HOUSE OF COMMONS

Scottish Affairs Committee

Oral evidence: Coronavirus and Scotland, HC 314

Thursday 9 July 2020

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Watch the meeting

Members present: Pete Wishart (Chair); Mhairi Black; Andrew Bowie; Deidre Brock; Wendy Chamberlain; Jon Cruddas; John Lamont; Douglas Ross.

Questions 311 - 355

Witnesses

I: Professor John Underhill, Chair of Exploration Geoscience, Institute of GeoEnergy Engineering, Chief Scientist, Heriot-Watt University and Member, Scottish Scientific Advisory Council, Deirdre Michie OBE, CEO, Oil & Gas UK and Colette Cohen OBE, CEO, Oil & Gas Technology Centre.

Examination of Witnesses

Witnesses: Professor John Underhill, Deirdre Michie OBE and Colette Cohen OBE.

Q311 **Chair:** Welcome to the Scottish Affairs Committee and our inquiry into coronavirus in Scotland with today's special one-off session on the oil and gas sector. I thank our three witnesses for agreeing to come in front of the Committee at such short notice. We would have liked to have given you more time, but we are really grateful for your attendance today. This follows on from the work that we did in the last Session of Parliament when we did an inquiry and report into the oil and gas sector in Scotland. It is good to see you all once again. For our record, please say who you are, who you represent and anything by way of a short introductory statement. We will start with you, Ms Michie.

Deirdre Michie: Good afternoon, Chair. Thank you very much and thank you to the members for inviting me to give evidence today. I really appreciate you making the time for us. My name is Deirdre Michie. I am the CEO of Oil & Gas UK, OGUK. We are the representative body for the offshore oil and gas industry, so we represent all the operators and 80% of our members are also the supply chain.

In our written submission to you, we highlighted the issues that Covid has wreaked on our industry and the challenges that we are facing and how the industry is seeking to respond and move forward as constructively as it can. I look forward to getting questions from the members of the Committee on that submission and anything else they care to ask of me.

Q312 **Chair:** Thank you ever so much for that. Ms Cohen?

Colette Cohen: Hello. My name is Colette Cohen. I am the CEO of the Oil & Gas Technology Centre, and I would like to echo Deirdre's comments. Thanks for asking us to be here.

I am going to take a little bit longer and put in a submission, but the Oil & Gas Technology Centre has been operating for three years and has co-invested more than £150 million with industry. This has led to a number of technologies being developed that have been directly applicable to the industry during this challenging Covid-19 period, with more than 20 technologies already commercialised that have had a strong focus on improving efficiency, reducing manpower offshore and automation. We have raised awareness of those through a technology in play campaign, which has received strong support.

I think the part that is most interesting is that Covid-19 has had an adverse effect on the technology developer community. Many are experiencing slowdown in projects, a mix of delays in field trials and cash flow issues. We have also suffered from the furlough effect where getting access to other companies is challenging because the people are not available. Covid-19 has provided an opportunity for the energy transition to accelerate in our industry. We have seen a strong uptake in digitisation,

and we are seeing a continued commitment by the industry to projects that are focused on transition and delivering a net-zero North Sea. These include things like power from the shore, automation and emissions management.

As we have a discussion today, we would like to talk about what we could get from the Government to help the industry to move forward. We would like to see industry-led technology-oriented projects that deliver a step change in how we work and/or in our manufacturing capability in Scotland. Industry needs to clearly see that commitment to a future state and the current R&D investment process, which is competition based, does not work for these kinds of intervention projects. As a result, I would like us to discuss a new approach to a new normal and to use the green recovery as an opportunity to make those changes happen at pace. Thank you.

Q313 **Chair:** Thank you very much, and, again, thank you for allowing us to introduce our last report at the Oil & Gas Technology Centre in Aberdeen. I think it was a very useful and productive day, which got lots of coverage, from all reports. Thanks again for that, Colette.

Colette Cohen: Thank you, Chair.

Q314 **Chair:** Lastly, Mr Underhill, please say who you are and who you represent and anything by way of a short introductory statement.

Professor Underhill: Thank you very much. Good afternoon, everybody. I am the Professor of Exploration Geoscience at Heriot-Watt University. I am also the Academic Director of two centres of PhD doctoral training, one in oil and gas, which is a partnership across the UK involving 17 universities, and the second—and perhaps of more interest to today and the future—is in geo-net-zero and how geoscience faces the low carbon energy transition and challenge of net-zero as we move forward. I populate the Scottish Government's Scottish Science Advisory Council. I am on the Oil and Gas Authority's Exploration Task Force, and one of the reasons I am here today is as part of the Royal Society of Edinburgh's Energy Inquiry Team.

The elements that I feel I can bring to the session today are on technical aspects, such as geoscience, particularly around safe storage of carbon dioxide, hydrogen, geothermal and also the oil and gas exploration challenges and opportunities ahead. Finally, I feel that I can bring the training in skills element piece into the equation, including repurposing to face and address decarbonisation and a net-zero future beyond the Covid-19 pandemic.

Q315 **Chair:** Thank you. What wasn't in your biography was the fact that you were a referee 10 years ago and we have already had an exchange of referee stories with Mr Ross, so thank you for that. That is a little thing that is worth mentioning from your CV.

Thank you all very much for those very concise introductions. We are hearing that this is a sector that has been particularly badly impacted by

Covid. It would be helpful to the Committee if we got a sense of how bad that is. Where has it impacted? How has it impacted and what do you see as the way to help secure that type of recovery? We want to get an overview of where we are with the oil and gas sector.

Deirdre Michie: Building on some of the points in the submission and that Colette picked up on, we are challenged. We have been hit by what we are calling the triple whammy of Covid, the dramatic drop in the oil price and the low, low gas prices. As a result, we saw industry having to respond by reducing activity levels by about 40% and then also the economics, because we saw projects being pushed back and jobs being lost. Of course, it happened pretty quickly, overnight, and in a global context. We saw CAPEX activity reduced by 30% and OPEX spend reduced by at least 20%. We saw and continue to see the supply chain, which has been particularly fragile because we were just coming out of the last downturn, under particular pressure, given that their revenue is down by about 33% and their cash flow is very stretched.

As a result, jobs are under pressure. We put out a report about two to three weeks ago, which estimated that if current conditions continue to prevail up to 30,000 jobs could be lost across the industry. That is a very challenging situation to find ourselves in. Current estimates are about 7,500 jobs have been made redundant to date. We think more are on the way once the furlough scheme comes to an end and if activity does not pick up.

What have we been doing about it? The industry has been focused on three phases. We talk about the protect phase, the recovery phase and the accelerate net-zero phase. The protect phase has been all about industry coming together to keep production going, to make sure that our personnel are well and kept safe in their offshore operations, and production has been sustained and security of energy supply has been supported during this difficult time for people. We continue to go through that phase, but we are also now looking at what we are calling the recovery phase. That is all about, as lockdown starts to lift, how do we start to stimulate more activity to protect and retain the jobs that are absolutely crucial to the oil and gas industry today, to the economics of the country and to future prosperity and future ambitions in a net-zero context.

That takes us to the third phase, Chair, which is all about accelerating net-zero. We see a once-in-a-generation opportunity to look at the net-zero ambitions of Scotland and the UK to see how this industry can contribute positively to accelerating our way towards delivering on the net-zero ambitions that Scotland and the United Kingdom are working towards. To do that we have to make sure we protect and sustain the jobs that we have. The skills that we have in the industry today will be crucial to how we make sure that this industry decarbonises its own activities and then looks to support the economy and the country move to managing its emissions with stimulating carbon capture and storage at scale and, also, the hydrogen economy.

They are difficult times and this is very personal for people. I talk about the fact that we are a big international industry but we are a very small community. You feel it specifically in certain parts of the country. Certainly we are feeling the impact in the north-east of Scotland, because if you are not under pressure in your job, you certainly know people who are or you know people who have lost their jobs or are worrying about losing their jobs. They are testing times for us.

Before I close on this point, the other thing, Chair, is that we appreciated the Government's package of the financial contribution. We have seen our members using the furlough scheme and accessing the CBIL scheme and some of the other opportunities from the Scottish Government as well. They have benefited from that and it has been helpful. We have been very appreciative of that and also of the way that both Governments have worked with the industry to support it.

Q316 **Chair:** Thank you, Colette; 30,000 jobs that is an awful lot. I think the figures I have here is the oil and gas sector supports a total of 250,000 jobs throughout the whole supply chain. What sort of jobs are we talking about here with these types of losses? What do you see as the maximum number of jobs and the activity that might be lost because of this downturn?

Colette Cohen: I think Deirdre has outlined that and explained the challenge. I would highlight that we deal a lot with the smaller companies while Deirdre is dealing with the broad spectrum. She has a lot to deal with on the major operations and big tier 1 companies. We deal with a lot of small developers and their resilience during this period is a lot less because they are relying on the next contract or on jobs that have been agreed actually going through.

We are now seeing this delay for some of the developers. Quite often it is just access and it is totally understandable because we are trying to minimise the number of people offshore or on facilities so that we can manage the pandemic. Ultimately, that leads to anything from four to six or eight months' delay and for small companies that is very hard to manage. They are not getting that much benefit from some of the Government schemes, so ultimately that is another challenge for them.

From our perspective, what you are going to potentially lose is that part of the innovation network, the ecosystem that we have been investing in through the Oil & Gas Technology Centre and other groups like OGCI and OGIC over the last few years. We have to be careful about that because we see that innovation truly comes from a lot of these small companies. It is deployed and it is used. It is scaled by the larger companies, but we need these innovative little developers to survive during this period.

We are also seeing the same problems with some of our TechX. As you know, that is our accelerator programme where the companies are very embryonic. At least half of them are under severe financial constraints right now and whether they will be able to survive—because if you cannot get

into your workshops or move your technology forward or sell your ideas, you do not have sufficient funds in the bank to carry you for six, eight to 10 months.

The point is that you are going to lose the jobs that we would see as more traditional—some of the offshore jobs, some of the operations and maintenance jobs—but I have a greater concern that we are going to lose part of a really important innovation culture that we have been growing for the last three or four years.

Q317 **Chair:** I am grateful. Mr Underhill, the oil and gas sector has just started to recover from the slump in oil prices in the middle part of the last decade and now it is having to experience this. Is this actually worse for the sector than what we saw a few years ago?

Professor Underhill: It certainly is an immediate direct impact, yes. If I give you a bit of background from an academic standpoint, we have been seeing a steady climb in students applying for geoscience, going on to further postgraduate studies and MScs and PhDs and then on into the industry and allied sectors. We had 1,400 entries for geoscience in 2002. It went up to 1,900 in 2014. Before Covid came along there was the challenge and we dropped to 1,050 in 2019. That is a 45% drop in five years of students wanting to study geoscience topics that naturally lead on to oil and gas and other environmental science disciplines. That is before Covid.

Some of that is also, of course, the perception that the career is leading to the extractive industry or fossil fuel production and that social licence and challenge in the current environment is there as a backdrop. I think we need to talk about that in the broader context of education and oil and gas specifically. The skillsets that one needs for a net-zero challenge and low carbon energy transition are still things like seismic interpretation, well log analysis and core descriptions, the things that have been used for decades to understand the subsurface in the North Sea for oil and gas extraction. Those very same skills are going to be needed now to understand the subsurface for carbon storage, safe storage, hydrogen storage, geothermal and so on. We need that talent coming through the education pipeline.

To answer your question specifically about Covid and the impacts, what we have been seeing clearly in the university sector is the challenge of students: will they come to undertake studies? If they do not come, of course, fee incomes drop, particularly those from the rest of the UK and Scotland or from overseas. The direct impact that we are seeing of Covid is that companies are no longer supporting internships, for example. They had set them up for students to go and work in the workplace and industry. Those have been either cancelled or postponed. Projects have been dropped, so funding for new projects. Direct recruitment of students into industry has tailed off. The opportunity to have mentors from industry is not available to us, given the pressures on individuals. The support for research, development and training is under threat, and we are seeing contractors and staff sadly losing their jobs within the industry.

The impact is that you cannot really justify funding external educational opportunities when people's livelihoods are at stake and people are losing jobs, so I absolutely sympathise and appreciate that the challenge is there. Covid has had an immediate and direct impact on all those things: internships, projects, recruitment, mentoring and so on, and the support in R&D.

A specific example, as academic director of the central doctoral training in geo-net-zero, is that we have 12 university partners and nine industry partners, sponsors that support the training programme. All of them will be looking at the relatively modest sum that they put in to support the training programme but, of course, if we lose those sponsors, the ability to train the next generation of geoscientists to tackle geo-net-zero and a low carbon energy transition will be under threat.

Q318 **Chair:** Thanks for that. We have lots to get through, so we are just trying to get a synopsis of the situation.

The last time this Committee looked at the oil and gas sector we made a number of what we felt were considered and thoughtful recommendations. Most of them were about the oil and gas sector's own Vision 2035 and the call for a sector deal from the UK Government. More specifically, we looked at the low carbon transmission, how we retain and hold on to skills that have been developed over decades. What impact has Covid had on all these ambitions? We did not quite convince the Government to give us a sector deal, but we are still hopeful that something will come through to be able to support as outlined in Vision 2035. Where are we with what we concluded in our last report? Has Covid thrown all of that off target, particularly with low carbon transition and skills retention? I can see Deirdre's hand going up there, so we will come to you first with that one, and I know Colette will want to say something on that.

Deirdre Michie: Thank you. The quick answer is, no, it hasn't thrown everything away. What it has done is reinforce the need for Roadmap 2035. Vision 2035 evolved into Roadmap 2035. To remind the Committee, we developed Vision 2035 as we were coming out of the last downturn to reinforce the fact that this is a critical industry that needs to be contributing longer term to the wellbeing of the country. The Committee on Climate Change report came out at the same time as we went around engaging with industry and stakeholders. We had by that point evolved the vision into the roadmap, setting out how we would seek to develop and deliver the vision.

Roadmap 2035 is a direct response to that stakeholder engagement, industry engagement and the Committee on Climate Change report, which sets out the net-zero targets for 2045 and 2050. I hope that the Committee knows that we were one of the first industrial sectors to respond positively to the Committee on Climate Change report, setting out the fact that we, as an industry, would commit to be a net-zero basin by 2050 and that we would support the aspirations of the UK and Scottish Governments to deliver in that context. That was all moving along very nicely, thank you

very much. Covid then hits. We deal with the protect phase, the recovery phase and then, as I said Chair, we have this third phase of accelerate to net-zero.

Moving through Covid and out of Covid, it has become even more apparent that we need to accelerate the path to net-zero. Roadmap 2035 is even more important because it set in context the contribution that the industry can make to supporting the UK in its energy needs longer term, while also supporting the transition to a net-zero future. We see Roadmap 2035 as being instrumental to a green recovery.

Trying to accelerate the move to a net-zero outcome is work that has been ongoing on the sector deal. While we have been working with industry in the protect phase and now the recovery phase, there has also been a lot of work ongoing in relation to the sector deal and how that can be a catalyst for Roadmap 2035. We are very hopeful that it will be an enabler to progressing the work that industry is doing and, also, the work that is being done across the UK and Scotland. It has six commitments that talk to industry reducing its own footprint.

Two weeks ago we published a document and our commitment to reducing our own emissions by 50% by 2030 and by 90% by 2040. The other commitments also talk to support to carbon capture and storage and the opportunities that are playing in that context, and also our contribution to a hydrogen economy and skills and jobs. The sector deal is very focused on stimulating jobs in the economy, helping to deliver net-zero and security of energy supply for the UK. Jobs and the supply chain are also a key element of the sector deal, as are—and I am segueing nicely, you will be glad to know—innovation and place and technology.

One of the things we are working on is the energy transition zone with Opportunity North East. We see a massive opportunity to develop an energy transition zone in the north-east that can be replicated in other parts of the country. The other aspect is also the technology links and so that point is where the work that Colette and her team—

Q319 **Chair:** That brings us very neatly to Colette. Just briefly, Colette. We want to try to move on now because we are taking up quite a lot of time discussing these basic concepts.

Colette Cohen: We see ourselves as the technology enabler of the Roadmap and the Roadmap is a blueprint to net-zero, so our role is to develop and deploy technology that enables that. The point I made in my opening statement that I would like the Committee to take away, however, is that we need to change our approach to investment in R&D. Ultimately, you need intervention-style projects, energy hubs, big opportunities, direct air capture, that do not suit the current innovation process. It cannot be competition-led if you want to get it at the pace we need.

For the industry to see this transition and for the next generation to see opportunities to work with us, we have to show what the future looks like

and we have to start investing in those opportunities and the technology now. I feel that only the Scottish Government, with their £62 million fund, have recognised that we need to go quickly. From the sector deal perspective, it needs to be a fast deal. We spent a lot of time talking about it previously.

Q320 **Chair:** We saw your response, Ms Michie, to the Chancellor's announcement yesterday, which you welcome. What specifically was in that for oil and gas? Obviously, furlough has been a great concept and the oil and gas sector has benefited greatly from that. When it is over, when the conditions pick up, is there anything you detected in what you saw yesterday that is going to specifically help oil and gas? Just briefly if you can, Ms Michie.

Deirdre Michie: We welcomed the announcement on the basis that it focused very much on jobs and on supporting jobs across all industries. There were other aspects of it, such as the air capture approach, that were also very welcome. Our point was that we are looking for short-term support for jobs and the furlough scheme but also longer-term support for where industry goes in a net-zero context. The Budget in the autumn will be a key point for us, at which we would like to see very positive statements from the Chancellor and the Government about the sector deal and what industry can contribute in that context.

Q321 **Andrew Bowie:** Good afternoon, everybody. It is very nice to see everybody again. I am speaking to you from a part of the world that is watching the developments regarding Covid—but especially the developments in the oil and gas industry—with much concern. A lot of the supply chain, which you have already spoken about, is based here in West Aberdeenshire so I am very much aware that people are already seeing restructuring and redundancies coming through up here.

Ms Michie, you spoke about how the industry has come together to get through the current crisis. Would you say that that is a lesson learnt from the 2014-16 downturn? Something that I think we have spoken about before is that, prior to 2014, a lot of companies were very siloed in their responses. One of the lessons we may have learnt from what happened in 2014 is that to get through stuff like this the industry has to work together and pool resources.

Deirdre Michie: The way industry has come together has been exemplary in the operational aspect of making sure that people were kept well and safe, operations have been carried out safely and effectively and production has kept going. We learnt some tough lessons during the last downturn with cost cutting and jobs being lost. I think there was very much a learning that when you work together you can pool efficiencies and get a lot of benefit out of that.

I do have to say, though—because if I do not say it somebody else will—that we are seeing businesses under pressure and behaviours that are not exemplary. It is tough times out there and we are seeing rates being cut

and businesses being very challenged. In the operational phase, in the pulling together, in the "let's keep this going," it has been really good. There were bumps. We did get some things wrong, communications dropped, there were inconsistencies, but overall industry did a good job in keeping things going in that context.

Q322 **Andrew Bowie:** To follow up immediately on that, one of the things we saw in direct response to 2014 was the huge economic stimulus—I think it was something like £2.3 billion-worth of tax—in support for the industry from the UK Government, creation of the OGA, the OGTC, the OGIC, all that. Has the framework that we developed in response to what happened in 2014 helped the industry react to what it is fighting now?

Deirdre Michie: Yes, absolutely. The setting up of all those and the coming together as we worked through the last downturn and got ourselves to a point where we were more competitive, we were attracting investment, jobs were being sustained and increasing, was testament to those various elements and the tripartite approach that we all took on it.

As we have gone through this next downturn, we have worked really well with both Governments, officials and the regulator, who we have found to all be very open, accessible and supportive. Now, as we go through the recovery phase, we have to work together because we know that is the only way we are going to be able to support jobs in the short to medium term and also then do the acceleration of the net-zero. We have to take forward the tripartite lesson we learnt and we are taking it forward.

Q323 **Andrew Bowie:** Thank you. Working together, we managed to turn the North Sea, between 2014 and last year, into one of the most attractive mature basins in the world in which to invest, which was quite a success given where we had started from only a few years previously. Colette, if I turn to you, the OGTC grew out of the 2014 downturn. Where do you see your organisation adding value to the industry and to the wider sector as we move through into the next stage of recovery from this downturn?

Colette Cohen: In a number of ways. We are already adding value in the 20 technologies that were commercialised. For a young R&D organisation to already have 20 technologies that are new and commercialised, with only three years of investment, is quite a record. What has been really positive about those is that there is good uptake but they are very focused on reducing manpower, reducing downtime, improving efficiency, improving costs, but also rent automation, data analytics, all the sort of stuff we need to move into a very net-zero operating world. Therefore, there is already some delivery that has been helpful.

We are also oversubscribed, which is a very positive thing for other projects working with the industry. We are seeing a lot around robotics, automation, autonomous vehicles, that sort of investment, which is obviously in support of the roadmap.

As you know, last year we opened a Net Zero Solution Centre, which is really to try to drive this transition. Ultimately, as an industry, we want a domestic hydrocarbon industry that can turn up delivery in hydrocarbon with a green footprint. We have been developing some quite large-scale projects with industry, which look at things like power from shore, direct air capture, some of the stuff that has been mentioned in the Budgets recently. What we are looking forward to now is working with both Governments to get that supported. We have industry behind us, locations and opportunities. It is important now, though, that we move from talking about the numbers to investing in the projects and making some progress.

Q324 **Andrew Bowie:** I completely agree. I know we have a lot of questions to get through. Professor Underhill, could you briefly touch on the oil and gas price? The price of oil is obviously the sexy one. It is the one we talk about all the time, but I remember back in January, before Covid even hit, it was the low price of gas that was causing quite a bit of concern in the North Sea. Given the importance of gas to our move to net-zero and to the Vision and Roadmap 2035, what is the gas price that you would say is sustainable for us to continue production in the North Sea as we move to be more heavily reliant on that?

Professor Underhill: The key element there is that gas demand, as we wean ourselves off oil and coal for energy, is absolutely crucial for the future prosperity and safeguarding of jobs and of the industry that is so important. It is worth remembering that in the Committee on Climate Change report, oil and gas still has a 45% role to play come 2050. We are not going to get away from the fact that we will need oil and gas to continue to be important within the economy in the UK, even with renewables.

We have done a very good job with electricity and the renewable supply, but we definitely need to be thinking about how we move forward with heating, industry and transportation. Gas is absolutely crucial—clean gas and potentially the hydrogen economy in the future—in that regard.

Deirdre Michie: Mr Bowie, I am going to add to what John was saying to reinforce the point you make about oil is something that is always on everybody's headline, but when you look at the actual price of gas it dropped to below 10 pence per therm and it is averaging around 19 pence per therm. Actually, we need about 20 to 25 pence per therm for ongoing production and even more to get projects off the ground, so I just wanted to reinforce the point that you and John were making. We focus on oil, absolutely. Gas, though, given it is also part of the transition fuel, is under real significant pressure, and we should not lose sight of that.

Q325 **Andrew Bowie:** If the Chair will allow, I will talk very briefly about the supply chain, because of the impact typically in my constituency. We have spoken about how it was just emerging—because there is always a lag—from the last downturn. What specifically do you think that both Scotland's Governments could do to support the supply chain, in particular, through this incredibly difficult period, given that there will be a lag, even if we do get to the point where the oil and gas price increases in the immediate

future? That is open to anybody.

Deirdre Michie: On the Government support, I think the financial packages have been helpful. For example, we know that some of our members are using the CBIL. Going forward, a plea to both Governments is for asymptomatic testing. If we can get asymptomatic testing for our offshore personnel, particularly, as we start to increase activity and as we go into the winter months, it could be so helpful for us to increase activity in a way that gives offshore personnel much more comfort. We have done a very good job in putting the barriers in place and reducing the numbers of symptomatic cases offshore, but we need to be ready for second spike and winter going forward. That is the first thing I would say.

On the recovery piece, there is a number of projects on hold. The OGA has been working on a plugging abandonment programme, so that is something that, with the support of Government, could very much help the drilling part of the supply chain. The Chair asked specifically earlier which parts of the sector are particularly under pressure. It is the drilling subsea and any parts of the supply chain that have been associated with capital spend and project spend. That is another enabler and, also, support to the global underwater hub, which was part of the initial sector deal. Those are key areas that could be very helpful going forward.

Q326 **Mhairi Black:** Thank you to our guests for coming to talk with us. It is very informative, especially for someone who does not represent the north-east. You have explained really well about the impacts and the triple whammy that the industry has faced so far, but what will be the real life impacts if there is a second wave? That is open to everybody, thanks.

Deirdre Michie: It is a really good question, and I think we probably do not know. It is about making sure that everything we have learned so far—and what we did as an industry was put all the barriers in place—temperature testing, social distancing, cleaning regimes—and together they helped to reduce the number of symptomatic cases that we were seeing in the industry; all barriers, all cumulative effects and no one thing solving it all.

As we go forward potentially into a second wave, I think the issue is that it gets more complicated. Up until now it has been a bit binary, "Everybody in lockdown. Everybody do this. Everybody do that." As we move out of lockdown and there are more questions to contend with, I think it will become more complicated. That is why we need to be really thoughtful about what the additional barriers are that can be put in place. For example, if we are going to have to socially isolate because we have coronavirus symptoms, we might also have to if we have a cough or a cold, because we are still going to get coughs and colds but we don't know what that is. If we had access to testing, we could rule that out and move forward. We are going to have to be very thoughtful about those kinds of things as we start to lift restrictions and activity.

Colette Cohen: From a technology perspective, I would like to see us starting to assume that these kinds of events may not be as rare going forward and that we have to have a more flexible approach to work and delivery in the workplace. Hence, we have already seen an improvement in our use of digital and automation.

There are two things here. One is that we need to drive more into the remote operating capability, but, simultaneously, if we are to avoid major job losses, we have to move more rapidly towards implementation and manufacturing of the next generation of wind and hydrogen and direct air capture, so that we have these highly skilled jobs to replace. We have to think like that. We have to move more into the manufacturing arena if we are going to be a little bit more resilient in the future.

Professor Underhill: I would add that that word "resilience" is absolutely key. If we lose some of the pipeline and infrastructure—as you recognised in the report that you produced—we are not going to get a second chance to reutilise that for the net-zero future, so there are some unintended consequences. It is important to think beyond the short-term impact to: what are the medium and long-term impacts of the pandemic? It is like a pack of cards falling over in line, and we want to make sure that the opportunity is there to develop the subsurface in the North Sea for a different repurpose, which is in the carbon storage, hydrogen storage and other net-zero ambition areas.

Q327 **Mhairi Black:** Excellent. Thank you very much. Following on from that, we know that this pandemic has been a crisis and nobody would want it. However—particularly asking Mr Underhill and Ms Cohen—do you see a real opportunity to move from the technological side because there has been this big setback? Is it the chance for radical thinking on investment and where we can go with different ideas?

Professor Underhill: Yes, I absolutely agree with that, Mhairi. The opportunity space is there. It was there before Covid. There have been changes with recognition of climate change, the United Nations sustainability goals and the like, so that opportunity space is there. I think what this has done is to bring into sharp focus the importance of the North Sea and the UK continental shelf in general for being able to fulfil those ambitions and the skillsets and expertise that we have. The concern is that we are going to lose that and we are not going to be able to recruit the next generation to tackle it—if we could solve that conundrum. We have the data and the subsurface, and as you recognised in your report, there are a number of technologies that could be deployed, and they are almost oven ready to be so. I feel that there is a great opportunity.

To come back to the earlier point, and your report where you stressed the importance of a sector deal, this has underlined and put into sharp focus the need for that but to expand it beyond oil and gas into the broader context of low carbon energy transition and net-zero. I would encourage you to redouble your efforts in trying to get support for that sector deal but to expand its remit, because you recognise all the key elements in that

original report. I think there is an opportunity in the medium and long term, and this is the time to do it.

Colette Cohen: I would reflect that over the last year the industry has moved quite a long way towards the net-zero and the need to diversify and transition. That is where Roadmap 2035 evolved a lot over the last 18 months and became much more focused on a net-zero delivery. There is not only an opportunity but there is a willingness.

A couple of things are lacking. We need a very clear energy strategy and it needs to be a more integrated energy strategy that allows for the supply chain to understand where its opportunity is and where it should be investing. Are we going to become a hydrogen economy? Are we going to use carbon sequestration? Is it just for our own industrial clusters or are we planning and providing that for Europe? There is a lot of things that would make quite a difference in how you would invest if you were in a supply chain.

Finally, there has been a huge amount of commentary on quite large sums of money becoming available in R&D. The forward commitment by the Secretary of State of £22 billion per year by 2022 is fantastic, but ultimately we need to start developing a more effective, agile way of investing in that. We need to sail fast so we can move on, because we have to decide as a nation what we want to lead in and what is going to be important to us. We have not done that. I think that prior to the Covid crisis, we have stepped away from a manufacturing nation. It highlighted to a great extent how important it is to have your own indigenous manufacturing capability. We need to use that lesson and make sure that it comes back into our energy sector and other industrial sectors.

Q328 **Mhairi Black:** When you say that we need a more integrated response, is that the UK Government and the Scottish Government working together or is that more to do with people working with the sector?

Colette Cohen: It is kind of a combination. Definitely you need to have an integrated approach for Scotland and the UK. Energy does not stop at the border and we need to understand that. If you think about the hydrogen backbone that is being proposed currently by Europe, it has one touchpoint into the UK. That needs to be across the UK if we are going to become one of the largest exporters of hydrogen. That can only happen if the UK and Scottish Governments have an integrated approach to how they are going to do that, but I also think it needs to be integrated across the energy sector. We have an alliance with the Offshore Renewable Catapult, because we recognise the importance of working together to diversify the supply chain and to get the right technology into the North Sea.

We need to think about that while there may be individual sector deals, because that is appropriate, there is also a need for the overall strategy to be more integrated across the energy horizon.

Professor Underhill: I would like to add a point about being joined up. There are dependencies. For example, if we have parts of the UKCS covered by windfarms, what it rules out is being able to do the oil and gas exploration, the carbon storage or the hydrogen storage in those particular areas at the moment. There needs to be more joined-up thinking between the individual agencies via the OGA or the Crown Estate to ensure that we do not lose opportunities in the North Sea by taking one particular decision and having an unintended consequence that you cannot then do the hydrogen storage or the carbon storage in a particular place when you would want to.

Q329 **Mhairi Black:** I see. Ms Michie, I think you wanted to add something.

Deirdre Michie: Yes. I wanted to build on what Colette and John were saying. On what industry is already doing, certainly in reducing its own footprint, the sector deal is very clear that it needs to reduce its own footprint and needs to work with other sectors to do that. For example, you could see the electrification of offshore platforms and linking those to windfarms. That would be the way they would seek to decarbonise their own footprint.

Other elements of the sector deal are relating to carbon capture and storage and also to hydrogen, so this cannot be done solely together. It is very much about reaching out and working across other sectors. Also there is a coming together in that context of the link between what Scotland and the UK do.

Q330 **Douglas Ross:** Good afternoon to all our witnesses. It has been an excellent session so far. I will come to Ms Michie first and follow up on the final question from the Chair, who was asking about the support that Oil & Gas UK gave to the Chancellor's up to £30 billion package yesterday. On "Good Morning Scotland" today, Scotland's Finance Secretary questioned what Oil & Gas UK had said. The SNP put out a press release saying there was nothing for the industry, yet the industry broadly welcomed it. I was surprised when Kate Forbes was asked for a reaction to Oil & Gas UK's statement. She said, "Well, I would wait to see if that changes over the coming days." That suggests from Scotland's Finance Minister that Oil & Gas UK had not done its homework before issuing its statement, something I would totally disagree with. Ms Michie, how do you respond to that from Scotland's Finance Minister? Did you know all the details before making that comment? Should we be anticipating a change in your appraisal of the Chancellor's statement?

Deirdre Michie: I am very clear that we did welcome the support that was given to jobs; it was a jobs package. Our point was that we reinforced the fact that we face this once in a lifetime opportunity to deliver in a low carbon context and that we need to make sure that that is picked up going forward. We are very clear about what the package that was delivered yesterday was supporting. We know that our members can continue to benefit from it, but we are also very clear that going forward we need both Governments to reinforce the commitment to net-zero and to contribute

and support industry in its transition to net-zero. That is why we welcomed the moneys that were being made available to direct air capture, as an example.

Q331 **Douglas Ross:** In direct response to Scotland's Finance Minister, the SNP's Kate Forbes, we should not be waiting for you to change your opinion. You based your quote yesterday on the evidence you were presented with and you look forward to the autumn statement.

Deirdre Michie: I think you have probably said it for me.

Q332 **Douglas Ross:** Thank you. Could I move to Professor Underhill, because I am going to quote from his evidence? I would like to open it up to both Ms Michie and Ms Cohen as well. Professor Underhill, you gave evidence to a Scottish Parliament Committee in December last year. A lot of what we have spoken about so far today has been the support of Scotland's *[Inaudible]* in getting the backing of Governments to take forward technologies and our future plans for a green recovery. What we have not spoken about and what was missing in your evidence was about getting public support. Where do you think the public are in Scotland to support a number of these measures? Maybe for those who have not read the evidence, I thought you gave an interesting example of Holland, where you had one technology that had no public backing and another that did. Where is Scotland six months on from your evidence in the Scottish Parliament?

Professor Underhill: The challenge is there in social acceptance and the social licence to operate. The subsurface, for many folk, is a real unknown and a bit of a scary place. I will touch upon the examples that I gave to the Scottish Parliament. In Holland, earthquakes have affected Groningen. There has been subsidence, and it has led to the Dutch Government deciding that the gas reserves that it has in the ground should remain there. The impact of that is that the Dutch Government then encourage offshore exploration. That exploration has largely been undertaken over the last 50 years, so it then has to seek imports. Groningen gas has nitrogen naturally within it and that means that the Dutch Government have to add nitrogen at cost, as well as having the security of supply issues. There are lots of dependencies and impacts that come from a decision made.

The other example I used from Holland was Barendrecht, which is a small village where the public were not engaged on the opportunity to store carbon dioxide in a depleted field beneath that village. The first they got wind of it was, "Crikey, this hazardous gas is going to be put underneath us and might leak," and because of the lack of public engagement and communication and outreach, there were protests and that particular idea was dropped.

It is important to have the social engagement and the licence to do the things that we would wish to do as we go through either the oil and gas space or the energy transmission that comes from it. Without that, it will

not happen. We have seen that with fracking in Lancashire and elsewhere in the UK and the public protests that result therefrom.

Q333 **Douglas Ross:** In your evidence, you mentioned that these are extremely complex conversations to have with the public. Do you think there is a suitable level of understanding of what is being suggested and hoped for among the general population in Scotland and potentially across the UK? I would open that up to Ms Cohen and Ms Michie after Professor Underhill.

Professor Underhill: I agree that there is a need for this to be done, and I do not think it is very effective at the moment. It is quite hard for the oil and gas industry because people say, "Oh, they would say that anyway." It is important for the academic community and others to be able to show the scientific evidence for and against any of the particular processes that you wish to deploy and to win that social licence to operate.

To give you a couple of examples, there is a real challenge over carbon dioxide storage, one of which is that you need chrome-plated pipelines. That means you cannot necessarily use the existing infrastructure, which is for methane. We need to explain that and ensure that there is an understanding of what the challenge is and the costs that are associated with it. The same is true for carbon or hydrogen storage. We have to ensure that the seals are robust and safe on the long-term geological scale, because we do not want leakages either through well integrity or the geological physics or chemistry of that particular seal failing.

Those are complex issues. We have to try to explain those and articulate those and ensure that everybody is aware of what the challenge is, what we are doing about it and the data and the expertise that goes into ensuring that these things can be done safely.

Q334 **Douglas Ross:** Ms Michie, how much of the work of Oil & Gas UK is dedicated to engagement with Government and how much is trying to sell your message to the wider population?

Deirdre Michie: You broke up a bit. Are you just breaking up for me or is it happening to everybody?

Colette Cohen: How much are you directed towards industry versus the public?

Deirdre Michie: How much of our efforts are? Fine. Of course I will answer that. Can I build on what John said as well though, just to reinforce what a highly regulated industry we are, which I think will play in our favour, and that we have extremely high safety and environmental standards. That is something that we need to reinforce also. Back to your question of how much—sorry, Colette, what was it?

Colette Cohen: It was dealing with that messaging and that communication between talking to Government and industry versus being able to share our story or our challenge with the public.

Deirdre Michie: It is an ongoing challenge for us, and we work hard to raise the profile in a very positive way. If you think about it, our industry is quite an invisible industry. Everything is offshore; you get the benefit of it; you do not care about the fact that your iPhone or your light goes on, as long as it goes on. Part of our success story is now part of our challenge, because we have kept the lights on and we have kept industries moving and we have helped to keep houses warm. It means that people do not necessarily understand what this industry is doing in its contribution. We work hard, certainly with stakeholders like yourselves and with the media, to reinforce the contribution that we make and the benefits that we bring.

But there is a challenge. It is something that we are looking to raise the bar on as we go forward, because obviously people are increasingly interested in the climate change context. We see an opportunity there to be able to reinforce the positive aspects of this industry, to show that it is really serious about supporting the climate change challenges and that it is serious about working with others to come up with solutions rather than just problems.

Q335 **Douglas Ross:** Finally, Ms Cohen, we will come to you.

Colette Cohen: It comes down to a fundamental problem we have in that people think we are just about keeping the lights on or keeping your car moving. In actual fact, that is part of what we do. Even down to the clothes you are wearing and the teabags you use, the shampoo, your toothpaste, it all comes with a hydrocarbon base nowadays. If you want to move, there is a transition required, so this rhetoric, "Just keep it in the ground or close us down," is not realistic. I think it blurs the conversation. Even when you are trying to talk about new technology or an improvement or getting to net-zero, as our industry has been talking about, still you get people who are saying, "We will just shut you down. That is the quickest way to get to net-zero," but life as we know it would not even be close to continuing if we do.

There is a major obligation upon all of us to try to educate, but it is very hard if you are in the industry to be that voice because you just get the commentary of, "Well, you would say that." I have been involved in the onshore fracking side and it is a real challenge, because it is very emotive. I completely understand that, but you lose the ability to have a conversation around it. You have teachers who will not have the conversation, so you cannot get to the younger children to start educating about what energy is and what oil and gas does. There is an obligation there for all of us if we are going to have a just, healthy transition to a different future.

Q336 **Chair:** I am sure Deirdre and Colette will remember when we launched our last report, which I thought was very positive and said a lot of good things about how we transition. The basic point was we needed industry to transition from if it is going to mean anything at all. Some of the curious responses that we got, when people thought this was just another excusing exercise for the oil and gas sector, "But isn't the defining issue all about

new exploration and new drilling?" That seems to be the defining light when it comes to taking people with the sector or not. I wonder if you recognise that. I know you talk about conversations explaining fully what oil and gas does, but is there a recognition that that is the real fundamental issue here?

Deirdre Michie: Chair, if I can pick that up and others please come in. The whole exploration question has to be understood in the context of we need this industry to sustain the energy supply for the country, as per the Committee on Climate Change report. We could offshore everything; we could offshore the jobs, the emissions, the taxes paid, the security of energy supply if you so chose to. But if you do not choose to do that and you want to optimise that and make the most of your indigenous industry, you are going to need exploration to fill the hopper.

You need exploration because you have to find it. Then you have to develop it, appraise it and produce it so that you can have a sustained flow coming through that this industry can continue to produce. If you were to stop exploration tomorrow, you would bring forward the demise of this industry in a less managed way than we are proposing through Roadmap 2035.

Q337 **Chair:** I do not want to get into a big discussion about that, but I am just interested in your view.

Professor Underhill: If I can add something to that, Pete.

Chair: Very briefly, John.

Professor Underhill: Yes, I will. It is that exploration has almost stopped this year, that the individual exploration wells that were slated to be drilled have largely been deferred to next year. To get back to the main point of the discussion, the impact of Covid, it has basically stopped exploration in its tracks for 2020. That pushes the can down the road that much longer, for all the reasons that Deirdre has said.

Q338 **Jon Cruddas:** Thanks to all the participants so far. It has been a fascinating session for someone who knows very little about the sector. Given that, and given everything that has been said so far—and time is running on—I have a couple of open-ended questions to give you the opportunity to say anything that you have not said that you think might contribute to the report.

Given the 2014 response, the statement yesterday, the £62 million Government support package, is there anything more you think the UK Government should be doing to protect jobs in the sector in Scotland? Shall we start with Ms Michie?

Deirdre Michie: Thank you for the question. On protecting jobs today, I think back to my three-phase framework of the reflect, the recover and the accelerate. The UK Government's response, the package from the Chancellor, the previous one and the existing one, has been very helpful, as has both Governments working with us to keep the industry going.

I will reinforce the request for the asymptomatic testing as we move forward and through into recovery. Let me reinforce: in a recovery phase, the asymptomatic testing is very helpful, as would be the plugging and abandoning campaign proposal that has been championed by the OGA and also then deepening the work on the sector deal.

The other thing I would add is for both Governments to continue to champion this industry, to reinforce its positive role in the economy; that they see a future for us as an integrated part of a diverse energy mix is absolutely crucial. It is crucial to investment confidence, to people wanting to be part of the industry, to people joining the industry and staying in the industry.

The final thing is that we are looking forward to the publication of the White Paper by the UK Government, in which we are hopeful that the oil and gas industry will be a key feature. That is an important publication that needs to reinforce the role of our industry today and moving forward.

Q339 **Jon Cruddas:** Do any other colleagues want to say anything on that?

Colette Cohen: I support all of that, but there is also an opportunity. I know the P&A is important and it is about 52% to 53% of the cost of the decommissioning, but there are major opportunities in looking at reuse and repurposing of existing facilities. Getting clarity on that quickly would be very helpful.

Also it is looking at what we could do to bring more of that decommissioning activity to the UK, maybe going away from the heavy lifts into these small kind of activities to create more opportunity for the supply chain. I have said it already, but I think we need to be much more agile in our R&D investments. There are great opportunities here in the UK with industry support ready to go. We have a tendency to back one, and I think this is a major challenge into a whole new era for this. We cannot back one opportunity.

What we need now is the Government to back two, three, four, five projects and see what can succeed and how we can learn. Instead of asking them to compete against other, ask them to collaborate, share their learnings, drive forward as a proper collaborative and a nation that wants to deliver us that change. That is an opportunity in front of us. We are currently setting ourselves up to compete against each other, which is not for the good of the greater nation.

Q340 **Jon Cruddas:** John, do you want to jump in?

Professor Underhill: Yes. The key for me is about the crew change. We have been talking about this for years, that those who are more experienced in the industry are leaving it, they are leaving in droves—and the threat is there in the near future that that is going to happen—but, moreover, that the recruitment of the next generation is not necessarily going to follow naturally in the way that we might expect it to. We may have a shortfall in some skills and expertise. My concern is that this is an

industry that leads for Scotland, but in a worldwide context Scotland is a world leader in oil and gas and expertise in the subsurface. I fear that we may lose that competitive edge in seeing the deployment of technologies and expertise and experience across the globe in decommissioning, exploration, areas like carbon storage or hydrogen storage in the future, pipelines and infrastructure and so on. We are at a pivotal moment, and it is important to manage that.

Deirdre Michie: I do apologise. I am sorry for jumping back in, but I should have also put in my plea for the sector deal. I have said it before, but let me just make sure, for the record, that is another ask. The other piece is on fiscal stability. Having a stable, competitive fiscal environment is absolutely crucial to the sustainability of this industry. Sorry to add to my list. Thank you.

Q341 **Jon Cruddas:** Good, I think we got a lot on the record there. A final point is on the support available for the local economies or towns disproportionately affected by the sector's decline. Is there anything else that needs to be done for those specific communities?

Deirdre Michie: Maybe I should have waited, because this is my segue back to the sector deal. The sector deal will offer opportunity for the place part to be optimised. We talk about the energy transition zone that is being developed and then we look to be able to optimise that into other parts of the country. That would be an ask for support for the sector deal, recognising its particular contribution in that regard.

Colette Cohen: I would like to see an actual vision put out for the country. We are looking at something like a hydrogen power from shore project up in the Shetland Islands, which would potentially deliver hydrogen all the way through Scotland and into the UK. Wouldn't it be great if local communities wanted to be part of that, part of the jobs, part of the change but also part of the change in economy, that they wanted to have a hydrogen economy, distributed hydrogen in their regions? If we started thinking about what our nation wanted to look like and how we could participate, that becomes education, like proper education around what energy means to you, but also the job opportunities, the skills opportunities from very young all the way through to retraining of existing technicians and engineers that we have in our industry today.

It is trying to paint a clear, different future that everybody can get behind. We need that to bring communities on. It goes back a little bit to John's conversation about you cannot deploy new technology if they do not know why they should care about that new technology or why it is important for their community. That creation of a clear vision of what we want to be will be very helpful.

Professor Underhill: I come back to the perception that the career and the industry is extractive and fossil fuels and part of the problem. In fact, what we have to do is to demonstrate that we are the solution. In order to do so, we have to change that perception and become an attracter for

careers and young people. My ask would be to have funding to come towards trying to develop the education sector that allows people to see what oil and gas is about, the journey and the pathway it is on to net-zero, and to support things like doctoral training and other initiatives with the university sector that allow us to stop the haemorrhaging of numbers that are not taking this sort of engineering and STEM subject geoscience pathway into the industry.

It is an exciting opportunity for young folk to go on and do because it is going to be the technology that helps in meeting net-zero, the climate change targets and the UN sustainability goals. There is a fantastic opportunity in environmental science and so on. Are we getting that message across? I do not think so. Some funding to help would be good.

Q342 **John Lamont:** My question ties back to some of the discussion we have just had about reskilling and training. Thinking back to the previous session of Parliament when the Scottish Affairs Committee was in Aberdeen, one of the questions I put was about the possibility of redeploying staff who are currently involved in offshore oil extraction into the fracking industry. Clearly, there has been a policy change by the UK Government. The Scottish Government have their view on that. Is there a danger that because of the current policy of the UK and Scottish Governments on fracking, we are potentially losing skills or workers to other places in the world where that technology is still being used?

Colette Cohen: The interesting thing about the oil and gas industry is that it is a global industry and our skills are very transportable. It is always going to be one of the challenges. It is also one of the challenges in anchoring the supply chain in the UK as you get a major decline in the basin and if we do not have clarity of what we are going to do with the basin and what that future looks like. That is why I think it is so important to have an integrated energy strategy so that our supply chain can understand what their opportunities are. Then you absolutely run the risk of losing skills, investment, development and innovation.

The slight difference here is that we never created a real onshore fracking capability within the UK, whereas we did create that in other parts of the world. The kind of fracking we have done offshore can still occur in parts of the North Sea, so you are not losing those skills because that exists. I think if we had potentially built up that skills base and then shut it down, you would have had a greater chance of losing. What we have lost is the opportunity of understanding the potential of the formations within the UK because we stopped before we could do the full evaluation. We lost the opportunity, if that had been successful, of creating an industry that has been very successful in other parts of the world.

Professor Underhill: It is predicated, though, on that the geology has to work. The subsurface complexity of the geology in the UK is such that fracking was always going to be more challenged here than, say, in the US where you can have longer horizontal wells in order to exploit the resource that is available. The bottom line here is it is the geoscience and the

technology that goes to study it that is important and we have that expertise and skill here. If it does not work in the UK, as it has not, naturally some of those workers will go elsewhere.

But there is a bigger pool of talent that has worked on oil and gas extraction from the offshore and the opportunity there in storage and understanding the subsurface. The same skills of seismic interpretation, well log analysis, core description can be deployed to great effect for hydrogen and carbon storage and other aspects. There is a fantastic opportunity there where we would keep that skill but also export the knowledge base, that we will see people being able to use that and deploy it in other countries, thereby Scotland and the UK will lead.

Q343 **John Lamont:** Ms Michie, do you agree with the previous witnesses?

Deirdre Michie: I do. Excellent answers from both of them.

Q344 **Chair:** If we were to pursue a fracking programme, we start to get back into the territory of the publicity-related issues where there might be things taken up. I do not know if that is a concern or worry that any of you has about venturing down such a path, given the mixed response among the public on all of the concepts of fracking.

Professor Underhill: For anything that we do and say we have to have that social licence, so it is really important that we communicate the message. These are difficult challenges and we have to have a grown-up conversation with people, explaining what the different pathways are and the dependencies. Unless we do that, we will not be able to proceed and do any of the things that we have been describing here, including going on the journey towards geo-net-zero. People need to be taken with us on that pathway. It is clearly easier to do things offshore—it is sort of out of sight, out of mind—but onshore I think the challenges are enormous and potentially too big a hurdle to overcome.

Q345 **Wendy Chamberlain:** Thank you, witnesses, for your time today. First, apologies, I was in the Chamber so I missed the very start of the session. If I am repeating anything that has already been asked, I apologise in advance.

I want to touch some more on the industry looking to net-zero emissions. Ms Cohen, you mentioned earlier that the industry has moved a lot in the last year, but I would be interested to know your thoughts on how the pandemic has affected the industry's plans to move to net-zero and support the roadmap.

Colette Cohen: We mentioned that we have a slight delay on some of the existing projects. That comes in a number of forms. The first is because of some furloughed staff and not being able to access the people that you require in different companies. The second is getting access to either facilities or field trials, because we are trying to limit the number of people on assets, which is completely understandable.

We are seeing is a delay in the development of some of the technology. On the positive side, however, we are seeing a greater uptake of some of the technologies that enable a net-zero or towards a net-zero footprint, everything from predictive analytics to some of the approaches on logistics, to robotics and automation. The other part that is positive is the biggest interest we have from our stakeholders right now is in the projects that would make a step change in how they operate. It is the operatives looking for power from shore, partnering with the renewables, looking at, "How would we do blue hydrogen or green hydrogen? How would we look at CCUS?" Where we are getting the biggest interest is definitely in the areas that are driving towards net-zero.

The pandemic is slowing certain things, but it is also making them very aware of a different and new future. The conversation from the Government on investment or co-investment or derisking in that tripartite approach is about a green recovery. That is very positive from a technology perspective. We can try to drive the trialling and development of new technologies that hopefully will create a new opportunity for the UK to either own IP, manufacture or build in the next generation industry.

Q346 **Wendy Chamberlain:** Ms Michie, what are your thoughts on that, particularly in relation to the pathway to net-zero production emission targets and the impact the pandemic has had on them?

Deirdre Michie: Thank you for the question. While industry has been dealing with the challenges of Covid, we have also been continuing to work on the emissions programme. As I said earlier, we published Roadmap 2035 in September 2019, where we committed as a sector to being a net-zero sector by 2050 and to supporting the UK and Scotland through carbon capture and storage and through the development of a hydrogen economy. A couple of weeks ago, we published our report on how we are going to go back to delivering on our emissions commitment—reducing our offshore production emissions by 50% by 2030 and by 90% by 2040. We, as an industry, are very committed to doing that and we have been working in the background as we have been going through Covid. We got to the point where we have come out and said, "Here are our targets. Here is our forward plan," and now we start to move into action in delivering against those targets and commitments.

Q347 **Wendy Chamberlain:** My final question is to Professor Underhill. My knowledge of oil and gas—I do not represent a north-east seat—is because I worked for the military resettlement programme for two years and we had a lot of service leavers looking to enter the oil and gas industry. One of the things we are talking about in relation to building back better after Covid is the green recovery. You talked a bit, Professor, about what potentially higher education should be thinking about. What are your thoughts on how we potentially pursue a green recovery by thinking about skillsets or career transition, people, but also within schools, STEM and further education?

Professor Underhill: Great question, because I think you hit the nail on the head here. It is at all levels and to all parts of the chain that you have described. School children need to be attracted into knowing that science, that STEM is important. Those people—the constituents that you have described, the community you have described—need to see that retraining can allow them to go into the industry. We have an opportunity in higher education to try to set the agenda for the next generation with the skillset.

In addition, I would like to come back to the question that you directed at our other two witnesses. One of the drivers for industry is the environmental and social governance angle for net-zero. They are finding more and more that they have to demonstrate environmental, social and corporate governance in order to have investment in some of the projects they wish to deliver. There is a challenge there for many of them and shareholders also are asking questions about the commitment of industry, so there is a push and a pull.

The industry is being pulled in a direction to do net-zero and is making serious attempts to do so, as Deirdre and Colette have already said. That is very clear. However, there is also the push element from investors and private equity and so on to be doing something in this space. The coming together of those two elements means that there is a real opportunity within the UKCS to do something significant in this area.

Q348 **Wendy Chamberlain:** Absolutely. It is about applying that lens across everything we do rather than thinking about things like green issues, environmental and—dare I say?—inclusion and diversity, not in silos but thinking about them with a lens on everything that we do. Any final thoughts from the other two witnesses before I hand back to the Chair?

Deirdre Michie: On your comment about diversity and inclusion, I will reinforce that this is an industry that is committed to working on those areas. Colette and I certainly champion that vociferously. We set up a taskforce earlier this year to drive that agenda. I will say it again: a key part of the sector deal is to make sure that we drive the D&I agenda across all aspects of what we do.

Wendy Chamberlain: Lovely. Thank you very much.

Q349 **Deidre Brock:** John, you touched on carbon capture and storage and it seems that we have been talking about carbon capture and storage for an awfully long time in the UK. It seems to present opportunities for workers within the oil and gas sector, as has already been touched on by Colette, I think. Could you go into why you think it is taking so long to get these projects under way? There is certainly a lot of support for it in the environmental sector.

Professor Underhill: The key thing has been cost and commitment in the past. There was first the Miller project. You probably know Miller and the Brae cluster have high CO_2 naturally within them, so to get the oil and gas out, you had to have the chrome-plated pipelines that I mentioned before. That was an ideal opportunity and that, sadly, failed about 15 years ago.

Secondly, there was a competition where two proposals went forward, one called the White Rose project and the other the Goldeneye. Again, sadly, they did not get the investment.

Now we have a new opportunity to look at the way in which we decarbonise the big industrial clusters that face some of the depleted fields and the opportunity exists there. However, the costs associated with it and the technical challenge should not be belittled because carbon dioxide is a small molecule. Hydrogen is small and nimble and can escape when a long chain hydrogen will not. Equally, CO_2 reacts with water and becomes carbolic acid, hugely aggressive, hence the need for chrome-plated pipelines as well as seals, where hydrocarbons are inert. It is not a slam-dunk that the existing fields and infrastructure can be used. These are some of the challenges that have to be faced and the finances that go with that. The physics and chemistry behind these molecules are really important.

Those are some of the aspects that have to be addressed and understood in order to proceed, but it has largely been financial and picking the right sites. It would be terrible to pick the wrong site and then have leakage. We must make sure that the geology and geophysics stack up when tested in order that we pick the right sites that face the decarbonised clusters. Is that being done? There are certain areas of the North Sea—I have mentioned Brae, but there is the east Irish Sea as well—that have natural carbon dioxide within them, as do parts of the southern North Sea, but they are not necessarily the sites that are being looked at currently for CO_2 storage.

Hydrogen is a small and nimble molecule. There is a reason why no natural hydrogen accumulation has been found in 50 years of oil and gas exploration in the North Sea. It is a hard thing to store. The best place to store it is in salt caverns. We have those in Cheshire and Yorkshire and we have opportunities in the North Sea, but those are not necessarily the sites that are being looked at currently. There is a lot of work to be done in this area to get it right.

Q350 **Deidre Brock:** Do you think it presents a realistic opportunity for jobs within the oil and gas sector, the just transition that the Scottish Government is doing?

Professor Underhill: Yes, if it is done well and based on robust geoscience and technology and infrastructure, but that frontend piece has to be done. Sometimes people assume that because there is a field coming up to decommissioning and it is going to be handed over for CO_2 storage, that is done and dusted. What if that site is not optimal? We have to get this right. That demands all the skillsets I said before for oil and gas being deployed to understand, characterise and parameterise the subsurface and then the engineering aspect and well integrity aspect also being built in. Get the first bit wrong and, unfortunately, this will not get off the ground. Get it right and the opportunity that you describe will be there.

Q351 **Andrew Bowie:** I have two questions. The first one is for Deirdre. The Committee is working on its report on coronavirus and the four-nation approach. From your perspective, and for our report, how has the four-nation approach worked or not worked for the industry? Where there was divergence or a different timescale or different things being introduced—a different regime for testing, for example—are there any issues that might have been thrown up by that that the industry has had to face where we might learn, as parliamentarians in the UK Parliament, if we ever had to, heaven forbid, go down this route again?

Deirdre Michie: My response would be that we worked well with both Governments, as I said earlier. We worked really well with both sets of officials and we found them open, accessible and very supportive. When we raised issues or there was stuff that we did not understand, we were able to work it through with both sets of officials. From our point of view, we have had good support from both Governments.

Colette Cohen: I will answer that in a slightly different way in that there have been different rules. As we move forward into this new energy world, there are clusters all through the four nations. When we go forward, one of the things that you all, as policymakers or influencers, need to think about is ensuring that the rules and guidelines are consistent across the four nations if we are to make this cost-effective and easily transferable job-wise and technology-wise.

Q352 **Andrew Bowie:** You would probably describe it as more of a one-nation than a four-nation approach?

Colette Cohen: It is the rules and guidelines for the implementation of new technologies. We have already seen differences between renewables and us and we are having to clear that up to try to ensure that there is skills transfer. We need to make sure, as we move forward on these clusters and integrating the clusters and having a new vision for hydrogen, that the rules, guidelines and expectations are consistent.

Q353 **Andrew Bowie:** Professor Underhill, I will come back to you in a second. We have spoken about fiscal stability and how important that is for further investment in exploration in the North Sea, which of course we all want to see. Is it a given that we would also like to see some constitutional stability in the United Kingdom over the immediate future?

Deirdre Michie: That clearly is a question for the politicians and the voters, Andrew.

Q354 **Andrew Bowie:** Thank you, Deirdre. Professor Underhill, you wanted to comment on the four-nation approach.

Professor Underhill: I wanted to make a point about it is horses for courses. Hydrogen will be the thing for certain communities. I think of Orkney where that has been extremely successful. Ground-source heating might be important for an urban district's energy supply. For other parts of Scotland and the UK, we might need to be thinking more nimbly about

what works for a particular community, rather than it being one size fits all.

Colette Cohen: I did not mean for it to be one size fits all, John. I just meant the rules that we apply wherever we are doing it.

Professor Underhill: Absolutely. Sorry, I was not contradicting in any way what you were saying. I supported what you said, Colette. I was thinking of the additional point.

Q355 **Chair:** We try to do things through the Chair here. Thank you. We will not even get into the whole issue about leaving the European Union, of course, because that puts up another particular minefield, but thank you for that.

The last 10 years have been a pretty turbulent time for oil and gas. We had the boom in the early part of the last decade, followed by the very severe bust heading into Covid. Are you confident about the future of the sector? Where are we likely to be in 10 years' time? We discussed the transition to low carbon, into green jobs and retaining all the skills that we can. I want to get a sense of do you remain optimistic and hopeful that we are going to get through this and there will be a credible sector in 10 years' time? What will it look like, just very briefly? I will go around all of you to wind things up.

Professor Underhill: I think that we have to. We have to get this right. We will still need oil and gas in 2035 and beyond. However, we need to be mindful of the carbon emissions and net-zero, so in order to do that we have to be thinking about the technologies and the expertise that we need to bring to bear in the future. I am optimistic about the opportunity to build the skillsets for the next generation, that we can not only use in the UK to best effect but also export that talent and expertise to great effect on the global stage.

Colette Cohen: I agree. First, we are essential to this transition, so I am hopeful that we will be resilient through this difficult period. I have seen commitment from the industry and the supply chain to that transition. I hope that when we look back in 10 years we have more of an integrated energy approach, we have proven some of the technologies, we have our 50% reduction in emissions and are maybe even beating that, but that we also have a better vision for what our North Sea looks like, we understand which reservoirs we are going to use for CO_2 and which we can use for hydrogen, which facilities we can repurpose and how we can partner with the renewables across the North Sea and even potentially broader than the UK so that we are exporting our skills and our capability. I am hopeful, but I think more than anything because we have to make this work.

Deirdre Michie: I will build on that "have to". We are such an important sector in the contribution we make now, the skills we have and the role that we need to be playing in delivering net-zero, so the "have to" is absolutely key. We are a resilient and very adaptive industry, and we are committed to coming up with solutions. I am optimistic. It is challenging,

and I do not underestimate the challenge. We will need the support of both Governments, that they continue to champion us and support us and recognise the positive, constructive role that we can play and are willing to play.

Chair: I am grateful to all of you. Thank you once again for joining us at such short notice. It was a fascinating session, as it always is with stalwarts giving evidence at the Scottish Affairs Committee. I am fairly certain that in the course of this session of Parliament we will be returning to you and hopefully getting your assistance, support and help for other inquiries that we will be taking part in. But for today, thank you once again.