



Northern Ireland
Assembly

Committee for Infrastructure

OFFICIAL REPORT (Hansard)

Northern Ireland Hydrogen Ambitions:
Wrightbus and Ryse Hydrogen

11 November 2020

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:

Miss Michelle McIlveen (Chairperson)
Mr David Hilditch (Deputy Chairperson)
Ms Martina Anderson
Mr Roy Beggs
Mr Cathal Boylan
Mr Keith Buchanan
Mrs Dolores Kelly
Ms Liz Kimmins
Mr Andrew Muir

Witnesses:

Mr Buta Atwal	Wrightbus and Ryse Hydrogen
Mr Jo Bamford	Wrightbus and Ryse Hydrogen

The Chairperson (Miss McIlveen): A briefing paper can be found in members' packs. Hansard will report the session. The witnesses from Wrightbus and Ryse Hydrogen are attending via StarLeaf. We welcome Mr Jo Bamford, the chairman, and Mr Buta Atwal, the chief executive. Gentlemen, you are very welcome to the Committee. We had hoped to visit Wrightbus. That has not been possible due to the pandemic, but, hopefully, it will happen in the near future. If you would like to make your presentation, members will then follow up with some questions.

Mr Jo Bamford (Wrightbus and Ryse Hydrogen): Good morning. Thank you very much for welcoming us to your Committee today. I have probably met some of you along the way over the last year. It has been an interesting year at Wrightbus. Buta Atwal, who is with us today, has been fighting battles and fires and has had an interesting year.

What is happening at Wrightbus? *[Inaudible]* bankruptcy last June. When we took over the business, there were 45 people left in the business. Our first task was to *[Inaudible]* which is what we did. We got up to about 700 people towards the end of January. Then COVID hit, and we had to trim the business and cut our cloth according to the market. Then we opened again, and, hopefully, we will just about break even in our first year out of bankruptcy, which is good.

We are talking to you because one of the things that we have been pushing for in Northern Ireland is the creation of a hydrogen hub. There are two zero-emission solutions for the future: batteries and hydrogen. Batteries work on smaller stuff, and hydrogen works on bigger and heavier stuff. Hydrogen is predicted to be a £2.5 trillion market by 2050 and to have 30 million jobs worldwide. Why hydrogen over batteries for Northern Ireland? First, you have a bus company that makes a hydrogen bus. We also make a *[Inaudible]* bus. Secondly, China has a 73% worldwide market share for batteries and has

done a very good job with them. It also has a lot of the chemistry to make batteries in its supply chain, whereas Northern Ireland has a lot of wind and water, which are predominantly the things that make hydrogen.

I have been looking at hydrogen for 15 years and in great detail for the last three years. It is not expensive, and we can deliver hydrogen in certain locations for the same cost as running a bus on diesel. What is expensive at this time is the bus, which is twice as expensive as a diesel bus, but so is a battery bus. Fundamentally, that is where the main differences are. We make a battery double-decker bus, which, at best, will do 60% of the distance of a diesel bus and take four and a half hours to charge up. That is the case for all battery buses. Our first-generation hydrogen bus does 95% of the distance of a diesel bus, takes seven minutes to fill up and is 100% zero-emission.

Fundamentally, we are applying to the Northern Irish Government. We are asking not for a grant but for a loan under something called, I think, financial transactions capital (FTC), which is a commercial loan. We want that to put two hydrogen hubs in Northern Ireland. Why a hydrogen hub? If you want to be part of the hydrogen economy, you will need to make hydrogen, and no hydrogen is made on the island of Ireland. The first step is to make some hydrogen, and the other step is to get other products in the supply chain for hydrogen to invest in Northern Ireland. Those are the things with a hydrogen hub.

One of the other things that I would dearly like the Committee's help with is on the British Government's announcement in February of plans for 4,000 zero-emission buses. That has been slightly lost in the COVID thing, and I understand that. They have not pushed those 4,000 zero-emission buses even though they keep announcing them. I ask that you put some pressure on, in any way possible, to make that happen. If half of those buses were hydrogen buses, you would have the largest hydrogen economy in the world.

If you get hydrogen going in your economy, you would then start trying to drive that through the universities. Ulster University and Queen's University are very good engineering universities. If you can get hydrogen going in one area of the economy, you need to supply the jobs and bring the people through your economy to do that. Part of the hydrogen hubs would be about how we train people in Northern Ireland to go forth on this global adventure to see whether Northern Ireland can grab some of that big £2.5 trillion market.

Buta, would you like to introduce yourself and say what you are doing?

Mr Buta Atwal (Wrightbus and Ryse Hydrogen): Yes, no problem. I have met some of the Committee members. I am the CEO of Wrightbus and Ryse Hydrogen. The reason for the dual role is that Jo and I believe that there is a common approach to this. You cannot have the hydrogen without the bus and vice versa.

As Jo rightly said, we have developed the bus business back to a normal business in one year. We had our anniversary at the end of last month. In that year, even with the shock waves of COVID, we have stabilised the business and put forward a development plan that, next year, will look to spend £5.6 million in engineering costs to invest in hydrogen and battery electric. That whole operation will be stunted without the availability of gas, especially with our closest customer, Translink, with which we have a year and a half left of our purchasing agreement, and, in the Republic of Ireland, with the National Transport Authority (NTA), which has ordered three buses from us and has indicated a requirement of at least 20 to trial, but the restriction there is also the availability of gas. Putting forward the request for a full loan from the FTC fund for a hydrogen hub gives the advantage, as Jo rightly said, of allowing us to sell buses to Translink, the NTA and further afield. More importantly, it also develops a hydrogen culture in Northern Ireland. Jo mentioned the level of investment. If you look at Germany, France, the UK, Portugal and Europe-wide, you see that investment there will be up to about £96 billion over the coming five years. Northern Ireland would be well placed technically to start attracting some of those opportunities, as well as having the skills base and the knowledge that can attract companies.

I will give you an example of that. Jo put me in touch with a company. I will not give you its name, because it is still an early conversation. They contacted me and said that they are a refuse truck manufacturer that has had enquiries in the UK, and they asked whether we would help them and maybe even manufacture some of their refuse trucks for them. Those types of enquiries have started to increase. Jo and I have been approached a number of times. We have explained that we have the factory space and would happily use some of that space to encourage further operations. If there was a hydrogen hub, which we call an enterprise zone, that would absolutely attract businesses of that

type, but without hydrogen in volume on the island of Ireland, it really restricts our opportunity and future opportunities for the region.

Mr Bamford: May I just make two further points? For 12 months, we have been pushing for a hydrogen hub in Northern Ireland. In the meantime, Germany has said that it will spend 9 billion on hydrogen, France 12 billion and the European Union up to half a trillion, over the next 10 years. In GB, six hydrogen hubs are starting to get going. It would be a shame if we had to go somewhere else because we could not get it going in Northern Ireland, because Northern Ireland is perfectly situated for it. It has wind, water and great universities that have the right skill set. If we do not get somewhere in the next six to eight weeks, we have to start to look at all the other places that are chasing us to go and put jobs in their market.

Secondly, on the 4,000 zero-emission buses that the Government have announced, half of those could be hydrogen. Wrightbus has 500 employees now, but, when Wrightbus was doing a thousand buses a year, it had over a thousand employees. If Wrightbus somehow managed to get 1,000 or 2,000 of those zero-emission buses, we could have a lot more jobs in Northern Ireland. Whatever pressure could be laid upon the Government in GB to help on that front would be fantastic, and whatever pressure could be laid on the Government in Dublin would be fantastic too. We are doing our bit, as a business, to try to sell those things, but I am sure that there is a political angle to it. That is your sphere. You are politicians, and we are business people. You operate in the world of politics, so, with whatever help you can give, we will be delighted to do more here in Northern Ireland.

The Chairperson (Miss McIlveen): Thank you very much, Jo and Buta. As a Committee, we are very engaged in the issue of the decarbonisation of transport. Numerous questions have been asked in the Chamber, across a number of Departments, because this is clearly a cross-departmental commitment and a project that would need buy-in from Economy, Infrastructure and Finance. You said that these are conversations that you have had over the past 12 months. I know that a number of members will have been involved in those conversations. I assume that you have had those discussions with Ministers. Can you give us an update on the engagement that you have had and whether it has been positive?

Mr Bamford: We have had positive engagements. We have spoken to Minister Dodds and to Minister Mallon. There have been a lot of words, but action is now needed. That really has not been forthcoming. I am saying, at this time, that we would be delighted to invest more in Northern Ireland. We would be delighted to borrow some money to get this going. I think that we kind of need action in the next six to eight weeks, because other places such as Aberdeen and Tees Valley are currently pursuing us very heavily. Those places would like hydrogen in their economies. We made a commitment, a year ago, to come to Northern Ireland, and we feel very responsible to the people in our business. We would like to do more there to build that up as a hydrogen hub. Action would be helpful, if possible — if I can say that without being too rude.

Mr Atwal: We have had meetings with Finance Minister Murphy, transport and Infrastructure Minister Mallon and, obviously, the Economy Minister, Diane Dodds. Minister Dodds visited our site. Everybody understands the need and has expressed positive sentiment that a hydrogen hub for Northern Ireland is important. They all understand the jobs benefit, and they all understand that what we are asking for will encourage more investment in the territory.

In the middle of the COVID crisis, we have adjusted our request. We were originally asking for direct government funding to support this. We have adjusted that because we appreciate that there will be demands on the government purse. So, we have moved it to a request for a loan from the FTC fund, which complements our investment in Wrightbus. That investment is many millions, as everybody knows. That loan is so that, as a commercial operation, we can deliver a hydrogen hub at commercial rates under the terms of the FTC fund.

They have listened to us, and we have listened to them. Having listened to them, we have put in a very commercial bid, and that will be hitting their tables very soon in the report that we are doing. Obviously, we will give the Committee a copy of that report, and we would appreciate the support of the Committee to develop the hydrogen facilities in Northern Ireland, so that we can encourage jobs and other industries into the region.

The Chairperson (Miss McIlveen): Just to be clear: at this stage, you have not actually submitted your bid, but that is a work in progress.

Mr Atwal: We submitted an initial report about hydrogen and the hydrogen hub. We are now modifying that report to make it easier for the FTC fund to be awarded as a loan rather than as a government subsidy.

The Chairperson (Miss McIlveen): You said that your business will be restricted without the availability of gas. What, then, is the potential impact on jobs if you have remodelled your business around hydrogen?

Mr Atwal: Historically, our two largest customers have been Translink and the NTA. Without hydrogen on the island of Ireland, North or South — currently, there is very little hydrogen on the island of Ireland — the opportunity to sell hydrogen buses is very limited, which has a direct impact on jobs.

The Chairperson (Miss McIlveen): Where are the sites that have you identified for the hubs?

Mr Bamford: Two sites have been identified. One is in Belfast harbour. The difficulty with hydrogen is that you have to marry up supply and demand. The one in Belfast harbour is next to a big Translink bus depot; therefore, it would be easy to get it to Translink. Another point to make about harbours is that one of the next products, probably around 2024-25, will be hydrogen ferries. The first six or seven of them are being built in Norway. We think that that hub will be perfectly positioned for Harland and Wolff and its harbour-type stuff. Having hydrogen production there would be great.

The second hub is in Ballymena, because we have a factory there and, around our factory, there is a lot of empty factory space. When talking about a hydrogen hub, that would be a great place to try to incentivise — that is probably more for you, the Government, to do — others in the supply chain, whether those are businesses making hydrogen refuelling stations, hydrogen vans or rubbish trucks or any other parts of the economy. I would be trying to drive them into that, so having a hydrogen hub and central place where they can use hydrogen would be great.

You would then try, I suppose, to get local universities involved and the local job force to start to be trained around those hubs, so that they could go into those businesses if you could incentivise them to come into your territory.

Mr Atwal: We have had conversations with the harbour and Mid and East Antrim Borough Council, and both complement some of our activities. Recently, the council announced investment for Ballymena that is hydrogen and green energy-related, and the harbour is actively looking to redevelop.

The Chairperson (Miss McIlveen): You have partially answered my last question, which was in relation to the broader decarbonisation of transport, looking at ferries and haulage companies and so on as well. In the document that you sent to us you referenced a "hydrogen academy". How will all those things link together, and what broader discussions have you had to make it a reality?

Mr Bamford: The way hydrogen works is this: over the next 10 years, various products will, potentially, be on the market. Today, buses are ready. To get hydrogen working, you have to marry up supply and demand, so you look at which products are coming on the market and when. You then have to look at the demand for hydrogen.

Buses are ready today. As I said, hydrogen trains will probably start to come in in 2022 and hydrogen ferries around 2025. People are talking about rubbish trucks. Hydrogen trucks will start to come in around 2026-27, if I am correct. I have spoken to most product groups to understand where their engineering processes are and when, they think, they will start to become commercialised.

At the moment, the only thing that we can be in control of is what we have in our portfolio, which is a hydrogen business and a bus business. The thing with hydrogen is that you have to start somewhere. You cannot do it all at once. If you start with the bus business and have a hydrogen hub, I will then help you find other people in the supply chain and drive them into Northern Ireland. It would be great for us to do that. Government and some others in the supply chain need to be driven there. I would also get the universities to talk to them about how they supply people for the jobs and train them. There is a whole programme involved, not just that one thing.

Mr Atwal: We are fortunate that Jo and his family own a separate business. We have been talking to them about hydrogen over the past few months. Our engineers are at a very advanced level. They are leading the way and taking the other company forward.

We have, through our commercial negotiations, agreed some very good deals, which, again, are helping. Design-wise, we are far more advanced. That also helps. Northern Ireland is in a very good position, with our universities, Wrightbus and our knowledge, to take real advantage of the hydrogen economy. As I said, we have been approached by a number of companies already and have talked about some collaborations and about how those companies come from further afield into the region. Without hydrogen, however, all of that is just words, because it is very difficult for us, as Wrightbus, to run our operation. We are currently being charged a phenomenal amount of money just to fill up our buses to test them for hydrogen. It is not the commercial rate that we are paying right now. We really should be paying a quarter of what we are paying. That is because there is no commercial hydrogen on the island of Ireland. That is becoming a real bottleneck for not only our conversations and future plans but, more importantly, the day-to-day operation of Wrightbus.

Mr K Buchanan: Thank you, Jo and Buta, for coming along. You have not come along, but you are present anyway. What would the sites that you referred to, in Belfast harbour and Ballymena, look like? I mean not physically but the process. Can you give me a quick rundown in layman's terms of the chemistry involved in the production of hydrogen? How many employees would be required on either site?

Mr Bamford: Very simply, we propose to make hydrogen using a process called electrolysis. Let me keep it quite simple: our water is H₂O, which means that you have two H dots, which are hydrogen, and one O dot, which is oxygen. You put electricity into a membrane. When you hit it with water, it splits the water into hydrogen and oxygen. We then put the hydrogen into the bus. The bus is basically an electric vehicle. In fact, it has the same driveline as a battery bus, but, instead of lugging around 3-5 tons of batteries, you are taking a gas around. You have a hydrogen fuel cell, which was invented in Wales in 1842, so it is not new technology. In the fuel cell, you have another membrane. The H dots hit one side, the O dot hits the other side, and, as they recombine, they create a lot of electricity, which drives the vehicle, and water comes out of the exhaust.

What does a site look like? It looks like some shipping containers stuck in some boxes inside a shed on a production site.

Mr Atwal: The site itself contains three main elements. One is a transformer, which brings in electricity. The second part is an electrolyser, which does the chemical reaction that Jo talked about. The third is a compressor, which compresses the gas, ready for shipping to the relevant location. It is covered by a rudimentary shed. We normally paint it in the colours of the local area so that it merges.

Sites are on a single level, so they are not very high. They are slightly more broad than they are high. They do not really occupy too much space. The locations that we have seen — the Translink site, if we were fortunate enough to get that order, and the Ballymena site — are more than adequate for the production of hydrogen.

Mr K Buchanan: How many people would be employed at the Belfast site, for example?

Mr Atwal: If you look at the construction phase, through to operation and distribution, you are talking over 100 people a site for just that phase. As Jo quite rightly says, Wrightbus currently sells approximately 400 buses. In its heyday, it sold 1,000 to 1,500 a year. The additional benefit would be that you would see the doubling or trebling of the workforce at Wrightbus. All in all, you are talking 1,000 to 1,200 jobs in the industry, not including those that result from further investment in places such as the universities, secondary and tertiary suppliers coming to support that process, and other vehicle manufacturers and organisations that want to use the resource, technical knowledge and infrastructure of Northern Ireland.

Mr Bamford: Let us put it simply: the case for getting started is that it would mean 100, 200 or 300 jobs. Again, if we were to get up to 1,000 or 2,000 buses a year, Wrightbus would add a lot more jobs. The European Union predicts that there will be 30 million jobs in the hydrogen industry by 2050 and that it will be a £2.5 trillion market. You have to start somewhere, and the best place to start is with buses. You have got Translink, which is a customer. You have got Belfast harbour. You have got our hydrogen business and our bus manufacturing business. You have got supply and demand tied up there, and that would be a great place to start. You then have to backfill up and down the supply chain to get those companies into your economy, and then you can export around the world. It is exactly what China did with batteries 10 years ago. The reason that it has 73% of the market share for batteries globally is because it did this: it got it going in the home market, turned the volume up there

and therefore got the lowest cost base. Once you have the lowest cost base, you can export around the world.

Mr Atwal: One of the job opportunities that people fail to realise is the design/development jobs that would come out of this. They are high-quality, high-value jobs. We are fortunate in Northern Ireland to be leading the way with hydrogen technology. Queen's University Belfast and Ulster University are doing some great work, not just to develop engineers but to do simulations of bus routes etc. Wrightbus has a history of doing engineering work with hydrogen. It is now probably leading the way. You can see people coming in, and that may be to our detriment at Wrightbus, because they will probably poach some of our people. That intellectual economy is not just of high value but of high worth.

Mr K Buchanan: I have one final question. You made a lot of points there. Where does the hydrogen currently come from for Translink buses?

Mr Atwal: It currently from Energia. The capacity, however, is for only around six buses for the trial. We have had a number of meetings with Translink to talk about how, as a bus manufacturer, we can support it and how we can work with it to see how we can produce gas. A tender is happening currently to provide gas. We are obviously applying for that tender. What we are trying to do is to put in a tender from our current sources, which are in England. Economically, it would be a lot better to do that from Northern Ireland.

The Chairperson (Miss McIlveen): Thank you. Ms Martina Anderson is next.

Martina is not there. We will move on to Andrew Muir.

Mr Muir: Thank you very much, Chair. I declare an interest as a previous employee of Translink.

Thank you very much for your presentation. Many of the questions that I had have already been adequately covered. I have just two points to make. I am very supportive of the proposed investment. We need to be ahead of the curve in Northern Ireland. We need to be able to support the new technologies that you have outlined. Why are you asking for FTC rather than commercial borrowings? My next question is to ask what the impact of Brexit potentially will be on your operations.

Mr Bamford: This is the difficulty with politics. We know that there is a need for a hub. FTC is a commercial borrowing fund. We have tried to put it to government to get some funding for the hub. Ultimately, asking for FTC probably seems the easiest route to go down. If you can tell me a better route, I am very happy to listen. We have probably an eight- to 10-week window. Other Governments in other areas have announced a lot of money that is going into hydrogen. They have not put up the money yet, but they will do, probably in January, February or March. That is when Germany's hydrogen plans will come to fruition. We therefore need to get on with it quite quickly, and, apparently, FTC is the route for doing that.

How do we see Brexit? Look, my friend, Brexit is a political thing, and it is up to you guys. As businesses, we have to operate in whatever environments there are and try to find our way through them. Brexit may or may not cause some complications. It depends on what deal you guys do. We will then have to figure out how that applies to us as a business. I know that that sounds as though I am ducking the question, but I do not really know what the deal is going to be. I therefore cannot tell you how it is going to affect us. But, you probably know a little bit more, because you understand it better than me.

Mr Atwal: Brexit is already costing us money, because we have to look at different import/export duties. It can potentially limit our operations to the EU. Until a deal is done and we know the details, it is very difficult, as Jo absolutely rightly says, to estimate what benefits or problems Brexit will cause. We have to prepare, and we have already started incurring preparation costs.

I will go back to why we are looking at FTC. Jo has already invested quite a lot of money in Wrightbus. To get a commercial loan for the electrolyser/hub, we need to put some money into that side of the business as well. We are going for FTC because we want the whole amount. We want the Northern Ireland Government to understand the total level of investment that we are putting into the region. We could reduce the growth of Wrightbus by investing in a hub, or we could invest in Wrightbus. We need more than we are putting in. The best route for getting the whole amount is the FTC fund. We will take on the hub as a commercial operation, run it and drive it forward efficiently in order to grow the

production of hydrogen in the territory. With the level of investment that we are putting into it, that will grow Wrightbus and have further benefits for the rest of the economy.

Mr Bamford: Commercial lending does not lend itself very well to new pieces of kit. It is difficult to get commercial lending for an electrolyser at this time, because there is no secondary market. If you finance a car, the recourse for that finance is the bank. A bank does not want to give recourse today for an electrolyser, because there is no secondary market, but, as soon as you get this going, there becomes that secondary market.

The other part of the job split is that developing financing around the hydro economy is going to be of huge benefit. Companies such as Ulster Bank, which my family has been dealing with since 1974 — it does our JCB finance — are the sorts of companies that could figure out how to finance these things going forward. You have to start somewhere, and that is why a government loan makes absolute sense in this scenario.

Mr Boylan: Thank you very much for your presentation. I am sorry that I was a wee bit late, but I have read the presentation that you provided to us.

Jo, not everyone has a cabinet like the one behind you. I like the look of some of the vehicles in it. I have a couple of points to make. I have been up to Wrightbus in the past, and we have seen the great work that it has done. I remember some of the buses that it did for the American market way back in the day. It employed a lot of people, and I wish you success with the new venture. A lot of Committee members are keen to find a new way forward through the use of greener technology. We would certainly support the use of hydrogen, but I want a wee bit of detail on the level of demand for hydrogen and electric vehicles. How has that demand grown over the years? Which has seen more demand?

Mr Bamford: At this point, the technology for electric vehicles is perhaps a bit more advanced than hydrogen technology, but, as we move forward, part of the problem with big and heavy stuff is that it does not work very well with batteries. Let me use an extreme example. If you wanted to run a Boeing 747 on batteries, you would need 2,700 tons of batteries, so it would never get off the ground. The bigger and heavier you go with batteries, the more problematic it becomes, and that is why using hydrogen for buses is interesting. As I said earlier, a battery bus does 60% of the distance of a diesel bus, whereas a hydrogen bus does pretty much the same distance as a diesel bus and operates in the same manner.

It is easier to start doing battery vehicles, because you can plug a few of them in, but batteries do not work at scale very well, so, when you start asking, "How do I power all the cars in the UK?", the answer that you will get is that you would need three times the world's yearly lithium output to power them all and you would need to triple the grid over the next 30 years or else spend £300 billion on it. The problem with batteries is, as your business start growing, the grid becomes the issue, whereas hydrogen basically operates the same as oil and gas does. You can make it at a wind farm on the coast, stick it on a truck, drive it to a filling station and fill up vehicles there. Oil and petrol are made at a refinery and stuck on a truck to a filling station, where vehicles can fill up. Hydrogen does not work very well when you do two or three buses, but, when you do a fleet of 200 or 300 buses at a time and plan for it, you can make the cost the same. You can get there for the same cost, and it can operate in the same manner, and that is ultimately what we want to do. Fundamentally, the most difficult thing to change is human behaviour, and my view on that is very simple: when you get something to cost the same and do the same, and vehicles are as easy to fill up as with the incumbent, you will get mass adoption.

Mr Boylan: In the overall market, what is the percentage use of electric and hydrogen versus the rest? We all want to move away from the use of fossil fuels. Have you looked into that?

Mr Bamford: Around 500 battery buses were done in the UK in the past two years and perhaps 60 or 70 hydrogen buses. Since we have been pushing this over the past six to nine months, stories have come out from Germany and elsewhere, and, as such, enquiries to us about hydrogen have gone up massively. The reason for that is this: if you are bus operator and you have a plan to decarbonise your entire fleet over the next 10 years, a battery bus will do only 60% of the distance. That means either that 40% of your fleet cannot be operated by battery or that you need 40% more fleet. Hydrogen will therefore be a large part of the market, because 40% of the market cannot be done by battery.

Mr Boylan: I will tie my final two questions together. I want to know about fuel costs, infrastructure and everything else that is involved in the two technologies. What is the difference in the costs? We touched a wee bit on fuel tanks, mileage covered and all of that. What challenges will you face to being part of the market in trying to roll all of this out? Buta, feel free to jump in if you want to respond as well.

Mr Bamford: Fuel costs depend on where we are at the time, but we can make the fuel cost similar to that of running a bus on diesel, although it will depend on how close you are to the production facility. What is not the same price at the minute is the bus. Battery buses and hydrogen buses are twice as expensive as diesel buses. We have done an exercise, however, and, with a singular manufacturer producing 3,000 hydrogen buses, we think that we could get a hydrogen bus to cost the same as a diesel bus. With a bit of volume, you can bring the cost down. For instance, that is less than 10% of the UK fleet. Buta, I am sure that you have stuff to add.

Mr Atwal: Yes. Let us be clear that we, as Wrightbus, are investing in battery and hydrogen technology, and that is because we are a business that looks after customers first and foremost. We were talking to one customer very recently about how hydrogen would work for it, and it very quickly came to the conclusion that batteries cannot do what hydrogen can do but that hydrogen can do what diesel can do. Why would you therefore have electric buses? Why not just have hydrogen buses? The only reasons that you would not have hydrogen buses is, first, because of the supply of gas not being readily available and, secondly, because of the cost. Cost comes down only when there is volume. By having opportunities to produce gas, and that gas then becoming available, the volume will increase, and the price will drop accordingly. We have done modelling for that and believe that, with over 2,000 buses a year in the market, price parity with diesel, or a price that is close to parity, is very quickly achievable. We have spoken to our suppliers and to the industry, and we believe that the reduction in costs is very viable. As I have said, however, what is needed is a supply of gas that encourages that volume.

Mr Bamford: By the way, although there is a market for batteries today, if we continue with batteries, we will not be in business five, six or seven years from now. That is because China has the cost base and supply chain for batteries, and, in the longer term, we will not be able to compete with Chinese battery buses.

Mr Boylan: Can you quickly clarify a point for me? You answered a question earlier about Belfast harbour and Ballymena. Would you need any extra infrastructure? What would be the turnaround time for the production of hydrogen and electric buses to get them out on the road?

Mr Bamford: The infrastructure is the same for batteries and hydrogen, so you probably have to plan from 18 months out. We have a planning department and a construction department. If there are charging stations, you have to have to figure out whether you have enough power coming into the depot and how that power comes in. You have to go through a planning process for that. For battery buses, planning is therefore done from 18 months out, and it is the same for hydrogen buses. Of course, the thing about hydrogen in this scenario is that you have to plan from a little bit further out, because you need a production facility for it. It probably takes us 18 months to build a hydrogen production facility, and I would be looking at putting a hydrogen filling station into a depot in about 12 months, depending on how long the planning took and all that jazz. It takes probably 12 to 18 months to put the same charging infrastructure into a bus depot, and you also have to figure out how to upgrade the grid and get in a grid power station etc.

Mr Atwal: To me, the point that Jo has just made is one of the key points. The infrastructure, whether for battery or hydrogen, takes over a year to install. That is a limiting factor for the growth of Wrightbus, because you have to wait for over a year before the market is ready for your product. The longer we have to wait to make these decisions, the more we constrain the growth of Wrightbus.

Mr Boylan: What about costs?

Mr Atwal: The costs of the infrastructure?

Mr Boylan: Yes.

Mr Bamford: It depends on which infrastructure you are doing, but the costs for battery or hydrogen infrastructure are roughly similar.

Mr Atwal: It depends on grid availability and the location of the hydrogen relative to the customer. All in all, however, as Jo rightly says, the costs for either are very similar. We need to look at what is best for Northern Ireland. Northern Ireland has an abundance of wind and water, and it has got great communications to its key cities, so hydrogen can work very well in Northern Ireland and in the Republic of Ireland.

The Chairperson (Miss McIlveen): OK. Thank you.

Mr Beggs: Hello. Thanks for your presentation. I had not realised just how fast hydrogen fuel cells were being developed. I noticed that, just this month, Hyundai has signed a deal to sell 4,000 fuel cell trucks to China, following on from the 16,000 sold to Switzerland, so this is definitely a growing area. The hydrogen hub seems to be simply a hydrogen production facility. Is that the key aspect of it? What will it cost? How many trucks or buses will it be capable of powering?

Mr Bamford: We are talking about two hubs, potentially, costing roughly £20 million each. They do about 200 buses each. The first step in the process at the production facilities is to make hydrogen, and then you have to drive the rest of the economy around that. Hyundai and Toyota both believe that hydrogen, and not necessarily batteries, is the future of motive power. I know that they are doing batteries, but they have been pushing hydrogen for quite some time. These are part of the economies, and these are companies that get it right a lot of the time. In fact, China stopped subsidising batteries at the beginning of this year and started subsidising hydrogen to get it going in the home economy. What you have just seen, with Hyundai selling loads of trucks to China, is China starting to get the volume up in its home domestic market and therefore get the cost down. Whoever gets the cost down so that it costs the same as diesel and operates in a similar manner will have the massive export opportunities that this economy can have. You are right: Hyundai and Toyota are leaders in this. Would it not be great if Wrightbus could export its buses around the world because we have a hydrogen economy in our home market and lots of people who, having been trained up through the universities and the schools, can go around the world and drive the business and drive jobs in the local economy?

Mr Atwal: To give the commercial aspect, Japan has decided that hydrogen is its fuel of choice, above battery electric. Wrightbus sold its first five touring buses to Japan just recently. Those are currently diesel buses, but you can quickly see those being hydrogen buses and there being the basis to export further afield than mainland England, Scotland and Wales, to mainland Europe and burgeoning economies as well.

We are in a great position right now, because we at Wrightbus are ahead of the curve with our technology and with our design and development team, which is punching above its weight, to be fair, because of its skill and expertise. We can, however, quite quickly lose that advantage, because there is and has been a lot of investment recently in not just European countries but Japan, Korea and, more worryingly, China. That will not only hurt us in the future but potentially affect our growth as a business.

Mr Beggs: Am I right in saying that, unless there is a hydrogen production facility on the island of Ireland —. The cost of importing hydrogen is very prohibitive, certainly in the growing phase, because it is such a volatile gas and costly to transport. I take it that it cannot go on ferries, so how does it get here at present?

Mr Atwal: Not because of its volatility; it is a safe gas to travel, and there are very clear safety measures around it. Certainly, it is a lot cheaper to transport a gas if it travels a mile than if it travels 400 miles and over a ferry. That cost makes it viable for the short term, but, for the long term, it is uneconomic. You want the source as close to the usage as possible. That is why the hydrogen hub is so vital for us.

Mr Bamford: Yes. I will add to that. Look, we have our noses slightly ahead of these other economies by six or eight weeks. However, they will soon start putting real money into those things. They already have hydrogen being produced in those countries. If we do not get it done in Northern Ireland fairly quickly, we will have to go elsewhere. We have to go where the market is. It would be delightful to have it in Northern Ireland but also Southern Ireland, because Europe is going to be a main market for us, and it is very easy to then go down —. Hopefully, if we get the right political decision, you will allow us to go down across the border and access the European market rather wonderfully, and we can sell

buses around the world. At the moment, we also have enquires on hydrogen buses from Australia, New Zealand and Chile, and there are ones going into Madrid. Those are not ours yet, but that is what we would like to do. We would like to be exporting all around the world.

Mr Atwal: One final point is, by having hydrogen, we are helping people with the planning of hydrogen infrastructure and the bus. We changed our DNA from a bus provider to a solutions provider, which adds real value to our sales pitch. We can do more and attract more custom that way. By only selling buses, we are competing in a very savage market which the Chinese or whoever, with battery buses, are trying to undercut quite substantially.

Mr Beggs: Finally, are you linked in with Queen's, which has a history of engine design etc, so that our research and development progresses?

Mr Atwal: Absolutely. Bamford Bus has sponsored Queen's. JCB has recently started that process as well and is investing in Queen's. We have engineers there who help us with not only the design of the bus but the modelling of routes and how a hydrogen or battery-electric bus would suit a route and more. It is not only Queen's University but Ulster University. The universities in Northern Ireland are excellent engineering universities that are well equipped to support the growing hydrogen economy.

Mr Beggs: Thank you.

Mr Hilditch: My question was about Queen's; Roy just got in before me. Previously, in the Department for Employment and Learning, there was a unit sponsored by Wrightbus in relation to design, research and engineering.

Mr Atwal: That has transferred to Bamford Bus.

Mr Hilditch: Yes. Further from that, then, you mentioned, in the construction and getting up and running, around 100, 200 or 300 jobs. Have you pinned down any details on the supply chain and what is available in Northern Ireland?

Mr Bamford: Really what we are saying is that, if you get the volume up in your home market, you drive the supply chain to come and put their factories around your factory. At the moment, there is not a huge supply chain for hydrogen specifically in the local Northern Ireland market. There are great students at the universities. There are great people, and that is what you could do. You have great financial institutions. However, the supply chain in hydrogen is probably five or six units, whether those are fuel cells or hydrogen tanks. These things are still quite nascent. The biggest fuel cell manufacturers in the world are in Canada, funnily enough. However, if there was a big enough market in the home market, they would probably come here as well. I imagine that you, as politicians, will be trying to incentivise those people to come into the market. Look at the other things that are made in Northern Ireland, such as the Terex crushers and screeners. Crushers and screeners will not be able to work on batteries, because the batteries would have to be too big. So, ultimately, those are things that will go for hydrogen. If you can get a number of those things going on hydrogen, why would you not try to drive a supply chain to come and invest in Northern Ireland too? It is on the border of Great Britain and Europe, so it is perfectly situated. It has great universities, loads of wind and loads of water. This is the opportunity for Northern Ireland to grab hold of at this point in time.

Mr Hilditch: You were not able to put any figure on the bid for the loan as such? You were not able to describe how that would look?

Mr Bamford: We are putting in that bid this week for the FTC loan, but it is up to £40 million. If you want two sites, we will do that and borrow that off you and then drive that into the local economy. I urge you, at the same time, to have your own plans for what other parts of the hydrogen supply chain you want in Northern Ireland. I am very happy to introduce you to all of those and for you to try and drive those into the economy. If you get it going in one area, you should drive up and down a supply chain in your economy to get as much of that in your own place. That is what first-mover advantage is. It is what China did on batteries, and now it has 73% of the global market share on batteries. It owns most of the supply chain and most of the chemistry. It has a fairly unassailable lead when it comes to batteries. At the moment, no one has claimed that on hydrogen. It is going to be a large-scale part of the economy. If nothing else, you should be trying to drive the wall of money from Europe that will go into it over the next 10 years into your own economy. Whoever takes advantage of it, you will want to drive as much of it and get as many jobs in your local economy.

I rather love manufacturing and I have grown up in it, but it is normally the mainstay of a tertiary town. It is not normally in capital cities. It is normally that mainstay in that town, and it will be there for a long time. When it goes, as happened with Wrightbus, the town will die. The great thing about it is that if you get this going with hydrogen, off we go. The market is going to grow. A very simple example is that there are two manufacturers of hydrogen refuelling stations in the world today, but Europe is going to put in half a million of those over the next seven years. Those guys do not have the capacity. Why could we not design one in Queen's University and put it into a factory in Northern Ireland? You could do that. Those are the things that are waiting to be grabbed hold of. I am trying to do my little part of it, but there are other entrepreneurial people in Northern Ireland who would want to be part of that supply chain, and that is what I would be trying to drive if I were the Government.

Mr Hilditch: I have other questions, but I will finish with this one as we are tight for time. You have been very upfront with us today, but, playing devil's advocate, if the bid was not successful, what would that look like for Wrightbus and Bamford Bus moving forward? What would the future be like without hydrogen development?

Mr Bamford: Without hydrogen development, we would struggle. We are going to make a battery bus, and that will be great, but China is doing more battery buses than any other country in the world, and it is starting to export them around the world. Again, China started on the battery scenario 10 years ago, and it has the lowest cost base. We have a window in the next three, four or five years to do battery buses, but ultimately, when it comes down to a battery, we will never be able to get the cost base for that to go. So there will be a problem on that. If we do not do hydrogen in Northern Ireland —. I am a businessman so I have to go where the market is. I do not really want to go and live in Germany, but it is going to start investing massively in it, and that is, ultimately, where you have to go. So what are the consequences for Wrightbus? We will still have Wrightbus, but you have to go where the market is. I do not want that to sound harsh; I just have to be very practical about it. I am really sorry.

Mr Atwal: The key point is, why not hydrogen? It is the best technical solution. It is very similar to diesel with regard to its operation. It is zero-emission. Northern Ireland has natural resources that produce hydrogen very easily. The cost is very similar to battery electric, and, technologically, we are ahead of the curve. It is not a case of why we should do it; it is why we should not do it. It is the only answer that we can see, for a technological reason, that replaces diesel quickly, easily and practically. I will give you an example. A depot has a person on a night shift who cleans a bus, fuels it and gets it ready for its day operation. A battery electric bus would mean that that person would have to change shifts, probably to a day shift, because the charging has to go across the whole day. Hydrogen would mean that that person can still work on a night shift, probably go home, take the children to school, sleep, pick the children up and then go back to work. That type of human emotion is very easily forgotten. As we all know, the bus industry has come out of very unionised, set ways. Changing all of that would be very difficult. Why would you want to change it? It works, and hydrogen allows it to continue to work.

The Chairperson (Miss McIlveen): Thank you. Ms Anderson.

Ms Anderson: Thank you. Can you hear me?

The Chairperson (Miss McIlveen): Yes, we can.

Ms Anderson: Something has been wrong with my signal for part of the day. I captured most of the presentation. Jo and Buta, I really appreciated hearing how you outlined all of it.

I am conscious that you are very aware of the wind and water opportunity for, potentially, the island of Ireland. I live in the city of Derry; we live cheek by jowl with Donegal. You highlighted what the EU intends to do with the €500 billion that it is going to invest. You talked about access to the island of Ireland in terms of the South of Ireland. Obviously, the protocol gives you that; hopefully, as we move forward, no damage will be done to that. You mentioned the skills capacity and improving R&D. I was glad that one of my colleagues picked up on the point about working with the other universities. Ulster University has a school of engineering, and I am conscious, being in Derry, of the link between Derry and Donegal. Magee university and the Letterkenny Institute of Technology work in a very collaborative way. I present that to you as an opportunity when you are building capacity. Have you looked at the north-west? Have you talked to, for instance, Magee as a university campus of Ulster University? Have you had any conversations with Magee about its relationship with Letterkenny? The school of engineers is incorporated into its portfolio.

Mr Bamford: We would be delighted to come to the area and for you to introduce us to all of those people. I think that this will give you lots of jobs in Northern Ireland, and they will be spread across Northern Ireland. There is a wonderful inter-Ireland thing. Bear in mind that Buta and I have come in recently; it is quite a political place, but, if you think about it, it would be great to have a North/South thing. The Minister for Transport down South is from the Green Party; that would be great to drive those two things. You would also have access to a European market and some way of merging those two. I will leave it up to the politicians, but I would like free trade between North and South; it would be great if we could do that.

We would be delighted to come and see your particular area and work our way through it. In time, we could have another hydrogen hub there; that is not a problem.

Ms Anderson: Consider that job done; I can definitely make that connectivity link for you and Buta to link with Magee here in Derry. It is about looking at creating the opportunity for clusters of companies. You talked about that in both your presentation and the material that you sent to us. It is about seeing, from your perspective, whether there is enough connectivity and synergy between the Department for Infrastructure and the Department for the Economy to ensure that the centres of excellence for hydrogen buses, or hydrogen, will be taken forward in a way that will advance the opportunities to create clusters of companies, or whether more needs to be done. That is where we can effectively come in as a Committee.

Mr Bamford: Like I said, there are a couple of things that could be done. I am not going to step into the world of politics between the two different things. I am just going to say that there is not a lot of time before money goes to those other plans, whether that is Tees Valley, Germany or Aberdeen. When their money starts hitting, that is when all those companies will be going to those areas, because it is real. It needs government money to get it going, a bit like wind did a number of years ago. There is only so much that people can do by putting their hand in their pocket. I am saying to you that there is an opportunity for Northern Ireland and that you are perfectly positioned at this point. However, it needs to happen fairly rapidly, otherwise the opportunity goes. That is not a threat; that is just the reality of where it is.

The other opportunity, if you are going to put pressure on, is this: in February, the British Government announced a plan for 4,000 zero-emission buses. They have announced it every month, but there is no money for it yet. I know that everyone is lost in the world of COVID, but if you put that pressure on, and if half of those were hydrogen buses, we could make those in Northern Ireland. That is 2,000 hydrogen buses over the next four years. I would add probably another 200 to 300 jobs very quickly to meet that demand. That is something from a government point of view, whether that is the First Minister or deputy First Minister — that is your world of politics. Whoever can put that pressure on, we would be delighted to make as many of those buses in Northern Ireland as we could. If you could help on that, that would be very helpful.

Ms Anderson: Just listening to you and reading the material that you sent, you are not being political; you are being practical. The synergy that takes place in the Executive is because you have five parties working together. When that does work, that is where you can find that opportunity, so do not feel that you are putting your foot into some kind of political territory that can be challenging. Obviously there are differences on the constitutional question, but that is not what you are engaging in today. You are being practical and flagging up opportunities, so let us see what we can do individually and collectively to help that along.

Mr Bamford: Thank you.

The Chairperson (Miss McIlveen): Thank you, Jo and Buta. That was an interesting presentation and has given us a lot of food for thought. We will certainly follow up on some of your requests, and hopefully we will get to meet you again in the not-too-distant future.

Mr Bamford: Thank you all very much for your time today. We look forward to doing more in Northern Ireland and would be delighted to do more.

The Chairperson (Miss McIlveen): Thank you very much.