

# Tipping point? The future of energy post covid-19

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In light of the ongoing covid-19 pandemic, GC has held regular weekly calls focusing on how governments are responding to the situation and what upcoming developments could look like. Global Counsel recently hosted a discussion between our Chairman, Peter Mandelson, Al Cook, Executive Vice President of Equinor, Marco Alverà, Chief Executive Officer of Snam and Global Counsel Energy Practice Lead Ermenegilda Boccabella, to explore the future of energy after covid-19. A transcript of the discussion is below.

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**PM:** Hello and welcome to this Global Counsel webinar. This is Peter Mandelson, chairman of Global Counsel and I am very pleased to be joined today by two guests, Marco Alverà, CEO of SNAM, Europe's biggest gas distribution system operator, and Al Cook who leads on Global Strategy and Business Development at Equinor. And for both of them, the next phase of their careers is going to be dominated by the energy transition, it is going to be defined by the decarbonisation the energy sector and the wider economy, so they are in effect the leaders of decarbonisation generation. Today I want to discuss with them how they see the prospects for the sector in the decade ahead. Our starting point is inevitable the covid crisis, energy has been in the frontline of its economic impact. Obviously, big operational challenges in keeping energy flowing, but also some really big numbers of the impact on energy demand. The IEA published some figures a couple of weeks ago reporting that countries in full lockdown were using 25% less energy. In all, they suggest the impact on energy is going to be seven-folds greater than that of the Financial Crisis. With it, the IEA is also predicting that we are going to see a big slam this year in investments in the sector. Ermenegilda Boccabella, Global Counsel's Energy practice lead, argued in her latest blog that the covid crisis is going to accelerate the pace of decarbonisation. Let us turn first of all to you, and ask you to set out briefly that case, and then I am going to take that to our two guests.

**EB:** Thank you, Peter. Of course, covid-19 as brought to a halt our entire lifestyle. Many people draw the link between the grinding halt and the emissions reductions. Of course, there is also the economic impact which will be fatal for many businesses and companies. If you look back at the start of the GFC, we saw economies crash, with some sectors taking heavy hits and entire industries were shaken up, but the furlough certainly hit emissions reduction efforts. Many of the environmental initiatives which were in their infancies a decade ago were stopped, and though we saw back then a significant drop in emissions that was quickly reversed. I think this time it's different, there is no going back. We saw oil prices drop to their lowest and though they have returned to around \$40 a barrel, that price is essentially just a production cost. We will discuss whether or not we have passed the peak for oil demand later. The demand for electricity has also changed as most of us were in our homes and of course the electricity grids reacted differently. The UK grid, for example, did not take power generated from coal for two months, and this is certainly going to fast-track scheduled coal powered stations closures. Germany has also been able to meet a significant part of its power demand through renewables without being plagued by flexibility issues, which were always predicted. Gas markets have too experienced significant volatility. This has meant that policymakers have no longer to be persuaded by the argument for decarbonisation, and in fact, the additional debt that we are going to accumulate

to respond to the financial crisis should not be matched by additional emissions. The International Renewable Energy Agency has said that emissions have to be cut by 70% compared to today's levels to stay within the 2°C warming target agreed in the Paris Agreement. The cost of the energy transition is something that is being discussed, especially at the European level. The cumulative investment required for net-zero is estimated to be around €160 trillion; 80% of this will have to go toward investments in renewables, increased grid flexibility, increased use in energy efficiency, upgrading the power grid, and the end-use of electrification. However, when you start to think about this at the EU level, the benefits of the investments compared to the cost is quite significant. If you look at what net-zero would cost to our economies, the projected savings are four to five times higher than that, which is also the pinnacle incentive for why we should be looking to come back from covid-19 in, essentially, the greenest way possible and why we might have in fact passed the tipping point. The Commissioner Vice President, Frans Timmermans, has warned against being short-sighted and propping up industries and sectors which are not future proof. The UK has legislated already for net-zero as has France, and the EU has legislation that it is in the European Parliament at the moment. The European Commission has proposed quite significant funding boost, where one-quarter of the funding is earmarked for emissions reductions. Shovel ready projects should be prioritised, climate action and emissions reduction should not be undermined because of this crisis, which also opens the pathway for other technologies that we have been looking at, such as the scaling up of hydrogen which we will see in the upcoming EU hydrogen strategy, to be unveiled in the coming month. Germany yesterday released their own hydrogen strategy. And all these are extremely significant for the future of energy, not just here in the EU, not just in the UK, but of course across the globe. Clean energy investments in Europe and the UK will be easier to scale up at this point in time because the scaffolding to do so is in place. Whether we have passed the tipping point or not I guess it does not really matter, but we should certainly be seeing this as an opportunity to accelerate toward net-zero. Peter, I think this a good point to bring to our guests.

**PM:** Thank you very much. I guess the question is, should we be accelerating the pace of decarbonisation and are we going to do that in the wake of covid or are we equally likely to return to a carbon-rich reality, with hydrocarbon accounting for close to 80% of our energy? Al, what is your view?

**AK:** Thanks Peter, Thanks Ermenegilda. I think it is easier in these circumstances to overestimate the short-term effects and underestimate the long-term effects. What we have seen, as Ermenegilda pointed out, at one point global demand for oil went down from its normal 100 million barrels a day to 70 million barrels a day, a reduction of 30%, at the depth of the coronavirus lockdown. What we have seen since then is the beginnings of a recovery, and China is now at 90% of its normal demand levels. And we are seeing some strange effects as well; over the last 24h in Norway for instance, the use of cars was up 28% on normal levels and the use of public transport down 16% on normal levels, and that, of course, is because people fear the use of public transport at the moment. So, our sense is that in the short term we expect oil demand and gas demand to recover to pre-covid levels by about 2023. In the long term, we certainly expect the oil demand to peak, and we believe that the transition towards greener energy will only gather momentum. A lot of what people have seen during this coronavirus crisis, particularly in Europe but not quite so much in the rest of the world, will push us towards the public and private sectors working closely together towards a greener future as fast as possible.

**PM:** Marco, it is interesting that while yesterday in the UK we did not burn any coal to generate electricity, wind and solar combined accounted for less than nuclear, and gas provided several times more electricity than wind. What is the path you see going forward out of the covid crisis?

**MA:** First of all thank you, Peter, Ermenegilda, and Al. If we step back, and we look at what the world was thinking before covid about what the world would look like in 2040, BP, Equinor, SNAM, I think we would all agree that the global outlook was to have 25-30% gas, around 25% oil, around 20% coal, and the remaining 25% equally split between nuclear, hydro, and new renewables. Whether oil is peaking I think there is no question; the pre-covid view was that oil would peak somewhere in the 20s, and then plateau into the 30s and 40s, to reach that 25%. I think covid has some permanent changes; for example, many of us would use more wi-fi and less travel to work, and I think this is a permanent feature. I expect there will be some downward pressure on oil since mobility is mostly powered by oil. That means bringing forward that peak and steepen the plateau. As we think about gas, nuclear, and coal, certainly covid has had an impact on air quality, even greater than on CO<sub>2</sub>. And we have seen cleaner air, we have breathed cleaner air. Some scientists also argue that the particles that create smog and dirty air have accelerated covid and some study show strong correlation between air pollution and lung-related health issues. I think there will be a great push for cleaner air as well as addressing CO<sub>2</sub>. Timmermans, as Ermenegilda said, intends to use the European Green Deal as a sort of a Marshall plan, and we will talk later about hydrogen and how that pans into it. But the bottom line remains that renewables are tough to balance, and so I expect that, compared to those numbers that I was giving before, I think coal and oil will shrink faster because of places like Europe pushing much harder on the renewables and on the energy transition. I think it is a golden era for natural gas which is necessary to balance out the renewables. Nuclear is very much a country-specific policy question; you see the UK going along with nuclear, you see the German trying to handle the phase-out of nuclear and coal. So, nuclear is a country-specific issue, coal is a function of the seriousness of the global CO<sub>2</sub> reduction effort, and gas is really there to help the growth of renewables and to balance the system. My last consideration on the macro picture is that some newspapers including some very prestigious newspapers had headlines in the recent days saying that, notwithstanding covid the amount of CO<sub>2</sub> in the atmosphere continues to rise. Well what a surprise, the amount of CO<sub>2</sub> in the atmosphere is like the amount of water we have in a bathtub, and the tap is never going to be turned off completely even with covid, the has been reduced for a limited period of time but it is still running. And people still confuse CO<sub>2</sub> as if there an amount that we can reduce and then live happily after. CO<sub>2</sub> is like living with a bathtub that is almost filled to the top and it is not enough to reduce the amount of the water going into the bath, we also need to think about ways to take water out before it starts spilling over.

**PM:** So, in your view covid has definitely made us more aware of the fragility of our ecosystem, it has given us an appetite for cleaner air, and therefore in your view made us permanently wary of hydrocarbons. Against that statement, let us look deeper at oil. Al, I was struck by BP CEO, Bernard Looney, saying he would not write off the proposition that we have now reached peak demand for oil, a similar view to your own - that was something previously expected in the 2030s - and the oil industry might be about to go ex-growth. Do you agree with Bernard?

**AK:** I think what Bernard said was that we do not know, could oil have peaked? Possibly. Could it continue to grow? Very possibly. And I think certainly we at Equinor expected to grow certainly from where it is today, we expected to grow toward the late 2020s in terms of peak demand. And that is really driven by the world outside Europe and the world outside the US, the non-OECD, where we simply do not see that because of covid people have given up on their desire to have air conditioning, their desire to drive their own car. So we do see oil demand continuing to grow, but in a way that we will see it peak and then reduce over time, and I think what we are already looking at how fast we need to grow alternatives in order to replace the oil and the gas, and I will give you an example from Europe. If we

would have to go to replace all the oil and all the gas in Europe now, we would need 500 brand new giant wind farms. We are currently building the largest wind farm in the world called Dogger Bank, and we would need 500 of those to replace oil and gas in Europe alone. So, we should not underestimate the challenge of doing that.

**PM:** Bernard also said that it is investors as much as civil society who are stepping up pressure on oil majors to embrace climate change policies. Is this true in your experience of your investors? Are these investors going to dig deeper in their pockets to meet the cost of the energy transition?

**AK:** We certainly see investors far more interested in this than they have ever been before. At Equinor, we used to talk about our investors and then our ESG investors, and now all our investors are ESG investors. I think though our own investors first and foremost do demand that we are a healthy business and one that continues to grow in value and it is a matter of value and values as far as they are concerned.

**PM:** Marco do you agree? In view of what Al has just said, do you think that investment in dirty oil and gas projects is now a thing of the past?

**MA:** You have two factors at play. You have this big question that we are trying to address which is hard to point down as to when it peaks, and the second after it peaks then you are in an ex-growth sector, so by definition you lose a lot of appetite from certain categories of investors. And then there is a second underlying trend of ESG which is coupled with another trend of passive investment. As you move toward index investments and as you move toward greater appetite for ESG indices, and I see this in my role at Standard & Poor's where I am on the board, there is going to be an even greater pressure than with active management. Because an active management can give you the benefit of the big effort you put into converting companies that are from fossil to renewable, and there is a qualitative discussion and you can work around that. When you move to passive investors that are making up a substantial share of the total investment market, they simply have to tick that ESG box and they will look at how much CO<sub>2</sub> you emit, they will look at how fast you can reduce it, and the point is approaching where you begin to lose investors even if you are putting a great effort and investing great money. So, I think it will be challenging for days ahead for those companies that will not make ESG a central part of their strategy. When it comes to liquidity available for ESG-type investments, then I think it is a different story. I think covid will mean that very low Green Deal investments are going to come up also outside Europe. There is a lot of liquidity out there, and a lot of these investments, as Ermenegilda pointed out, do have a positive return.

**PM:** Let me come on to renewables in a moment. Just on the ESG, is there a widening gap on ESG and energy transition between European and American oil majors? Is the ESG simply a different and bigger force in Europe both for corporate and investors than it is in the US?

**MA:** I think that was the case in 2018-2019, and I think a lot of European companies have this sense of purpose more embedded in their DNA and some of their founders, a bit further than just the quarterly just-for-profit mentality that you have more of in the US. I think that is changing, the US is accelerating quickly on its ESG momentum, and that is driven by the rating agencies that will very soon start coming out with ESG ratings. And so, each company will have its own kind of rating for their bonds and then an ESG scorecard that would just give them a score. Investors are going to look at that as well as the normal ratings. So, I think it is an accelerating trend in the US and the gap will close.

**PM:** Al, do you share that view?

**AK:** Broadly, yes. I think certainly you see a difference between the oil majors in the US and the oil majors in Europe in terms of their appetite for renewable investments. I think it is very clear that the European majors are pivoting more to renewables than the American oil and gas companies. But I think there is a concerted effort on climate, as shown by the Oil & Gas Climate Initiative (OGCI) of which American and European companies are members. I think the more challenging gap is beyond the US and Europe, where there is going to be a tremendous effort needed in order to bring the rest of the world along with this. We should remember that the European and US oil majors together only produce a small fraction of the world's oil and gas.

**PM:** Okay, let us turn our attention to renewables and look more deeply at those. The falling cost of renewables has been one of the big energy stories of recent years. A decade ago, in government we were looking at prospective costs for UK offshore wind, £150/MWh. Now there is a prospect of the cost being literally a third of that. I want to ask both of you, Marco perhaps you first, does this mean that the policy paradigm for European decarbonisation, is going to be the electrification of most things plus electricity from renewables. Is that the paradigm?

**MA:** That was definitely the paradigm and the story was of full electrification, trying to electrify everything. As the majors were dealing with rising markets for oil and gas outside Europe, the debate was governed by the electricity utilities that pushed in the last four years for an increasingly aggressive effort to electrify everything. I think the tide has changed last year, I am also the president of Gas Naturally, trying to make a counter-argument to say that, you can electrify up to a point, and if you take IRENA, the renewable energy association, which by definition are the most ambitious and strongest advocate for full electrification, they will admit that it is hard to electrify beyond 50% of all energy use. That has to do with the so-called hard to abate sectors, with much greater cost of transporting electricity than transporting molecules, which is about 20 times more expensive over long distances. With the cost of storing electricity over storing molecules, you can store natural gas for €5 and you need €200/MWh to store electricity. For heating for instance, where you have big seasonal swings, it is very hard to electrify that part of the sector. If we take IRENA's numbers, which I think are still on the aggressive side, and you think that 50% can be electrified in terms of final end-use, that is still going to require the trillions that Ermenegilda highlighted. Just to give you a sense, National grid thinks that in the UK to electrify heating you need to redo 25.000 homes per week. The cost of that refurbishment is around £200-300/m<sup>2</sup>, so trillions of pounds of refurbishment. And even then, you are still left with 50% of molecules, and I think the effort of companies like our and Al's is to green as much as those molecules as we can. We can do that with CCS, we can do that with biomethane, we can do that with hydrogen. I think we have to put all options on the table, renewable energy as you mentioned is becoming a lot cheaper. But the problem with renewables has never been their cost; they are much cheaper than nuclear in the UK, but the reason that you need nuclear in the UK today is that you need baseload that is available even when you do not have wind or sun shining. So, there is going to be a combination of baseload energy, a combination of renewables coming into our homes directly. But a big role to play is there for renewable molecules that will cater for that 50% that cannot be electrified, no matter what the costs of renewables are.

**PM:** Al, I want to know your view of what new paradigm is emerging? Do you believe that renewables are going to develop in the way that Marco was describing? Do you think that renewables are going to be the only energy source growing this year?

**AK:** Well, I think that your statistics on the costs of wind energy coming down tell an amazing story. The bids we were able to put in for the wind sector and for new wind farms just last year, were far more aggressive bids than we would have dared to imagine just a few years ago. I think Marco is right on a couple of things. Firstly, there is a whole use of energy that is hard to shift to power and we should remember that electricity only makes up around 20% of global energy demand at the moment. And there are sources for power for heat, energy for heat, and fuel that will need to find other ways of addressing. I also think that Marco is right to identify the key issue here now is intermittency. In many places around the world renewables are by far the cheapest cost for new power, but the example you have highlighted Peter, of the UK's power sources, is a really good one. And that is that yesterday in the UK it was pretty cloudy and there was not much wind and the power that came through them was negligible. Here we are today in the last few hours, we are currently getting twice as much power from wind as we are from nuclear and from gas, so that shows the problem that we have here which is one of intermittency. As governments look to provide reliable power for their population of their industry, they need to avoid power cuts. The key here is that we do not have a situation where batteries can store enough power either in terms of capacity or price to make up for the intermittency of renewables which is why we remain and retain the need to have natural gas along with a few other sources, as a stable baseload to keep things going when the sun does not shine and wind does not blow.

**PM:** Let me come to that in a moment. I just want to be clear; renewables are the cheapest but nonetheless the transition that we are talking about is going to cost trillions. In your view, can renewables access literally any money, or any capital, or any debt they need? Is that the position of the markets, Al?

**AK:** I think that is a very interesting question. Certainly, at the moment a number of firms working in renewable energy have done very well. There is an awful lot of money coming in, from funds that want to invest in infrastructure and even more money from funds that want to invest in ESG-compliant green products. What that does not guarantee is that wind, solar, and other renewable projects will make great profits. And that is where we and other energy companies really have to prove what we can do. Traditionally, we made high rates of return from oil and gas and the jury is still out as to whether we can make those returns on renewables. Hopefully, we at Equinor are targeting 6-10% rates of return. For our entire industry, the source of debt and the source of funding is not a problem. The challenge is, can we reliably make good returns going forward that justify long term investments?

**PM:** Just before we move on to hydrogen, where I know many people are now flagging its importance, Marco, where does this leave natural gas and new nuclear?

**MA:** Before talking about nuclear, on this point of capital I think it is important to look at the maths, because what Al said if they are willing to take a 6% return on a renewable project, which makes sense because a renewable project is a lot more predictable, even if the wind is intermittent you know on average in a specific region what the annual amount of wind is. Likewise, you know with great precision the amount of sun is. It is a very deterministic business that you are investing in it, it is a very predictable business. Which is different than oil and gas, and natural resource, where you need to drill, you need to find them, then you have reservoir risks, and because of what we said earlier on the availability of debt as well, and because we can put much more debt onto renewables, we issued yesterday a transition/renewable energy type of bond, a 10-year bond at a coupon of 0.8%. So, you can kind of get almost free debt for these types of investments. So, say you can put 60-70% debt at 0.8%, then that 6% can really go down to maybe 3-4%. And if you are looking at an upstream investment with

all the decommissioning costs and the question about peak oil, you are maybe looking at a 10-15% return that you want from a greenfield investment. So, you can kind of get almost ten times of capital availability for these types of transitions. That brings me to your question with gas and nuclear. For the existing infrastructure, they will work a lot where they will be allowed to work a lot. And I think in Germany as they phase out nuclear, they are going to have to replace a lot of that nuclear with gas. And in Italy, as we phase out coal, a lot of it will be replaced with new gases and new renewables. When you think about new-built nuclear it is very challenging. In the UK, the Hinkley Point cost is about £93-94/MWh. That is more than the cost of green hydrogen today made from solar and does not have the benefit of hydrogen's flexibility because nuclear is baseload. I think with today's expensive large scale nuclear is just going to be priced out of the market by renewables and gas.

**PM:** Let us move on to hydrogen. Governments are publishing hydrogen strategies and the European Commission is launching its own strategy in a few weeks. We have been here before with hydrogen back in 2003. Jeremy Rifkin in his book "Hydrogen Economy" claimed that hydrogen would imminently spur a new economic revolution. The reality turned out to be more prosaic. 17 years later I think, if I am not mistaken, hydrogen accounts for about 1% of global energy. Marco, you are an author on this subject. My question to you Marco, the second time around, is hydrogen really going to be a game-changer? And if so, why do you think?

**MA:** In my book, I have a chapter called "Third time lucky", so it is not the second time around. Because the first time was way back when we had hydrogen in our cities, and it was called city gas. And we had hydrogen as the most promising source of energy in Jules Verne's book "The mysterious island". Scientists, as the industrial revolution started, always thought hydrogen was going to be the solution. Then what happened was that Churchill essentially decided that the navy had to switch to oil to be competitive with the German ships, and that really triggered the oil revolution which made hydrogen a lot more expensive, and so we had this big 100-year oil period which saw peak at some point. The second time, as you mentioned, was in 2002-2003. I was working in ENEL at the time and I was head strategy there and I went to a hydrogen conference in Japan for 10 days and I came back thinking: madness. I mean, this is a beautiful solution, but the idea at the time was to make it from nuclear and put it into people's cars and in the end, it would be costing 30-40 times more than oil. Brilliant technology, but it is never going to work. And my mindset stayed there until very recently, two and a half year ago, when my team showed me the new maths incorporating some of the recent solar auctions. And the combination of dramatic cost reduction from solar and electrolyzers showed that hydrogen costs twice as much as oil. And here we are talking about green hydrogen or blue hydrogen. Then, of course, we also have grey hydrogen, which is the one emitting CO<sub>2</sub>, which is a huge market, it is around €100 million today. But if we talk about green and blue hydrogen, we think that in the next five years we can see hydrogen made from solar at the same price point as diesel and petrol for transport, that is the bottom line. It is technology-driven, and we are in a completely different space than we were in 2003 and certainly than we were in the 18<sup>th</sup> century.