

## DEBATE

### **Nobuo TANAKA**

Before opening questions to the floor, let me ask one question of all the panellists. The question is this. Renewable energy may become mainstream, and certainly, the demand for fuel is moving away from fossil fuels, regardless of what Mr Trump is pushing. Demand for oil and demand for gas could decline, and the oil price could go from USD 80 per barrel to USD 8, for example. Just for the sake of our brainstorming or scenario analysis as such, the low price of oil will certainly impact on Iran, Saudi Arabia and the Middle East, Russia, and also the United States, for shale production. Does this kind of new world with renewable energy mean more peace in the Middle East or the other way around, more wars or battles because of the battle for diminishing returns or profit? What do you think, Olivier?

### **Olivier APPERT**

First, it is clear that the oil consumption will continue to increase. Your scenario may not happen before 40-50 years from now. I am afraid that in between, there will be many conflicts in the Middle East.

### **Leila BENALI**

For renewable energy to become mainstream, you will need something. These are intermittent technologies, so you will need a lot of gas, a lot of storage etc. as we mentioned, but I am willing to play the game. It depends on when that happens, so if you assume that it will be in 40-50 years' time, I am hoping a lot of these countries will have time to implement some of the reforms that they have engaged in.

However, here again, it is very difficult to put all these countries in the same basket. Tanaka-san, your presentation showed how the regions are evolving. The countries are becoming importers and exporters at the same time and are being exposed to oil and gas prices totally differently. I would not like to simplify it by giving just one statement, but for some countries, there will be an imperative to push to some reforms, more extensively than others.

### **Nobuo TANAKA**

Will Saudi Arabia survive with USD 8 worth of oil?

### **Leila BENALI**

When is this?

### **Nobuo TANAKA**

It is in 2030.

### **Leila BENALI**

Yes.

### **Nobuo TANAKA**

How about you, Dr Cooper?

### **Richard COOPER**



I am with Olivier. I do not want to play the game. If we can play that game, we can imagine we have a magic wand and just tiffilate what we want. That is science fiction, so I am not willing to play your game. Or you want to play that game, I am allowed to put in some other things as well.

**Nobuo TANAKA**

Like what?

**Richard COOPER**

A magic wand which you can point at the relevant countries to say, 'Keep peaceful'.

**Nobuo TANAKA**

It is a magic wand for peace. My exercise for this kind of volatility is this. Many countries are creating scenarios to prepare for situations of unpreparedness or for very volatile situations. Science fiction is true, but without thinking about these kinds of very unpredictable situations, we are in trouble.

**Richard COOPER**

We will be paying USD 35 a barrel rather than USD 8 a barrel.

**Nobuo TANAKA**

What do you think about the USD 30 a barrel that we have looked at so far?

**Richard COOPER**

Saudi Arabia will survive USD 35, with difficulty, but it will survive.

**Nobuo TANAKA**

35 is very easy for Saudi Arabia to achieve. Production costs are much cheaper.

**Richard COOPER**

Eight is impossible to imagine without a magic wand to go along with it.

**Nobuo TANAKA**

Let us see what the oil price will be in 2030. Who knows? This is a difficult thing, but we need to prepare for unpreparedness. Japan faced such a massive earthquake and crisis in nuclear. Preparing for unpreparedness is very important. Do you want to play the game, Masuda-san?

**Tatsuo MASUDA**

Yes. I may go along with what you said by sharing an episode. When I was a director of the IEA in charge of the oil markets, oil prices came down to a level of single digit. I got a call from my friends in Gulf countries, who explained how difficult it is to survive. They said, "We will be able to survive for a while, but not too long". If oil prices should go to USD 8 per barrel like the time I experienced, renewable energy needs another revolution to survive. Photovoltaic is a good technology, but is already pretty old. We need revolutionary technologies to make renewables more sustainable even under such severe environment. If realized, there will be peace on the earth, because disintegrated supply and consumption system of energy will be more peaceful than an integrated one. Zin this way, I go along with what Tanaka-san said.

**Nobuo TANAKA**



Leila has some additional comments.

**Leila BENALI**

Yes. Before getting into your figure of USD 8, which a lot of us disagree with, in my presentation, I showed all the different levels of cost breakdowns for different countries. Before it reaches the low-cost producers, Russia, Saudi Arabia, and others, you will have other countries which will be in deep trouble. The industry will continue not to do anything before that happens.

**Nobuo TANAKA**

What about you, Ladislav?

**Ladislav PASZKIEWICZ**

I will play the game. By the way, let us remember that at the end of the '90s, the oil price was a one-digit figure. What seems important to me as a company is not to take into account the fact that it will be forever, but that there is cyclical. Cyclical is something you can play with by being counter-cyclical, and I think that is part of the answer to the question. First, by the way, we realise that even in the two-degree scenario from the IEA, I mentioned 22% for oil, but it is about 50% for oil and gas. We should not forget from your question at the end that it is for oil and gas, because these countries produce both. It is 50% of the mix under the two-degree scenario. It is quite challenging to imagine that you will get to reduce that very significantly, but even if that was the case, and that happened in the past, investing in counter-cyclical is definitely one of the answers to the question.

**Nobuo TANAKA**

Do you mean Total will survive?

**Ladislav PASZKIEWICZ**

Of course.

**Richard COOPER**

I have a question for Ladislav. One of his five points was about biofuels. What do you have in mind exactly? The biofuels I know about, which are corn-based ethanol and palm-oil-based fuels, are terrible from a climate change point of view. What biofuels do you have in mind as a part of the solution?

**Ladislav PASZKIEWICZ**

The ones that we are talking about are the current biofuels that are being produced. That is right, because the second-generation and third-generation biofuels remain extremely challenging from the technological point of view. However, I made that point because that is one of the areas where public policy today is helping the case. This is at least in terms of emissions. We do not see that that often in other aspects.

There is some in energy efficiency, where there are some mandatory objectives that are imposed by public policy. However, we do not see it on carbon pricing, so I took the example of biofuels, saying at least here, there is a level of incorporation which is made mandatory. At the end, it helps the case, even though I agree that the impact in the future of additional biofuels may remain quite limited at the scale of the challenge that we face.

**Donald JOHNSTON**

My name is Don Johnston and I was the Secretary-General of the OECD from 1996 to 2006. I had the pleasure of having Nobuo Tanaka, our chairman, as one of our first-class directors in the organisation. I just wanted to make a few observations. I have been following this dossier for a long time. In fact, I chaired this in Doha, and you were then with



Total, were you not? You made a very impressive presentation, as you have. Total is probably quite exceptional in many respects.

We are talking about this. I do not want to be cynical, but we have heard the story so often and for so long, going right back to 1992. There was Rio, and then I came to the OECD. 1997 was the big year. That was the year of UNGA, which is the United Nations general session in New York. I addressed this and we heard about all the terrible things we were going to cure in the next few years. We had Kyoto, which other countries and we had about annexe and non-annexe. Canada for example undertook to reduce its emissions to 1990 levels. It was something like x per cent. In 2010, it abandoned Kyoto because it increased its emissions by 25%. We have seen this right across the board.

What I would just like to say is what you get out of the discussion here. You are talking about mitigation. That was trying to reduce the greenhouse gas emissions, which we have been uniquely unsuccessful in doing, or adaptation. I do not hear enough about adaptation. The fact of the matter is, look at the world today. Look around at what is happening, at the forest fires in the Western United States, at Canada, and at Northern Sweden, above the Arctic Circle with the temperatures and so on. There are the temperatures and so on. You have to think in those terms. I would like to see a talk about adaptation and less about trying to meet these targets.

#### **Nobuo TANAKA**

Finally, people are starting to talk about adaptation. That is true.

#### **Philippe CHALMIN**

We spoke quite a lot about the long term. Being on the market, I am more short-term minded, and being short-term minded, I would like to have your views about the future of our different commodity prices. I understand that Mrs Benali does not represent Aramco, but I would like to know how much more oil Saudi Aramco and Saudi Arabia can pump in the short term. Can we reach USD 100 per barrel or perhaps more?

We spoke a lot about the price of oil, but I am also struck by the price of natural gas. Natural gas prices have never been so high since the Fukushima crisis and it is a long-term trend. With Ladislav, we spoke about the commoditisation of the LNG market. What is your view on the future? By the way, this was said by Mrs Benali. The price of coal is pretty high, and the demand for coal, be it steam coal or coking coal, is pretty high. We are dreaming about renewables, but on a short-term basis, we are almost in an energy crisis.

#### **Saïd MOULINE**

As we are in Morocco, I would like to mention something which was a motion during the debate. We can confirm what we have done in this country, especially about renewables. You heard Mr Bakkoury during the lunch, but the price that we reached on the project on wind is 3 cents per kilowatt hour and 4 cents for PV. It is big power plants produced by private companies and selling at this price to the utility.

It is true that we are working to have 52% of our electricity capacity in 2030 from renewables. It is possible because we have inter-connections with Germany and Spain and soon with Portugal and Mauritania. It is also possible because we have water pumping for storage. We also have melting salt for storage in Ouarzazate and also batteries. We are talking about big projects, but do not forget, small projects, especially for Africa, like PV roofs and PV pumping, which can be used in the whole continent. It is something that is as important as big power plants, and these solutions can also be important.

The last point is this. I head the Moroccan Agency for Energy Efficiency, and the cheapest way and fastest way of reaching these climate indices is through energy efficiency. We should work on energy efficiency in transport, housing, public lighting, and agriculture. We have programmes for that in all sectors. That is also as important as big programmes. That was my observation.

#### **Nobuo TANAKA**

Are you from Masen?

**Saïd MOULINE**

No, AMEE, which is the other agency in charge of energy efficiency. We have two agencies in our energy transition policies, including Masen for the big power plants, which do renewables. AMEE is the Moroccan Agency for Energy Efficiency.

**Nobuo TANAKA**

Mr Bakkoury mentioned this sustainable energy transmission project with the European Union, Germany, France, and Portugal. That is a very interesting initiative from Morocco.

**Jean ABITEBOUL**

I am Jean Abiteboul, former President of Cheniere Marketing Ltd, so I will advocate a little bit for gas. On the short term, I do not fully agree with what has been said just now. The price of gas in the United States is very cheap. With the starting of the LNG exports out of the US and with the commoditisation of LNG, I do not believe that the price of gas will go up. It is true that in Asia and in Europe, with the price of gas index on oil, there could be some times when this price will remain high. However, this is very temporary in my mind. Within the next 2-3 years, there will be plenty of new liquefaction projects in the US, which will help the gas prices to become more and more of a commodity price, with more and more of a world price.

On the longer term, first of all, I am not sure I fully understand your curve on the cost of wind, Mr Tanaka. I am not sure these costs will go down so fast. As a matter of fact, today, all the renewable prices are still highly subsidised, especially in Europe. In the long term, if you do not build additional new power plants in the world, the numbers do not square without high development of natural gas. They just do not fly. I am not sure I understand your curve, which mentions peak gas in 2030-35. I am not sure I understand that.

On the storage of electricity, this has been stressed by Mr Cooper. Everybody emphasises batteries. I strongly believe in the future of hydrogen. You can produce hydrogen with electricity outside of peak hours, so practically, the cost of producing hydrogen can be negative or almost zero. You can use hydrogen in fuel sales even in cars. Somebody has said that cars, for mobility, you still need batteries. It is not obvious in my mind. You have a lot of technology of power to gas, to use electricity to produce hydrogen and then inject hydrogen into the natural gas network. You still have plenty of technologies which are under development and which allow natural gas to increase its market share. This is even though the renewables are seen as a solution for everything.

**Nobuo TANAKA**

Regarding the question about my information, the 2030 peak of gas is still such that the gas is increasing, even with the sustainable development scenario, the scenario of 450. Oil will peak out very quickly, around 2020, and coal will peak much earlier, but gas will continue to grow until 2030 or 2040. However, it will slow down, if a sustainable scenario of two degrees or 1.5 happens, because carbon emissions are still happening.

**Olivier APPERT**

I will give a few comments and I would like to develop the issue of the oil embargo with Iran a little bit, which is a short-term issue. First, adaptation was part of the Kyoto Protocol, and in the following COPs, it almost disappeared. Now, as you said, it appears to be quite difficult to cope with two degrees or 1.5. Then it is very important to consider adaptation. I understand that it will be an important part of the next COP in Poland. It is clear that they will not push the theme of mitigation, but it is good news. The second point struck me when we were talking about electricity. I remind you that electricity represents 20% of the problem but 95% of the comments. When we discuss renewable energy, we discuss solar and wind, but do not forget that 80% of the final energy consumption is non-electricity.



I will say a few words on the embargo. The oil embargo on Iran is one important explanation of the oil price now. Thanks to the decision taken by OPEC Plus two years ago, the market is now almost stable, in a good balance. However, on top of that, there is this decision of Trump to set up an embargo against Iran. Regarding the spare capacity, the stocks are at low levels worldwide, so the spare capacity is not so high. The official figure is 2.7 million barrels per day or 2.5, and around 1.8 in Saudi Arabia. My experience at the IEA is that regarding spare capacity, you do not know exactly when it will be possible to get this production. It may take three months, six months, or one year, because it needs some investment.

For me, what is the most challenging thing is the reaction of Iran to this position of Trump. This may create a mess in the Persian Gulf. I remember that Iran's missiles have been tested on the Straits of Hormuz, and if anything happens, it will be totally impossible to load oil in the Persian Gulf. I remind you that the Straits of Hormuz and the Persian Gulf represents 20% of world oil consumption and 25% of the LNG. It is not an increase in the prices. Nobody knows at what level it may come. We may come to USD 200 per barrel, because there is no elasticity on the market. Regarding this situation, those are the comments I wanted to make. I have very specific views on hydrogen. I am not a believer. I think hydrogen is a question of religion.

#### **Nobuo TANAKA**

Leila, do you have comments on spare capacity?

#### **Leila BENALI**

Regarding the first point, I am not mandated to talk about short-term markets and Saudi Arabia's production policy. Regarding the second point, Olivier Appert has already made all the comments that need to be made about the spare capacity. I want to say something about gas. We can be concerned about what is happening in the oil markets. There was a lot of work being done to bring those 25 countries together in the OPEC Plus Alliance, but there are also some concerns on the gas side.

I agree with the points that were made on the US, but in Europe today, gas prices are USD 3.5 dollar per million in BTU higher than the same time last year. We do not know what will happen this winter. We do not know whether we are going to have a colder winter than average or not. In many of these countries, gas prices are now being reformed and linked to international gas prices as well. That is also an aspect that I wanted to highlight as well in the meantime.

#### **Richard COOPER**

I mainly address long-term issues, but since Iran has been raised, do you not think that the 'Iranian problem' will be solved by China? China could take Iranian oil. It is substitutable for other kinds of oil, and China could well set up a clearing arrangement which does not use SWIFT or US dollars at all. Chinese firms operating in the US would have a problem, like Total would, but there are Chinese firms that do not operate in the US at all. Do you seriously think that Iran will not be able to export its 2 million barrels a day, say?

#### **Philippe CHALMIN**

What I heard on the market recently is about the Bank of Kunlun, which is more or less the only bank that has a monopoly of relationships between China and Iran. This is owned by CNPC and it has just finished accepting bills by Iran, paid either in euro or in yuan. It is said on the market that for November, no Iranian oil has been bought by either CNPC or Sinopec. That is it. Even the Chinese have problems with that right that you Americans have with the dollar. May I remind you that it did cost USD 10 billion for BNP Paribas?

#### **Richard COOPER**

We are talking about November. That is just a week away. I am not talking about November. I am talking about the next few years, and whatever happens in November has almost already happened. However, if I were advising the Chinese government, I could construct a scheme that did not use the US dollar. Nor would it involve Sinopec or CNPC, because they both have business in North America, at least in Canada. However, there is a way to do it, and the question is how

imaginative they and the Iranians together will be about bringing it about. There is lots of two-way trade. It is not just oil from Iran to China, but it is Chinese goods going to Iran. It is barter with a little fluid to grease it.

**Nobuo TANAKA**

The European Union invited China to join that clearing house. Is that right? I have heard that, but I do not know. Let us move to Masuda-san.

**Tatsuo MASUDA**

I will just make one comment on renewable energy. We talked a lot about renewable energy and storage, but we need a second and third-revolution technology. What we face regarding a technical evolution is that there are two types of valleys of death. One is the technical valley of death, to make new technology able to develop fully. That is one, and there is a lot of shortage of supply of financing. That is one, and the second is the financial valley of death.

Even though there is a demonstration plan ready to go, there is no-one to invest and there is no way to commercialise. Unless we are able to overcome all these valleys of death in technological deployment, we will not be able to have a revolution. Otherwise, we can have a technological revolution which completely rewrites the energy scene. The IEA world energy outlook could be very obsolete in a few years unless they are able to do it. We have to do that, and that is my ending remark.

**Ladislav PASZKIEWICZ**

I will make quick comments. On the price, in the short term, there are definitely some supportive fundamentals for the oil price, because demand is still significant. OPEC and Russia are well aligned. Then there is one very specific element with regard to the US, where there are some bottlenecks in exporting shale oil by pipe. Probably until the middle of next year, there will be some constraints on the US market. Exports reduced from Iran, and do not forget Venezuela and Libya. There are some countries which still face some difficulties.

This is not taking into account a fact that we have to keep in mind. The level of investments that have been made in the oil and gas industry has decreased very significantly by 2014 and 2015, when the oil price decreased. There have been some impacts that are going to be associated with that. Therefore, it is quite supportive in the short run but, for me, in the short run and the long run, the key word remains volatility.

**Nobuo TANAKA**

Thank you very much, everybody, and I appreciate your participation in the interesting game I introduced. I hope everybody enjoyed the discussion here.