

# TRANSCRIPT

## LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

### **Inquiry into Nuclear Prohibition**

Melbourne—Friday, 14 August 2020

*(via videoconference)*

#### **MEMBERS**

Mr Cesar Melhem—Chair

Mr Clifford Hayes—Deputy Chair

Dr Matthew Bach

Ms Melina Bath

Mr Jeff Bourman

Mr David Limbrick

Mr Andy Meddick

Dr Samantha Ratnam

Ms Nina Taylor

Ms Sonja Terpstra

#### **PARTICIPATING MEMBERS**

Ms Georgie Crozier

Dr Catherine Cumming

Mr David Davis

Mrs Beverley McArthur

Mr Tim Quilty

## WITNESS

Mr Bart Wissink.

**The CHAIR:** I declare open the Environment and Planning Committee public hearing for the Inquiry into Nuclear Prohibition. Please ensure that mobile phones are switched to silent and that background noise is minimised. I would like to welcome members of the public who are watching this live broadcast, and I would like to introduce my colleagues on the committee: Mr Meddick, Mr Limbrick, Dr Bach, Ms Bath, Ms Taylor and Ms Terpstra, and I believe Mr Hayes is about to join us shortly and some other members may be joining us throughout the hearing. I would like to welcome our witness for this session, Mr Bart Wissink. We really appreciate that you are giving us your time today, and we have got your submission as well, and we are looking forward to your contribution shortly.

All evidence taken at this hearing is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject to the provision of the Legislative Council's standing orders. Therefore the information you provide during this hearing is protected by law. However, any comments repeated outside the hearing may not be protected. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament. All evidence is being recorded. You will be provided with a proof version of the transcript following this hearing. The transcript will ultimately be published on the committee website.

We have allowed 5 minutes or thereabouts for opening remarks. We have received your submission, and thank you for that. So if you want to make whatever points you want to make, any opening remarks, then committee members will ask questions. We have got this session from now to 1.00 pm. So, Mr Wissink, we are all ears.

**Mr WISSINK:** Okay. Well, I will just read my submission quickly through. On carbon emissions, I think we all agree on the need to reduce our carbon dioxide emissions. Power generation is a large part of our carbon emissions so we really need to move our power generation to a low carbon emissions source. The European Union has been discussing and considering a carbon border tax for all goods entering the EU. We therefore must be looking at the lowest possible carbon emitters.

Much has been discussed of the hydrogen economy and there are current suggestions of plans for methane reforming. If we are looking at minimising carbon emissions, methane reforming is not acceptable. We would have to rely on a power-hungry electrolysis where 55 kilowatt hours produces 1 kilogram of hydrogen, with a specific energy density of approximately 40 kilowatt hours per kilogram. Then we need to add the energy required to store in either liquid or under pressure or in some other form. The advantage of electric cars is accepted; however, how are they to be charged and where will the power come from? Rooftop solar panel? The car will need to be charged overnight.

I have given a summary of life cycle greenhouse gas emission intensity from various technologies. Lignite, or brown coal, is the worst. Then at the bottom of the line we have nuclear at 29—that is tonnes of CO<sub>2</sub> equivalent per gigawatt hour—hydro-electric at 26 and wind at 26. Now, if we look at the above table we should be considering either nuclear, hydro-electric or wind only. For solar PV, carbon emissions from manufacture are too high. Basically it depends on the way that they are manufactured, but the mean carbon emissions there are 85 tonnes of CO<sub>2</sub> equivalent per gigawatt hour. We have a capacity factor for nuclear of about 90 per cent, hydro at 75 per cent, onshore wind at 30 to 35 per cent and offshore wind 60 to 70 per cent. To provide a like-for-like comparison we need to add storage—battery or hydro storage—to wind generation. How much storage is required? Referring to AEMO charts—I have attached a couple—for the months of April, May, June and July, looking at that I think we would have had about 20 to 30 per cent, if not up to 40 per cent, power blackouts over that period if we were relying solely on wind.

Two hour storage of dispatchable power is quite meaningless. We need storage measured in days if not weeks rather than hours. Greenhouse gas emissions from batteries can vary. I quote:

There are today over 100 research articles that cover the environmental impacts from lithium-ion batteries dating back to as early as 1999. The focus in the research varies, as do the methods. Of this reason the results are also widely different with a climate impact ranging from 39 kg CO<sub>2</sub>e/kWh to 196 kg CO<sub>2</sub>e/kWh.

Now, you have to multiply that by 1000 to convert to tonnes per gigawatt hour. That is by the way in the manufacture of the batteries.

If an electric vehicle is using a 40 kWh battery its embedded emissions from manufacturing would then be equivalent to the CO<sub>2</sub> emissions caused by driving a diesel car with a fuel consumption of 5 litre per 100 km in between 11,800 km and 89,400 km before the electric car even has driven one meter.

I have given you my source there. So if we add the battery storage required, the lowest carbon emissions for a realistic power generation source is nuclear combined with hydro. Wind with battery storage: there are very high carbon emissions inherent in the manufacture of the batteries. Wind plus hydro is not an answer as the scale of hydro and wind required is just not feasible.

The costs: I have gone to the CSIRO draft 2019 table. As we see, nuclear is 16 000 but then if we see a projected cost: 7000 \$/Kw, allowing for development. Now if for wind we need to add storage, how much shall we add? I think it should be at least 16 hours for onshore wind. However, looking at the figures I gave you for AEMO, I think actually it needs to be days and weeks, not 16 hours. The battery costs need to be double that shown, so onshore wind with battery storage at 16 hours is \$11 000 per kilowatt and offshore wind with battery hours at 8 hours is about \$10 500 per kilowatt. Nuclear works out quite cheap.

The economic, environmental and social benefits of having a secure, reliable power generation regime cannot be overstated. Put simply in one sentence: industry can plan and plan ahead—rather than adjust day by day or in some extremes hour by hour—production schedules with confidence. This leads to increased productivity, improving conditions for employment, which will go hand in hand with social benefits. A prosperous economy and a prosperous population should be the aim of every nation.

On the environmental benefits, much has been said by opponents to nuclear power generation of the dangers of the waste. It has been very much unfairly maligned by emotive and senseless rhetoric. We should be looking at the opportunities, not the negatives. We should be looking at how we can benefit from the waste. What use can we make of it? It is after all a heat source. I did listen to Simon Brink's discussion earlier, and I think he has some ideas there.

We also need to look at the environmental impact of alternatives. Onshore wind power—what land area is required to accommodate the number of generators? I covered this in my earlier submission. It is huge and not at all feasible. What is the impact on the environment of the turbines? There are great at killing raptors. The noise impact on their neighbours—operators deny, deny, deny and have big pockets to pay legal fees. The only way to address the issues is through legal challenges, which cannot realistically be afforded by most communities. And I must say the Bald Hills decision from the Supreme Court that came out last week was very heartening.

Recycling — turbine blades are not recycled. There are proposals and plans but no plants. Lithium batteries—again there are proposals and plans but no plants. Nuclear waste appears to be a minor problem. I am sorry; I was probably carrying on there.

Opportunities for Victoria: ideal locations for siting a nuclear power centre—we may look at existing power stations or where infrastructure is in place at the location of recently abolished power stations. With a relatively small footprint, locations would be easily found. Further opportunities would be in research and development of nuclear waste recycling. Australia is an observer in the ITER project; perhaps a more active role may be found.

Having a nuclear industry, I must say, would encourage more research and more development, and we are very innovative. I believe we all agree that developing nuclear weapons must be prohibited; however, there must not be any barrier for development and research in support of the nuclear power industry and industries serving the nuclear fuel cycle and industries recycling nuclear waste. Thank you.

**The CHAIR:** Thank you for that, Mr Wissink. Now, let us go. Any questions? Who would like to go first? Mr Hayes? Mr Limbrick? Who is going to go first? Mr Limbrick.

**Mr LIMBRICK:** Thank you, Chair. Thank you, Mr Wissink, for your contribution and submission. I would be interested—what is your primary motivation for putting in a submission to this inquiry and appearing today?

**Mr WISSINK:** I am looking at the power generation. Previously we had the SEC planning ahead and ahead. And we had one power station. As they completed Yallourn, they were planning already Loy Yang A

and B. With the demise of the SEC, that has just fallen away. We now have no policy looking forward to how we are going to find and generate a reliable power source.

If I have look at the wind industry, that is in my opinion a lot of hype. It does not deliver. It is unreliable, and it is a waste of land space. I have no confidence in it. I think it is driven more by, what can I say—we had a wind proposal in our area two years ago. It first came up in 2008. It was approved at that stage, but the developer did not proceed. They started up again in 2018. In 2008 I was working full-time. I did not have time to look at the proposal. I just thought, ‘Wind farm, good farm’. I believed the hype. In 2018 I did have time. I was retired, so I could have a look at it. I looked at the proposals. They were nonsense; they were meaningless. Nothing was important. Anything that detracted from his proposal—‘Oh, that can’t be important. No, that’s not really relevant’. Tearing up his submissions was so easy. They were just nonsense.

I had a look at a few other wind farms and their proposals. They are identical. They are nonsense. They promise a lot, but they do not deliver. The noise issue is a real issue. The design of the turbines does create a low-frequency noise. The noise standard that they have is one, I can say, that has been ideally developed by the industry for the industry. One does not measure a noise operating at a low frequency with an average.

**Mr LIMBRICK:** You were also talking in your submission about the costs of various energy generation types and how you feel that they are not compared properly. I mean, the economics of this has been something that we have been talking a bit about. Now, whether the economics is a justification for prohibition in the first place is another issue, but would you mind elaborating a bit on why you think these comparisons are not very well handled?

**Mr WISSINK:** I think these proposals are not very well handled because basically you are comparing a stable, reliable source with one that is variable. In South Australia we have that big battery system. It is providing 2 hours of power. Actually 75 per cent of that is more for stabilising the wind farm’s output, and the other 30 per cent is time for a gas-fired generator to fire up. So should you not be adding the cost of the gas-fired generator to the cost of your wind farm power supply? You are not comparing apples with apples. If you have a wind farm and you still have to add a gas-fired generator, what is the purpose? Yes, the power from the wind farm is free when it is running—when it is available—but when it is not available you are going to a very expensive gas-fired generator.

**Mr LIMBRICK:** It is something that I have noticed as well, and one thing that many people have been talking about is ‘these evil fossil fuel companies and the good wind turbine companies’, but what a lot of people do not seem to realise is that they are often the same company. Gas seems like a very good complement to a lot of these technologies, doesn’t it?

**Mr WISSINK:** But gas is a very useful resource. My background is that I am a mechanical engineer. I have worked in the petrochem industry for quite a long while. Gas is a very useful source for fuel, for fertiliser, for plastics. Why would you want to burn it? Generating power is not an efficient use for gas.

**Mr LIMBRICK:** Yes. Thank you very much. I will let someone else ask some questions, Chair.

**Mr WISSINK:** Thank you.

**The CHAIR:** Thank you. Who is next? Dr Bach.

**Dr BACH:** Thanks very much, Chair, and thanks for being with us, Mr Wissink. I was really interested in what you had to say just now, but also in your written submission. Could I ask you to turn your mind to something that you reflected upon in your submission, and that is regarding waste and the disposal of waste?

**Mr WISSINK:** Yes.

**Dr BACH:** We have heard some significant information from other witnesses regarding the disposal of waste, and obviously that is a really important issue for us to consider. I was interested in your submission to read about the French case study. So I might ask you a double-barrelled question, if I may, Mr Wissink. Firstly, regarding the disposal of high-level waste across generations and what can be done to assure the community in that situation that that waste is safe, and in doing that, would you mind referring to the French situation, the French model, which I know from reading your submission closely recommends itself to you?

**Mr WISSINK:** Right. The French model is basically reprocessing. What I was, in my comments, raising there is that the commonwealth government had an inquiry into nuclear prohibition, and the dissension reports were basically saying they had a visit to the US and looked at the disposal of waste in the US. The US does not allow reprocessing, so the level of waste there is substantially higher. The French and most European countries allow reprocessing, so your actual level of waste is very, very much lower. You do have medium-level waste and you have high-level waste. The amount of high-level waste in France is very low. They store it in vats, or drums, which are stored underwater to lower the temperature, and it has to be stored for a period of some 80 years. It is then proposed that it be buried. Now, Finland does have a deep-level geologically-stable storage facility for high-level waste; it is fairly recent. This is where I am saying basically the handling of high-level waste or of nuclear waste is a wonderful opportunity for us to actually put our minds to it. How can we handle it? How can we best handle it? How can we safely handle it? We did develop at one stage the synroc process, which was basically locking up the waste within a glass, and that would provide a fairly safe storage mechanism for it.

I was interested in the talk that came earlier by Mr Brink and his proposal of being able to treat the high-level waste with—what was it, thorium? I am not too sure how he was proposing, but it did sound very interesting. There are opportunities there for development and for us to be able to—I am sure we will—move forward to find more acceptable solutions. At the moment, yes, there will be high-level waste that needs to be stored and it would need to be stored for quite some time and it would need to be stored in a place where it can be cooled before it can be stored in a deep-level geologically-stable area. But are there not other possibilities for it? I think we need to have a look. Is this a half-glass-full opportunity or a half-glass-empty? I like to see it as a half-glass-full opportunity and see what we can make from it.

**Dr BACH:** Thank you, Mr Wissink. Thank you, Chair.

**The CHAIR:** Thank you. Who do we have next, please raise your hand. Okay. Mr Hayes, have you got any questions?

**Mr HAYES:** Not from me at the moment. Thanks, Chair.

**The CHAIR:** Any further volunteers? Thank you. Mrs McArthur and then Ms Bath.

**Mrs McARTHUR:** Thank you, Chair. Thank you, Mr Wissink. Do you think it is feasible for governments to have prohibitions on various forms of energy or other things which prohibit even the discussion and the exploration of the possibilities of doing something differently?

**Mr WISSINK:** No, I do not think it is reasonable. Yes, we do need safeguards. We do need to keep an open mind on all things, and to prohibit any level of science or any research is to my mind silly. I cannot see any reason for it; it is more an emotive reaction without any basis. I keep on seeing comments like, 'The only reason any country wants to develop nuclear power is so it can develop nuclear bombs'. Is that reasonable? Is that realistic for Australia? I cannot see any reason for it.

**The CHAIR:** Thank you. Ms Bath.

**Ms BATH:** Thank you, Chair, and thank you, Mr Wissink. Always you can see, when someone has an interest and a passion, that they go to a great deal of investigative powers, and you have presented a lot of material today. I guess there is a conundrum, because if—and this is the hypothetical 'if'—the Victorian government was to lift the ban locally in the state of Victoria, there is still a federal government ban, there is still a commonwealth ban, and also I understand there is still a commonwealth investigation going on at the moment into nuclear energy. So what can we do? What could happen in the meantime? What activities could be undertaken?

**Mr WISSINK:** Yes, very interesting question. I am not a politician, so I cannot really answer that, and I am not a legal person. I think we should be lifting it basically to provide encouragement to the federal. It does need to be a bipartisan, non-political decision, and it needs the support of everybody. It is not going to be practical for the current government to lift the prohibition only for the incoming government to slap it down again. That is nonsensical. It needs wide support, and I must say I was very heartened by some of the union inputs. I think it is possible that it can get wide support. We do need to point out the advantages there are, and we do need to point out what are the consequences of not pushing it forward.

There is an inquiry into what is the path forward for Victoria to reach 100 per cent renewables by 2050. Well, there is no path there. It is not possible. We need to realise that, and I think most of the population probably would not realise and it would not be quite acceptable. What is the choice? Blackouts, power blackouts, unreliable power supply or a reliable power supply? Employment opportunities from a reliable power supply or employment opportunities from an unreliable power supply? We have, say, your meatworks putting things in the freezer—whoops, the power is gone, the freezer is gone. We have a production line we can run today—no, we cannot run anymore. I have worked in a factory, in a forge. If your heater is full of billets ready to be forged and the power goes, you are probably having a major maintenance problem getting those out of the heater.

We do need to have reliable power sources, and as we saw in South Australia, was it two years ago, and in Victoria—was it last year, 2019—in February, renewables were producing 2 per cent. You cannot have that.

**Ms BATH:** Mr Wissink, thank you. Can I ask another question, Chair? Is that okay?

**The CHAIR:** Definitely you can.

**Ms BATH:** Thank you. Mr Wissink, our first speaker was Dr Helen Caldicott, who is a paediatrician and has spent her life advocating against nuclear of any form, and certainly nuclear bombs, which I would hope is a universal, in Australia, position. I am going to pick up your comment that you said that you have an engineering degree and put to you that her concern is around radiation and the effects of radiation from nuclear power plants, the storing of nuclear waste and/or when the atom is broken that there is a half-life of many various elements that can cause concern and/or cancers, and I would like your position. This is a question without notice, but if you can provide some context from your understanding in terms of being a chemical engineer. And I am assuming you are going looking for something?

**Mr WISSINK:** Yes, yes, yes. I am not a doctor; I am an engineer. I have got a paper here, a study of cancer in France: 'Cancer incidence in adults living in the vicinity of nuclear power plants in France, based on data from the French Network of Cancer Registries'. I am not a doctor. It needs to be read by a medical person. But basically the abstract was no, there is not a bias of cancer there. For thyroid cancer it was actually lower—the incidence of thyroid cancer within those areas was lower than in others. I can forward the paper to you.

**Ms BATH:** Thank you. That is fine. It was a question without notice that was probably of too large a scope for a short answer. But, thank you, Mr Wissink, I appreciate your comments.

**Mr WISSINK:** Would you like a copy of that paper?

**The CHAIR:** If you are able to send it to the secretariat, that would be great.

**Mr WISSINK:** I can do that, and there is another one too that I also found. This is from the US Navy—a study of occupational radiation exposure from US naval nuclear plants and their support facilities. Basically, they do trace the exposure that personnel have. In the 1960s yes it was high. With increasing knowledge and so on, the exposure has reduced, very, very much so. Again, I am not a doctor; a medical person can probably look at that better. I am not saying anything against Dr Caldicott. She is a very much respected person.

**The CHAIR:** Excellent. Thank you very much. Any further questions from any members? Okay, I have got two hands up. Mr Hayes and then Ms Taylor.

**Mr HAYES:** Thanks, Chair. Thanks, Mr Wissink, for your submission and answers. I understand from what you were saying before that you are advocating reprocessing of nuclear waste as is done in France. But from previous evidence we have heard that the main use for reprocessed plutonium is nuclear weapons, and since Australia has not really got a nuclear arsenal or is not planning for one at the moment, what uses could we make of reprocessed material?

**Mr WISSINK:** The reprocessed nuclear waste can be used, in my understanding—I am not an expert on this—in power generation reactors. It does not necessarily need to be used in weapons. And really any suggestion that we should move to production of nuclear weapons in any case or any part of the nuclear weapons chain is definitely not something I would suggest or propose or in any way think a good idea.

**Mr HAYES:** But there are other uses we could put reprocessed plutonium to.

**Mr WISSINK:** There are other uses for reprocessed, yes.

**Mr HAYES:** I know France has got a rather large nuclear arsenal from what I understand.

**Mr WISSINK:** Yes. They are a nuclear power so therefore they do have it. We are not a nuclear power, and I do hope we never will be.

**The CHAIR:** Thank you both. Ms Taylor.

**Ms TAYLOR:** I was just wondering. France has had to dig deep, deep, deep caverns to store the toxic waste. You are happy for us to take it here. Where would you want it dumped? Where would you be comfortable with that?

**Mr WISSINK:** I have not said we would be happy to take it here. What I said was we have got geologically stable areas where we would be able to locate the waste that we generate. I think there was an area in South Australia that was identified. We would need to look for an area which is geologically stable.

**Ms TAYLOR:** Yes. What if that is on sacred Aboriginal land and it is a culturally sensitive site?

**Mr WISSINK:** We are not allowed to. I am not too sure what we are allowed to do on sacred Aboriginal sites, but my understanding is no, we are not allowed to build anything on sacred Aboriginal sites.

**Ms TAYLOR:** So therefore we might have to bring it into the cities then. Maybe we have to bury it near our homes somewhere.

**Mr WISSINK:** Fine, if it is deep enough, and if it is in a geologically stable area.

**Ms TAYLOR:** Right. And do you have any other suggestions, or is it just one site in South Australia that might possibly, maybe be possible?

**Mr WISSINK:** I have not gone into that in detail. There was that—was it the commonwealth government looking into a site for storing of nuclear waste—that identified the South Australian site. There could be areas in Western Australia, there could be areas in Victoria. Perhaps down a gold mine shaft or an old gold mine shaft.

**Ms TAYLOR:** Like Ballarat?

**Mr WISSINK:** Ballarat, Bendigo.

**Ms TAYLOR:** Bendigo. I wonder how people there would feel about that.

**Mr WISSINK:** Well, Melbourne?

**Ms TAYLOR:** Melbourne, why not?

**Mr WISSINK:** I quite support that; I do not live in Melbourne.

**Ms TAYLOR:** Okay, thanks very much.

**The CHAIR:** Thank you. Any further questions? If there are no further questions, Mr Wissink, thank you very much for your time and contribution. It is much appreciated by the committee and, as I said earlier, a copy of the transcript will be emailed to you. So if any corrections need to be made, please make those corrections and send them back, as the copy of the transcript will be published on our website. Thank you. On that note, we adjourn and resume at 2.00 pm. All broadcast and Hansard equipment must now be turned off.

**Witness withdrew.**