becoming a little technical here. It is not just changing at a global level, but also at a country level, and the relationship between Canada and the US is going to be especially interesting in the years to come; a big fight is coming, because the US is producing a lot, and Canada cannot export anymore, so you have all the problems of the HH price, the older problem of LNG capacities, what the US Government is doing, and whether the rest of the world is ready to count on additional LNG energy from the US or whether it will still be limited. It has a lot of impact on petrochemicals and power generation, including refining, so the picture of the North American environment and industry will be totally different in 7-10 years' time.

Going back to petrochemicals, what are we doing to do with all those new polymers which will probably come into France and the European countries? This has to be addressed if we are to understand it. We will probably need an additional one or two years to have a better understanding, but it is definitely hurting Athabasca production.

Regarding tight oil production forecasts for the United States, we are at 1.2 million barrels per day, and that is again a mix, because a lot of things are used. Here we use tight oil, shale oil, and what we call the NGLs; NGLs are what is coming from shale gas, so there is a mix of NGL from shale gas and tight oil, so when you see pure shale oil and tight oil figures, they are 0.9 million barrels per day, and when you have the NGLs, which are the liquids of gas, it is up to 1.2 million barrels per day. 1.2 seems to be little enough at that stage, and it is true that it has to be compared with the 90 million produced per day globally, but at the level of the US, it is enormous, and if I were bold enough to show you the forecast for the future, it will rise from 1.2 to probably 3 or maybe more; that has to be re-addressed.



The impact of tight oil in North America is on the technical and logistics side, and the American Government has recently announced that they are willing to go back to Brent as the main index, no longer WTI. The funny thing is that this is coming at a time when there will probably be a real gap between WTI and Brent; it is at least due to restart from scratch, and we will then see the impact on crude locally, and whether it will be as it is for gas, with a different price in the US and the international market. That is a question for you.

Regarding the challenge of unconventional for the industry, you know the subject; we have aquifer production, water management, footprint, and interaction with civil society. There is still a lot of work to be done, but it is already done, much more than people think, but people do not want to listen. We will continue to talk, people will have to listen, and we will have to stop being antagonists.

Therefore, in conclusion, we definitely have huge resources, and that is good news for the industry, and for customers and clients as well, because if we cannot just replace this with renewables, it is at least clear that there is energy available. This is even truer for North America and the impact on geopolitics, and this will definitely have an impact on nonconventional production, but also on global prices, and that is something we cannot yet predict. It is true that it has an impact on gas today and a very limited one on oil, as an extra million on top of 90 million, and what is happening in Iraq is much more important, because we have to be careful not to mix global geopolitical problems with those inside a country. Events in a country can have even more impact on global geopolitics, because it can really make a difference in US policy.