FLORENT ANDRILLON

Global Head of Sustainability Services at Capgemini Invent

Valérie Ducrot, Executive Director of Global Gas Centre

I will now give the floor to Florent Andrillon, who is the Global Head of Sustainability Services at Capgemini Invent. The floor is yours.

Florent Andrillon

Thank you. I am happy because I am fully aligned with what you say on climate and energy being two sides of the same coin and we probably have lost sight of that because of what has happened in very recent times. We know we are clearly in a race against time. Time is clearly something we need to move on. I will try to give an overview of what we are seeing, and I will do that quickly because a lot of it has already been said.

The context of this transition is that we are moving from crisis to crisis. As has been said, we are in a polycrisis world. We had the COVID pandemic two years ago, which transformed into a drop in GDP and energy demand, leading to, for the first time, a reduction of GHG emissions. Then there was the rebound, which translated into an increase in the price of energy, so the government, at least in Europe, started trying to protect their consumers. We are now in the crisis driven by the war in Ukraine. While the beginning of the year was positive in GDP, we see that we are probably entering into a more troubled time for the next year. GHG emissions will probably not decrease this year but will continue to increase.

In the meantime, and I think it was rightly said by the UN Secretary General during the last COP, we are on a highway to hell, and we have our foot on the accelerator. I think that positioned the matter very well. We see that, even though everybody is talking in the COP and agreeing that carbon emissions need to be reduced, actually we are not doing so because we are not considering this side of the coin anymore. We are rushing into the energy crisis, seeking energy safety, in Europe, so we clearly are not on the wrong path, and all the commitments show that.

What we need to do, getting into a matter of time, is to get up to speed on climate change in all its dimensions. My friend Helen Clarkson from the Climate Group says that our biggest threat is climate delayism, putting climate topics further away down the road and focusing on energy safety, while what we probably need to do is what the world successfully did during COVID, which is Operation Warp Speed. How do we put all our energy into climate change and on the deployment of the technologies which are already there and on accelerating the innovation of technologies which exist all around the world, including low-tech because low-tech is also a good way? Also, Jugaad innovation is probably also something we should dig into more to save energy and reduce our energy consumption.

Just one word on this: while we focus a lot on carbon emissions and net zero goals, we forget planetary boundaries. You said it right. We are on the same planet and we focus a lot on carbon, while we should also focus on all the other dimensions that were rightly put by the Potsdam Institute and the planetary boundaries, including social justice. COP 15 on biodiversity started very recently, this weekend, and hopefully we will move from focusing only on carbon to focusing on the other dimensions. What happened is that suddenly the threat of a lack of power led us to a panic, in Europe at least, due to the increase of prices and led us to behaviors which are probably very egoist, I would say, by the different governments and, even in Europe, we see this becoming a very complex topic in terms of governance.

What has also probably changed a bit is that the Overton window, for those of who are familiar with that concept, has probably shifted a bit and is giving a bit more acceptance to a term which not accepted in the past, which is sobriety, at least in some countries, not everywhere. Energy sobriety suddenly became something at least acceptable to discuss, which was not so before. How do we suddenly move on to saying we need to save energy and not increase on energy? It is not only energy efficiency, because energy efficiency is continuing to do more with less. It is preserving energy, which is a different topic.

As Thierry de Montbrial said in his introduction, we have to be very realistic in the short term but keep on being idealistic in the medium and long term. In the short term, we saw as much LNG as possible being bought, but not enough is done on probably starting a discussion on nuclear power again. Do not close nuclear power plants. I know that is an element of debate in many countries, especially in Germany and Belgium. Regarding energy conservation, there are a lot of measures that have been pushed in several countries. We probably need to do much of that. In the middle term, we should clearly accelerate the deployment of renewables, diversify older supplies and implement electricity market reforms. There has been a start on this and it clearly needs global governance.

In the longer term, what we need to do is also to accelerate innovation. I agree with what has been said. We know that a lot of the technologies that will be needed to reduce our global emissions are not yet ready for implementation or are not fully industrialized, so we should not focus only on solar and wind. There are many more technologies available out there and in which we should invest, and nuclear is clearly part of the picture.

All of this has to be done considering that access to energy needs to be affordable and achievable for everybody, not just in Europe, but globally. Energy access is clearly a topic that needs to be considered while working on energy transition and the fight against climate change. In the previous session there was also a big discussion about the supply of raw materials. I will come back to that a bit later. Very quickly on that, I am sure you have seen the latest IEA report, which was published yesterday or two days before, with the updated forecast saying that in the next five years the world will add more renewable power than in the past 20 years. They have updated that because of the surge in renewable power that was added due to the Ukraine war. We are not there yet. We are not on the right path to reach the net zero scenario, but it is improving. That is true not only in Europe but clearly as well in India, China and the US.

Electrification and energy efficiency are the new kids on the block. Electrification is clearly being pushed as a model for the new economy. That is probably also a difficulty because it

means there is a need for new electric capacity. There has also been a strong increase in energy efficiency measures, especially in building insulation. I mean it is useless to put a heat pump in a house if you did not do the home insulation work first. There is also the nuclear renaissance. We mentioned it as well. There will be six new nuclear power plants next year, many of them in the east. Europe needs to open its eyes to the reality of the energy mix.

I will not say much more about material because I think it was rightly put, especially by Mr. Chalmin in the previous session, about the fact that the energy solution must be looked at not with naive eyes but considering the need for materials for this transition. We should, therefore, be careful not to create new dependencies. Europe probably also needs to reopen its eyes on the 'not-in-my-backyard' policy. We cannot ask others to do what we do not want to do ourselves. Therefore, if we need lithium, nickel and cobalt let us be honest with ourselves and not tell our friends in Africa, India, Asia or South America to do it for us. There are probably some ethics to put back in the game there.

Green hydrogen is on everyone's lips. As you know, it is very trendy. There is a lot of money out there. It will probably not reach the level required to decarbonize the economy, which is 15% – we are not on that path – one of the reasons being the lack of green electricity available. That means that large amounts of green electricity will need to be imported from other regions, so the geopolitics will have to change a bit because clearly some regions will be in a new position of exporting energy through the hydrogen carrier. That will be the case for Latin America, for instance, as well as Australia, Asia and Africa. Therefore, the geopolitics of energy may change a bit due to the emergence of green hydrogen, but we are not there yet and there are some technological hurdles to move this hydrogen around the world.

Climate change mitigation will depend on technology and also on large efforts by corporations and citizens. There is a lot of technology out there. The electricity mix will be done using several technologies and we need significant efforts on R&D, but we also need significant efforts in training people to display these new technologies and also to explain to the politicians that those technologies are available and that they need some support, not only financial support, but also capability support and political support. Some are sometimes struck by norms. That can be changed very easily. While we focus on solar and wind a lot, there is much more out there.

To conclude, in recent years, and we have been saying this for quite a while in Capgemini, energy supply and energy safety has been neglected. This has led to be reliant mostly on am external gas network. Clearly we have had a hard wake-up call. Energy sobriety is a critical and immediate measure for Europe, at least, to avoid disruption in supply, not only relying on the other ones. Cleary there has been a wake-up call on coal, which also drives a new technology, which the US at least are investing a lot, namely is carbon capture and neutralization, not only storage but the ability to eliminate CO_2. It is very easy to tell other countries to get rid of their CO_2 plants, but you all know that those CO_2 plants have a lifetime of 30 to 50 years and they will not disappear overnight, and all the countries that are relying on coal do not have enough resources to invest overnight in new clean energy, new nuclear plants, so CCUS will be required for the Eastern Europe countries and also for Asia. We point fingers at China for having a lot of coal-fired plants, but they need a diverse mix and CCUS should probably also be considered in the equation.

We clearly have to be realistic and the energy crisis will probably delay the reduction of GHG emissions. GHG emissions in 2022 are back to where they were in 2019, so a strong increase. In the medium-term carbon-free energy will be more dependent on domestic resources. Maybe one last word on something that was not mentioned in the previous discussion: it is circularity. I strongly believe that circularity is also a lever that is insufficiently used and explored and that is also a way to solve part of the equation. We discussed earlier about the lack of materials that we will probably face, but we do not explore circularity at all, or not sufficiently, as a lever to reuse and re-inject the materials into the economy that we need to support the energy transition. Thank you very much.

Valérie Ducrot

Thank you very much. That was a very interesting presentation. I would like to make three comments on your presentation and then launch a discussion, building on what Mr. Taneja just said. First of all, you mention energy efficiency. I have recently been on a mission in Central Asia and when we talk about energy efficiency we have to mention subsidies. When energy is subsidized it is very difficult to have prices that reflect the real market. That is a very important topic that we have to tackle in the North as well. The second point is green hydrogen. Some projects are linked with Africa, for example, that have solar farms and then come back to Europe for green hydrogen. I am afraid it could increase the gap, as you mentioned, between the South and North. This is a topic that we have to tackle and to discuss again because it is a bit contradictory. Regarding the last point you just mentioned, circularity, if we talk about green hydrogen that is partly produced in Africa and then sent back to Europe it is not circularity at all. All these topics, therefore, are on the table and I would be very happy to hear some questions or comments on them. Yes, please.

Olivier Appert, Chairman of France Brevets, Scientific Advisor of the Center for Energy & Climate of Ifri, former President of the French Energy Council

I would like to highlight a challenge which for me is very important. It is the challenge of flexibility of the electricity system. In fact, demand for electricity will grow due to the increase of the population and also due to the fact that the share of electricity in the energy mix will increase, and there is a consensus on that. On the other side, on the side of supply, there is a reduction of the dispatchable capacity in the case of the OECD countries, and it is also the case worldwide: there is clearly an increase of renewable energy, but it is intermittent. Therefore, this is creating a clear challenge to the flexibility and the security of the electricity sector. This has been clearly highlighted by the IEA in a recent report, two years ago, in the World Energy Outlook, which showed that the flexibility of the electricity sector is a challenge worldwide, in both OECD and non-OECD countries, including, for example, China, India and Africa. I think it is a very important problem because it is very difficult to store electricity.

Valérie Ducrot

Thank you, Olivier. I see two hands.

Hervé Mariton, Mayor of Crest, Chairman of the Franco-British Council, Chairman of the Federation of Overseas Companies (FEDOM)

I am Hervé Mariton. First a formal remark on the fact that Florent compared the situation in energy with the COVID crisis, asking for a warp speed reaction. There is a real danger in using the notion of urgency in the same way about different crises. I mean we had answers concerning the COVID crisis that actually challenged our democratic model and I think it would be a great danger to have this same understanding of urgency as to the energy and climate crisis, because if we answered with the same word and concept on any challenge we have then it is our whole democratic model which is at stake.

The second formal remark in a way, with a bit of a delay, to our German friend is that the self-criticism you expressed probably would not have been the same if Germany had not closed its nuclear plants. To Florent again, and indeed after your remark, Valérie, Florent insisted on the necessity of affordability to energy and you underlined the point about subsidies, and there might be a contradiction between affordability and subsidies. As the economist Christian Gollier always emphasizes, the energy transition has its cost and somebody has got to pay for it and it ends up at the consumer. It is not cows that pay taxes on milk.

The last point is on hydrogen and also the movement of industry and activity. You were stating that the IRA and the competitiveness of the energy supply in the States could have its impact on industry, but the development of renewable energies in the South could itself have its impact. I have read some analysis that said that the first step may presently be a movement from Europe to States, but once there is an important development of energy production, particularly solar production, in the South you may have this electricity being conveyed through hydrogen to Europe, but you might also have a movement of industry from Europe to the South, and this point that has got to be analyzed.

Lastly, I read yesterday that an agreement had been obtained between France and Spain as to a gas pipe, and I also heard an analysis, which I found interesting, particularly in this period, on the fact that France might then resemble – and it might have been some of the difficulties in negotiating this agreement – and would not wish to resemble a new Ukraine with a large flow of hydrogen coming from the South, from Africa through Spain and then through France to Germany maybe.

Valérie Ducrot

Thank you. Mr. Chalmin?

Philippe Chalmin, Founder of Cercle Cyclope, Professor at Paris-Dauphine University, consultant for various international organizations (OECD, EEC, UNCTAD)

I just have a question because I am not a technician. As Olivier just said, for the moment we do not know how to store electricity, apart from using mountain dams. As I understand it, the idea of storing electricity through hydrogen is not efficient enough. When I heard about the future of hydrogen my friends at Électricité de France (EDF) tell me that you need to have a constant source of power to efficiently produce hydrogen. Therefore, the idea that you could produce hydrogen to store intermittent energy does not seem to be valid. Also, Hervé Mariton said that we would build hydro pipelines. You are more an engineer than I am, but I heard in chemistry that the hydrogen molecule was so thin that it was pretty difficult to develop. How

long do you think the idea of storing power will be almost impossible to achieve? All I hear about hydrogen and so on, is it real stuff or mere illusion, at least for the next 10 years? I am not, however, a scientist.

Valérie Ducrot

Sir, please, you have the floor.

Franklin Servan-Schreiber, Co-Founder and CEO of Transmutex

I would like to provide some answers because I have dealt with hydrogen. By the way, I am Franklin Servan-Schreiber of Transmutex. I was working with a boat that had 500 square meters of solar power and we had to have batteries in order to sustain the boat there was no sun. We had eight tons of batteries, which lasted for one and a half days of power on the boat. We installed hydrogen, and I think the hydrogen tank, the storage, is solved. It took 30 days to fill 200 kilos of hydrogen, but that lasted for six days, compared to eight tons of batteries for one a half day. Hydrogen, therefore, is the future in many ways.

Philippe Chalmin

It is a long future.

Franklin Servan-Schreiber

It is not such a long future. I think it is pretty much like the RNA vaccines. I think if we hurry up, we can make it happen. There are some amazing technologies coming out of some research in Argonne Labs in Australia about mixing hydrogen with diesels, and we would need to retrofit the diesel engine without replacing them, and this would reduce CO_2 by 80%. Those are really very important. However, the one thing about hydrogen is you need a lot of water and people forget that. You need 18 tons of fresh water to make one ton of hydrogen, and if you use salt water, which is mostly the case in the hydrogen hub in Saudi Arabia and in Africa, then you reduce that efficiency by 50% in energy. Hydrogen, therefore, is the future, but the future is probably in the northern latitudes and in the Andes, where we do not have agriculture and where water is not, therefore, in competition with agriculture. Thanks.

Valérie Ducrot

That is absolutely right. Thank you so much.