

TRANSCRIPT

STANDING COMMITTEE ON THE ECONOMY AND INFRASTRUCTURE

Inquiry into electric vehicles

Melbourne — 8 November 2017

Members

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Witnesses

Mr Stuart Nesbitt, Climate Change Technical Officer, and

Ms Sue Vujcevic, Manager, City Strategy and Design, Moreland City Council.

The CHAIR — The committee is hearing evidence today in relation to the inquiry into electric vehicles, and the evidence is being recorded. Welcome to the public hearings of the Economy and Infrastructure Committee. All evidence taken at this hearing is protected by parliamentary privilege. Therefore you are protected against any action for what you say here today, but if you go outside and repeat the same things those comments may not be protected by this privilege. I invite you to address the committee for 5 or 10 minutes, and we will then open it up to questions. Can I ask you to start by stating for the record your name, position and suburb?

Mr NESBITT — I will start off myself. Thank you for the opportunity to actually speak today. Stuart Nesbitt is my name. I am the climate change technical officer working for Moreland City Council. My role in the organisation is primarily to identify and initiate projects to reduce the council's carbon footprint, which tends to be buildings, public lighting and fleet, hence the electric vehicle role.

Ms VUJCEVIC — I am Sue Vujcevic, manager of city strategy and design at Moreland council, so I am responsible for the environmental sustainability team and setting up the policies to help these types of initiatives to happen in local government.

The CHAIR — Thank you. Over to you for 5 or 10 minutes and then will come back to questions.

Mr NESBITT — If I go over just let me know, but what I have done here is cobble together a presentation. We have delivered a lot of presentations about our role in the low emissions or electric vehicles over the years, so I just put together a few slides to sort of give you an overview of what we have been doing in this space.

I will start off by going through our transition to a zero emissions fleet. Moreland has long been renowned for its strong stance on climate change and environmental sustainability initiatives. We have been working aggressively on carbon reduction projects since council adopted a carbon management strategy back in 2010. As I mentioned before, there are three main areas of focus for council's operations being buildings, public lighting and fleet. Having achieved significant reductions in the buildings and public lighting areas our focus in this presentation is the fleet operations.

What that is all about is that as part of council's sustainability journey we understood the need to reduce emissions from our fleet operations, which represents around about 20 per cent of total emissions. We believe a key element on the path to a zero emissions fleet is the adoption of alternatives to internal combustion engines and their gross inefficiencies. This fact often gets lost in the debate over biofuels, where even if they can be sustainably sourced you are still effectively wasting about 75 per cent of the energy in the process of converting the fuel to motion, whereas electric vehicles can operate anywhere up to 85 per cent efficiency. Most importantly we recognised the urgent need to take action to address the devastating environmental and social impact the combustion of fossil fuels is having on local communities and the natural world. The science is telling us we need to transition now, not in 10 or 20 years time.

So with the knowledge gained through various studies commissioned by council and the ongoing research by technical officers we drew the conclusion that electric drive trains powered by renewable energy sources are the key to a zero emissions fleet operation, and more specifically that renewable battery electric vehicles will likely fill the majority of the personal transport space and fuel cell electric vehicles will likely fill the majority of the commercial transport space on a path to zero emissions. Of course EVs allow an easy transition to renewable energy to power our mobility and transportation methods.

So the starting point for Moreland's transition to zero emissions was to participate in the Victorian government's EV trial back in 2012 and get an understanding of how EVs might operate in our fleet. Moreland's participation in the Victorian government trial was one of the more successful. The Nissan Leaf operated in council's pool fleet for about six months and staff training was introduced to encourage participation. The EV was the most popular pool vehicle by a margin of 2 to 1 and covered more than 15 000 kilometres over the six months — one of the highest of any vehicle in the government trial. To understand the impact of introducing EVs to staff we conducted a pre-and post-drive survey to gauge reaction to the trial, which received high praise from the Victorian government as potentially a useful piece of research that might be used in their final report.

Following the participation in the trial council's ESD unit submitted that EVs would provide a positive environmental cost-benefit outcome if operated in council's fleet. So the council executive called for a more detailed analysis and so Pitt & Sherry were commissioned to produce a comprehensive feasibility study in 2014,

and this study is available on the council's website. The study looked at a wide range of issues but key criteria was a direct life cycle cost-of-ownership comparison between a hybrid Camry, which at the time was considered a baseline vehicle in council's fleet, and a Nissan Leaf. The purpose of that of course, following a successful trial, was to understand the pros and cons of operating EVs in council's fleet and to receive some professional evaluation. It was also to promote the environmental benefits to the community and business and local government sector.

We believe it is a corporate responsibility for all tiers of government to feed the used vehicle market with more fuel efficient, sustainable vehicles, and of course to demonstrate leadership. Moreland already enjoys a reputation as a leader in the EV space with the first EV fast charger in Victoria and hosts one of the largest number of public EV charging stations provided by any council in Australia. We hope this leadership will have flow on effects with other sectors, community, government and business.

Visual presentation.

Mr NESBITT — So the key focus areas of the study were these titles I have pointed out here. The report confirmed that offsetting the emissions from EV over internal combustion engine vehicles was more cost-effective and less complicated because it can be achieved directly using renewable energy. Just for your information, Moreland has been an end-cost carbon neutral organisation since 2012; peak oil — so the need to reduce our dependence on predominately imported fossil fuels for transportation to reduce the risk of supply chain issues affecting council's ability to provide its services to the community; and of course the price signals that people or influencers will ultimately continue to increase the cost of fossil fuel.

Local air quality was a really important one. It identifies a significant benefit of large-scale use of EVs in high-density urban areas. It was important that we aligned the growth in EVs with the growth in renewable energy supplied grids to ensure carbon neutral operation and also that you are not shifting the problem elsewhere.

A bit of food for thought for that particular thing: earlier this year the Clean Air and Urban Landscapes Hub operating out of Melbourne University published a report, and the report concluded:

Air pollution due to vehicle emissions is estimated to have caused 1715 deaths in Australia in 2015 — greater than the national road toll in that year.

So that is a really telling factor. Then of course operational savings, electricity costs, can be controlled with on-site renewable energy production and bulk purchasing contracts, whereas fossil fuel prices cannot be controlled and will progressively rise as peak oil and global supply and demand factors weigh in. Then there is reputation and leadership. As I said before, council enjoys an enviable reputation in the EV space and is regularly referenced by government and industry leaders as being at the forefront of the EV advocacy.

A quick one here: this is some of the criteria for the EV study. I will not go into great detail, but essentially what Pitt & Sherry found was that even with the higher cost of the EV, when you look at the downstream operational costs — so the criteria was looking at the total cost of ownership — the EV, over a three-year or 60 000-kilometre ownership cycle, returned a positive net value of 1.4, indicating a sound investment. Of course that has impacts of supply and demand. As EVs become more popular and become more aligned with the price of conventional vehicles, obviously that is going to weigh in more heavily.

We have successfully operated EVs in council's fleet. We started that in 2013, immediately following the trial. The one vehicle on the left there you can see actually sports livery to promote EVs and supports council's NCOS accreditation. It is sort of like a mobile billboard for council's environmental credentials. The car is still the most popular vehicle in the council's fleet. We find that staff actually prefer to use EVs over other vehicles. It is quite amazing how staff have embraced the EV culture. We currently operate four EVs in the fleet, with a commitment from council to add two additional EVs annually as a gradual transition to a zero emissions fleet.

I might just add on that point that we would actually have more EVs in the fleet right now if you could actually buy them. What we have found is that over the last two years where we potentially could have had three or four more EVs the manufacturers were not offering those vehicles because some of the ones that were made available earlier in Australia had been pulled from the market because of poor sales of the series 1s. That is some of the stuff that obviously you will be looking at with this study as well.

With the support of the Victorian government's EV trial as a stimulus, EV charging networks have been established around the municipality. As I said, we have one of the largest number of public EV charging stations owned and operated by a council in Australia — that is six public stations and five private for the future of council vehicles. It was important for council that all Moreland stations were available free to use with 24/7 access as part of our EV advocacy, encouraging early adopters. A further two quick-charge points are currently under construction as part of a community facility development in Pascoe Vale. Of course that included our sort of trump card — I should not say trump card, should I? — and that network included the first EV fast charger installed in Victoria. We dubbed it ZapnGo! to give it a little bit of flair. EV owners have been known to travel across town to use this particular station. They find it convenient to quickly top up for the return journey. I guess what it is is a precursor to what really needs to happen as far as the infrastructure is concerned.

Mr LEANE — Is that for free?

Mr NESBITT — It is free, yes. A little bit of trivia on this one. The first person to officially use the first public EV fast-charging station in Victoria was actually a Melbourne tram driver, an early adopter of EVs, who happened to be in the area with his Nissan Leaf and just happened to check his smartphone app to find a station that had gone live 20 minutes earlier, even though it had not officially been launched. There you go. That trial also included partnering with the Victorian government, ChargePoint, GoGet and Toyota. Council was asked to host two plug-in hybrid electric vehicles to assess the feasibility of operating EVs as a car share service. The trial was also seeking to assess the feasibility of a business — in this case, council — sharing a vehicle with the general public to improve the viability of the service. The trial was so successful that it continued beyond the official end date, July 2014, with Toyota providing the vehicles for an extended period in order to gather more data. The trial essentially verified the likely benefits of lower emissions car share opportunities.

You probably might be aware of this one, but on our heavy transport space council are developing the first commercial-scale 100 per cent renewable hydrogen refuelling facility in Australia. This is to focus on our heavy vehicles, which are basically the meat and potatoes of corporate emissions; they represent the majority of those emissions. The project has been successful, with \$1 million funding support from the Victorian government under the New Energy Jobs Fund. In a world first, the Australian-built fuel cell waste truck called an ACCO ZE will be developed by CNH Industrial at their Dandenong assembly plant — that is a project — and pre-production prototypes will be operated in Moreland's fleet prior to a production offering.

The project signals the beginning of a transition away from fossil diesel-powered heavy vehicles, and other councils have signalled their intention to follow in Moreland's lead. It is important to note for context with this inquiry that fuel-cell electric vehicles are also EVs, and Moreland's position is that we need both battery electric and fuel-cell electric vehicles to provide the diversity required to transition away from all forms of mobility currently utilising fossil fuel-powered internal combustion engines.

I threw this in for a little bit of context. A lot of people wonder whether electric vehicles are a relatively new idea — well, maybe not. Henry Ford's collaboration with Thomas Edison produced the first production electric car in 1914. That is an actual photo there. You have got a Model T with big lead-acid batteries in the boot, and that was a production version then. There are a lot of conspiracy theories going around as to why it did not take off and the internal combustion engine car did, but the consensus is it had much to do with very powerful and influential people that discovered this black goop oozing out of the ground. Of course the main reason we are revisiting the electric car now is the devastating effect that all that black goop has caused the environment over the past 100 years. Of course the Achilles heel of the EVs was energy density, so improving mobile power storage technology was always going to be the key, and of course we are seeing that now with batteries and fuel-cell technology.

Just finally, I thought this was a good thing to throw in. This was a statement that I got out of a report written a few years ago by a consultant which exposes the barriers we have traditionally experienced in advocating a move for lower emissions in the transport sector. I mean, how often do you actually hear, 'It costs too much'? What this report pointed out is that when comparing EVs powered by renewables with fossil fuel internal combustion engines, you need to compare apples with apples. So in effect when making comparisons between two modes, you have to carry out that assessment using what they call well-to-wheel methodology and not purely operational economics. When you do that, you realise the fossil ICE derivative inflicts significant environmental damage over its operational life compared to the renewable-powered EV, and that damage comes with downstream costs to the environment and human health so it must be included in any business case.

That sort of emphasises the point earlier. The Clean Air and Urban Landscapes Hub's report found this year that the elephant in the room is what damage those emissions are causing to the environment and human health. It is something that unfortunately we are not focusing so heavily on.

So what I thought I would do is provide just a couple of slides to wrap up. When we were asked the question, 'How do we stimulate growth in zero emissions vehicles?', the points that we have listed there are to recognise that market-based mechanisms and policy levers such as incentives and rebates are needed to stimulate growth. Coming back to that point before, operational economics alone is a flawed model because it does not consider the downstream impacts of the combustion of fossil fuel, and we see evidence of this in a similar space in Europe and the United Kingdom, where they have actually had some success.

One thing I would like to raise on this point: it was this time last year I was having a discussion with one of the manufacturers that is selling the very few EVs in Australia, and at that point in time they were actually making the decision on whether or not they would actually bring the series 2 model of a particular plug-in hybrid to Australia because the series 1 had sold so poorly. But at the same time they were umming and ahing about that, that particular vehicle was the biggest selling plug-in vehicle in the UK, and when you compare the two precincts, you find that a lot of the measures that I am sure a lot of the people you are probably talking to as far as this inquiry is concerned are recommending are the sorts of things that were employed to try and stimulate growth in those areas.

The second one is to introduce a regulatory framework that rewards or penalises vehicles based on their ecological footprint — essentially a low emissions incentive. That comes back by 74, and when you do a total well-to-wheel methodology, the costs upstream and downstream of whatever mobility iterations you are going to choose actually really need to be included in both those studies.

Then of course all tiers of government demonstrate leadership by operating the lowest emissions vehicles in their fleets. One of the reasons — and my background is actually in the automotive industry many, many years ago before I became an environmentalist — is we need to recognise that all tiers of government in Australia actually have a big impact on the used vehicle market. We call it corporate responsibility to make sure that we feed that market with more responsible and more fuel-efficient and low-density vehicles.

Moreland are co-signatories to a submission that has been lodged by the nine northern councils in Northern Alliance for Greenhouse Action, so what I thought I would do was just list the key points that were outlined in that study and also mention too that we were contributors to and co-signatories to a ClimateWorks report that was released — I believe you are speaking to ClimateWorks as well — and also a submission to the Federal Chamber of Automotive Industries on recommendations on plug choice for electric vehicles in Australia. If you like, I will just run through these things and just read them. You can see them on screen so —

Ms HARTLAND — If we could just have a bit of time for questions as well.

Mr NESBITT — Yes, sure; absolutely. Would you like to just go through those questions now?

Ms HARTLAND — Yes, maybe we could do that.

The CHAIR — Yes, we have only got 10 minutes left for questions.

Mr NESBITT — Okay, for sure.

The CHAIR — What is the cost? How much is council spending on this project?

Mr NESBITT — EVs? Okay. Because we have —

The CHAIR — The entire project: yourself and the vehicles and the publicity and promotion and the whole box and dice.

Mr NESBITT — As a package it would be hard to gauge that. Essentially what that report that was commissioned back in 2014 that pitt&sherry delivered said to us was that there is a benefit-cost ratio that says it is a good business decision to actually start introducing the vehicles to your fleet. Obviously the seed funding that we got from the Victorian government as part of the EV trial was a stimulus for council investing in additional charging stations, and that has become the norm for us now. As I have said, we have got a new

facility being built now, and the cost of introducing that EV charging infrastructure is actually built into the overall capital costs of doing it, because we now see that this is what we have to do whenever we do new infrastructure.

Essentially the charging infrastructure was already there because it was basically part of, or a remnant of, the EV trial, and we added to it out of capital expenditure. Typically, depending on which type of infrastructure you went for — this was basic level 2 — it was around about, say, \$5000 for a dual charging point. They were all set up on council property, so there were no issues as far as leasing land was concerned, and all set up where we had an existing lead-in supply, so we did not have to actually put in new electrical infrastructure to do it. But the cars came on as a normal purchase under a business case that you would normally do for purchasing vehicles.

The CHAIR — A ballpark figure? How much do you think council has spent on this project?

Ms VUJCEVIC — Two cars, firstly, per annum — \$60 000?

Mr NESBITT — Yes. And up to this point, including the cars, probably \$150 000.

The CHAIR — Thank you. I am very familiar with Moreland, and there are a lot of cars in Moreland. I go down Sydney Road quite often, and I know for a fact that that is a very, very busy road. What benefit is this going to bring — a few EVs from the council on the council payroll, as it were — when the municipality itself is absolutely chock-full of cars? The Hume council, the Moonee Valley council, the Darebin council and, I am sure, a few other councils around there are not doing anything like this either, so what benefit will this actually bring?

Mr NESBITT — I guess what it is about is leadership and advocacy. A few cars on their own? Not a great deal. But what it is is a community organisation stepping up and saying, 'Here's something we prepared earlier. Everybody can do this', and if everybody does it, then it will make a significant difference. I guess that is the main reason. I mean, if we look —

Mr FINN — Is there any sign that others are following?

Mr NESBITT — Well, slowly. As I said with that hydrogen project, it has had quite a lot of media and it has got quite a lot of a profile. We have got the neighbouring councils such as Hume, Darebin, Banyule, which have signed a letter of support to say, 'Build it and we will come'. That is an example of somebody stepping up to the plate and other people indicating 'Yes, we will get on board and make it worthwhile'. So I guess that it is what it is really all about. If we broke it down and said, 'Okay, what are the prime reasons for councils doing this?', the number one priority would be to reduce emissions. As I said, on its own it is not a great deal, but when you can stimulate interest within the community, within the neighbouring local government authorities and all tiers of government, history is littered with examples of where starting points have become the next big thing, and I guess that is where we see it.

Ms HARTLAND — On the issue of the truck, you have one currently in the fleet. How many trucks does Moreland operate altogether?

Mr NESBITT — Just for clarification, we do not have one in the fleet yet. This is a long-term project that we have been working on for two and a half years. We have recently signed a project development agreement with a consortium that we took to the government to seek assistance under the New Energy Jobs Fund. So we will not see a truck until probably early 2019, because that development needs to occur over a period of time. We operate north of 270 diesel vehicles in our fleet. To give that some context, the trucks that we are focusing on for this project are the waste trucks, because of our 20 per cent corporate emissions which come from fleet, 60 per cent of those emissions are generated by only 18 of those 270 vehicles, which is waste collection.

Ms HARTLAND — So the average council would operate between a 200 and 300 fleet.

Mr NESBITT — Yes.

Ms HARTLAND — Do you know how many people it takes to build one of these trucks?

Mr NESBITT — Our consortium is actually working on figures. Basically one of the things they are also working on, as a stimulus as a result of this project, is to set up a potential manufacturing hub in Dandenong to

bring the fuel cell and what they call type 4 tanks to Australia for production. The key to the whole thing has been the fact that we have got a global heavy vehicle manufacturer involved as the lead in the research and development. It is an Italian-based operation, but global. Of course they have got that manufacturing plant in Dandenong. There is potential.

Ms HARTLAND — Considering the job losses in the automotive industry, if you look at every council across the state and then at replacement, this could be a major job creator as well?

Mr NESBITT — Absolutely, and this is one of the considerations in the application that we put forward to the New Energy Jobs Fund. That was something that the government indicated to us was a very high priority as far as the project was concerned because it does have those flow-on benefits. You have got to remember that we are talking about a truck that has only ever been made in Australia for an Australian market out at that Dandenong factory for 45 years. It is actually still the same cabin; it has just been prettied up on the outside to try and make it more palatable to compete against these European derivatives. But it is an opportunity to continue the production of that vehicle, because it is kind of rebirthing it. All of a sudden it becomes the first-in-the-world production version of a current model. Coming back to your point about the flow-on effects to other councils, that particular model basically fills 70 to 80 per cent of the current waste vehicle market in Australia. It is not just councils; it is also the larger waste management companies that actually run that vehicle. So the flow-on benefits of developing that vehicle, proving the concept in Moreland's fleet and then having a production version available for anybody to purchase are very significant.

Ms HARTLAND — Thanks for that. In relation to charge points, there are six public charge points in the City of Moreland. Do you know how many people are using them on any one day?

Mr NESBITT — Yes. Those six public charging stations are through ChargePoint, and as a station manager I have a portal that I can access. I looked at it just last week. Since it was commissioned in 2013 it has dispensed 34 megawatt-hours of electricity and around 7000 charge-ups or visitations. That includes council vehicles as well, which is really good, but it is only operating at around 3 to 5 per cent of its capacity.

We did a report to council last year. They wanted a report on how it was progressing since we adopted the free offer. Essentially when we gave them the report on the activity we all agreed that we are pretty much in the early adopter stage, because EVs have not really been collectively embraced yet by the community, for a whole bunch of reasons that you see in the submissions you are receiving. So the council committed to retaining that free offer until the network operates at at least 20 per cent of its capacity, and on current trends we cannot see that happening for probably another three to five years unless there is stimulus that changes the culture.

Mr LEANE — Thanks for helping us today. I just want to ask you a few technical questions, and being an electrician I am going to pretend that I already know the answers. This is for the purpose of our public record. At the charging stations what sort of voltage comes out of the lead?

Mr NESBITT — If it is a level 2 station, it is 240 volts, and if it is a level 3, it is 415, three-phase, which is then converted into DC.

Mr LEANE — I am just wondering: with the charge station — and I suppose this is part of people's concerns and other council's concerns around scallywags playing with them, being out in the public, and a voltage coming out off the lead — at the end of the lead that you plug into the car what sort of voltage are we talking about coming out of the charge station?

Mr NESBITT — Well, 240. One thing to remember though is that with those plugs there are five different derivatives. One of the reasons why we countersigned the submission to the Federal Chamber of Automotive Industries is to try to say that we need to standardise plugs. But they all come with pilot plugs, so an extra low voltage signal, and until that signal is received by the station there is no power at the plug. Essentially you do not get power until it is literally plugged in.

Mr LEANE — So it is not like a lead that has been plugged in to a power point in the house and is dangling.

Mr NESBITT — No. On top of that, and as you probably know, AS 3000 requires an RCD back at the supply point. But the stations actually come with internal protection as well.

Mr LEANE — Yes, I do know that — under AS 3000.

Mr NESBITT — There you go!

Ms HARTLAND — He was a sparky.

Mr NESBITT — Yes, I can tell.

Mr LEANE — I see that there is work being done for a hydrogen-fuelling station, with some funding from the state government and support from others. What is the difference between an electric vehicle that you would have in your display and a hydrogen-fuelled vehicle?

Mr NESBITT — Think of hydrogen as stored electricity, because hydrogen does not occur naturally. It is in that, but you have to separate it from the oxygen. Basically, to simplify it, we install a large solar system, we harvest stormwater and we feed those two resources into an electrolyser, which separates the hydrogen and oxygen. It takes the hydrogen away, compresses it and stores it, then you transfer that to a vehicle. In the vehicle, you have a hydrogen fuel cell. A hydrogen fuel cell electrochemically converts the hydrogen into three elements: electricity, heat and back into water. The reason it is important for heavy vehicles is because it is a much more complicated process than just taking an electron and putting it in a battery, so there are inefficiencies downstream. But the advantage that comes with it, particularly for heavy vehicles, is its power density.

If we were to use, say — and we have done these calculations — Tesla battery technology and put enough batteries in these garbage trucks to actually make them do exactly what the diesel ones do, we would increase the tare weight of the vehicles by 2 tonnes. That is several thousand bins less a day that we could pick up. But we can do it with hydrogen for the same energy density and the same duty cycle and reduce the tare weight of the vehicle. The second advantage is that you can transfer electricity in the form of hydrogen from a stored tank to a vehicle at 60 kilowatt hours a minute, and so the refuelling time for such a large amount of energy is about the same as it is for diesel. They are the two advantages and the reason why we are choosing to use it for the heavy vehicles.

Mr LEANE — This will be the first of that type of refuelling station, in a couple of years time?

Mr NESBITT — Commercial scale. There is one in Sydney, but not commercial scale.

Mr LEANE — Therefore your submission is that this is an opportunity for other councils to embrace your way forward, because as you said, for the heavier vehicles it does not stack up with the standard like, say, Tesla?

Mr NESBITT — Sometimes it does, but in this instance it does not. That is the reason we are choosing it.

Mr LEANE — That is great. Thanks so much.

Mr NESBITT — One of the important points with that is that that station will include a public refuelling facility on the council site. The main target for that is the other councils with their waste vehicles, but more specifically buses — public transport. It is already a bus corridor and so buses are very much on our mind as far as sharing that technology.

Mr LEANE — These are zero-emission as well?

Mr NESBITT — Yes. Basically you are creating the energy using renewables and the only by-products in that process go back to water — just water vapour — so it is zero emissions.

The CHAIR — Thank you very much for your evidence today. We do appreciate it. You will receive a transcript in two or three weeks, so if you could have a bit of a proofread of that. I am sure there will be nothing wrong with it at all, but if there is, just let us know and we will take the appropriate action. Thank you very much for coming in today.

Mr NESBITT — Thank you for your time.

Witnesses withdrew.