

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

Professor John Quiggin, VC Senior Research Fellow, School of Economics, University of Queensland.

The CHAIR: I declare open the Environment and Planning Committee public hearing for the Inquiry into Nuclear Prohibition. Please ensure that your mobile phones have been switched to silent and that background noise is minimised.

Welcome to members of the public who are watching via the live broadcast. I would like to acknowledge my colleagues participating in this hearing today: Ms Bath, Mr Meddick, Ms Terpstra, Mr Hayes—the Deputy Chair—Dr Bach, Mr Limbrick and Ms Taylor. I think that is who we have, and I acknowledge the apology from other members who could not make it here today. Professor Quiggin, thank you very much for making yourself available today. We are looking forward to your contribution.

All evidence taken at this hearing is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject to the provisions of the Legislative Council standing orders. Therefore the information you provide during the hearing is protected by law. However, any comments repeated outside 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 copy of the transcript following the hearing, and if any omissions, any changes or any mistakes were made, please notify us and then they can be corrected, as the transcript will ultimately be made public and posted on the committee's website.

We have received your submission, and we have read it—members of the committee have read your submission and the Secretariat. We will give you about 5 minutes or so for opening statements or any particular points you want to share with the committee from your submission or any other matters, and then after that we will go to questions from the committee members. Professor Quiggin, we are all ears, and thanks again for joining us.

Prof. QUIGGIN: Thank you. I thank the committee for inviting me. I would like to acknowledge that I am talking to you from the land of the Jagera people and acknowledge their elders past, present and emerging.

I have made a number of submissions to inquiries over the last five years on this topic, starting with the most comprehensive, the South Australian Nuclear Fuel Cycle Royal Commission in 2016, which concluded that under the current conditions and current policies there was no likelihood of an economically possible nuclear power generation industry being developed in Australia. The royal commission did look into waste disposal, but that is a separate topic. Subsequently over the last year or so there has been a string of inquiries looking at legislative prohibitions at the federal, New South Wales and Victorian levels, and I think from what I can see the advocates of removal of the prohibition have not really responded to the findings of the South Australian royal commission.

So my initial response, I guess, was to dismiss these inquiries as being essentially a waste of time, but I thought on reflection that it would be better to take the issue seriously and suggest that there is a potential path forward to decarbonisation of the economy which would at least potentially give a role to nuclear power generation—though by no means guarantee it—and that would require either a very substantial carbon price or a reasonably tight schedule for the complete elimination of carbon-based energy electricity generation through essentially brown coal, black coal and gas. In those circumstances, if concerns about the reliability of renewables turned out to be well founded, there might be a place for nuclear power in the latter part of the 2030s. That is about the earliest at which we could feasibly see the implementation of nuclear power in Australia.

So I put up what was described in the media as a 'grand bargain'—that it would be a good thing if advocates of nuclear power supported the removal of the legal prohibition along with either a registered central carbon price or a clear-cut commitment to phase out all existing power. I have to say I found no interest in the previous inquiries, and therefore rather than repeat the same proposal to this inquiry I have come to the conclusion that in fact the advocates of nuclear power either are not serious—that they are just making a point in order to play little games—or they do not understand the economics, which clearly show that there is no way that nuclear power can be competitive with existing fossil fuels in the absence of a carbon price. And I have got a good deal of material in my submission to the inquiry to support that. I point particularly to the experience of Hinkley

Point, the only case where we have a reasonably clear and transparent process through which a recent nuclear power station has been developed in a Western country, and that was looking at a carbon price and it was a carbon price of around about A\$80 a tonne.

So I think that evidence is clear cut. I think compared to last year or 2016 we are further away from a carbon price than ever, and I therefore recommend that the committee should simply accept that nuclear power is not going to happen in Australia and not bother removing the ban, which I think would be a negative piece of symbolism suggesting a possibility that does not actually exist. Thank you.

The CHAIR: Going through the submission and some of the comments you made, in your view what would be some of the main advantages and drawbacks of Victoria specifically and Australia more broadly if we were to lift the prohibition on nuclear energy generation? I am interested in your view, looking at the pluses and minuses.

Prof. QUIGGIN: I do not have any state-specific possibilities. I think in the context of a commitment to rapid decarbonisation it would provide a backstop in case the combination of renewable generation and various forms of storage proved incapable of delivering the last mile, as it were, of reliability for so-called concerns about base load demand and so forth. In the absence of that kind of commitment I think there will be no value at all. It would in fact be misleading and simply continue a debate which I think in the absence of this kind of commitment should be closed.

The CHAIR: So following from that, can you take me through where we are placed in relation to our capacity to deliver stable baseload power from firmed renewables, and how does that compare with nuclear? So if you are able to sort of take us through some of the background and some of the submissions that you have made to various inquiries on this issue.

Prof. QUIGGIN: Sure. Obviously, that is rapidly evolving. If we went back 10 or 15 years, when most of the current advocates of nuclear power were forming their position, this was indeed a major issue. If you asked me then, I would have said that the only solution really to decarbonisation would require retaining at least some gas in the system as a peaking fuel and that we might be able to get to 60, 70 or 80 per cent renewables—the rest would have to be left to gas. But the combination of drastic reductions in the cost of renewables and the emergence of battery storage as a feasible option mean, in my view, it is likely that we can deliver a firmed renewable system at lower cost than the nuclear power and that nuclear power would be a reserve option that we do not indeed need to call on.

The point in my grand bargain idea was to say that we do not actually need to resolve this question now and we do not need to determine whether in 2035 we will be able to deliver a completely renewable system. If we make a commitment to complete decarbonisation and say that should the renewables plus firm power then not pan out we could look at that point at nuclear, that would seem to be a serious solution. As I have said, none of the advocates of nuclear power, of whom there are a large number, seem to have any interest in that combination.

The CHAIR: Mr Hayes?

Mr HAYES: Thanks, Professor Quiggin. That was a very interesting submission. I just wanted to find out on what basis you recommend a \$25-a-tonne carbon price, increasing by 5 per cent annually until it is \$50 a tonne. It is a position that I am very interested in. Our party is very keen on supporting a price on carbon. Did you see that as being a tax or market-based? Do you have a preference for either? And how do you come to those figures? Is it only to encourage nuclear, or would it also encourage solar and hydrogen production?

Prof. QUIGGIN: It is a price which, in my view, will be sufficient to drive existing fossil fuels out of the market in combination with renewables. If we had a price at that level, we would fairly rapidly see the closure of coal-fired power stations and their replacement with renewables. It would then be sufficiently high that if the best possible scenario emerged for nuclear it might be an option. Also, I suppose, try to lowball it in some sense. Obviously this is, politically, a very contentious topic, and so my recommendation is for a price comparable to the one we had briefly five or six years ago; this is actually a higher price that is embodied in, for example, United States benefit-cost analyses, the approach of the EU and so forth. It is a price which, in my view, will be sufficient to drive a rapid transition of the electricity sector in Australia.

Mr HAYES: Thanks, Professor. Could I also ask: in your view, do you think if Australia really moved towards large-scale solar and production of hydrogen gas from such that that would be enough to support Australia's domestic needs at least?

Prof. QUIGGIN: I believe that is the case. Obviously, you will have heard from a number of witnesses suggesting that is not the case and that nuclear power is necessary. The point that I had made is that if we went with a carbon price and then said, 'Well, nuclear can get in if it wants to', we would not need to address that issue. But as I have said—and I have not, obviously, been privy to the evidence you have just heard—I have not found much evidence from advocates of nuclear power in the imposition either of a carbon price or of a determined phase-out of fossil fuels. My view is that the correct policy is indeed to go as hard as we can with renewables. I think that will prove to be feasible. If we do this in the way we were talking about, we might end up keeping some gas in the system longer than would be optimal.

Mr HAYES: Okay. Thank you very much.

The CHAIR: Thank you, Mr Hayes. Who have we got next? Raise your hand. Mr Meddick.

Mr MEDDICK: Thank you, Chair, and thank you, Professor. My questions are also based around what Mr Hayes has just raised about a carbon price. What I am interested in there is a few things. What you are saying, just for clarification, is that the lack of a current carbon price policy—a policy lever that automatically then, by nature, prices fossil fuels out of the market—is the single largest impediment to concurrent investment in and growth of renewables, including nuclear, right? That is the single largest impediment? So we are talking about a federal policy lever. Knowing that the current philosophy and past philosophy of the federal government has been that a carbon price is not even on the table, do you have hope that that might change?

And also, I am looking at the various prices that you have got there: the \$25 per tonne, increasing annually by 5 per cent. At what point does that offset, if you like, of pricing fossil fuels bring a better pricing structure in all aspects of renewables—so infrastructure, investment et cetera? At what point do they kick in, and at what point does nuclear kick in then as a viable option from an economic perspective?

Prof. QUIGGIN: Sure. First, the absence of a price: whether it is explicit, the way I have described it, or wrapped up in something like the clean energy target, there were a whole string of attempts to sugar-coat this in a way that would get past the denialist lobby and the federal government, all of which failed, unfortunately. The absence of a pricing mechanism is undoubtedly the biggest obstacle both to renewables and to any prospect for nuclear power. The point of my proposed increase is that if you have the price with a commitment to increase it over time, that future commitment would also lead to more rapid phase-out decisions for fossil fuel. That is, if you have a price of \$25 and leave it there, people might continue along. And if they say, 'Well, it is going to increase every year', then they look at the costs of keeping the station operating and say, 'Really, we are just going to wind down in an orderly fashion', rather than action against the tide. In my view, this price would be enough to make a very substantial swing to renewables.

The evidence is it would still leave nuclear marginal at best, probably uneconomic, but if you want to be absolutely sure that we could deliver it and keep the option open—should, for example, small modular reactors turn out to be a great deal cheaper than we expect—then the combination of a price and the removal of the ban would be a good idea. As I said though, that is essentially a political judgement. I am not a politician, and obviously my political proposal did not go very far. But I think the committee should take this as a package: in the absence of a bipartisan commitment to a carbon price, there is simply no value in removing the prohibition. It would be a wrongly symbolic step.

Mr MEDDICK: Thank you, Professor. And just as a follow-up there, I am thinking in terms of that pricing—is there a finite time frame that you can put your finger on, say at \$25 per tonne after 12 months, then renewables such as wind and solar would be a far better option then, and at three years hence, at \$50 a tonne, this kicks in as a more viable option? I am not sure you have done that extent of modelling.

Prof. QUIGGIN: Sure. I hate to say it, but the one we had in 2012 was at the correct time. We are in fact running to a point where on the current likelihood I think we will be forced into a disorderly compulsion-driven phase-out of fossil fuel rather than a rational, price-based policy. We have simply left it too long, let the objections of ideologues simply drive us away from it, so that when we are finally forced to address the issue, it may well be that it is too late, that we are too far into the situation for rational action to be taking place. We

have seen this I guess to some extent with the pandemic—that if we had taken the right steps, which people knew about, we would not have had to be as extreme.

Mr MEDDICK: Wonderful; thank you. Thanks so much for your answers. Thank you, Chair.

The CHAIR: Ms Bath or Mr Limbrick—who would like to go first? Ms Bath. Unmute yourself, Ms Bath.

Ms BATH: Thank you. Thank you for your submission. I am interested that you, funnily enough, raised NuScale as a small modular reactor, when we have just heard this morning from the proponents of that type of energy source, and I am interested in your economic analysis of that versus a larger scale nuclear reactor—so the pros and cons from your perspective.

Prof. QUIGGIN: Well, something Admiral Hyman Rickover, who was the founder of nuclear power in the US Navy, said is the cheapest nuclear reactor is a paper reactor—that is, NuScale of course is a design; it is not an operating reactor, so we do not know anything about the actual economics of it, only estimates. You are really trading off two things here: one is the standard economics of scale, which say a bigger boiler is always going to be cheaper than a smaller one, essentially just because the surface area of a sphere grows less rapidly than the volume. That is a very standard engineering principle, and that has driven for a very long time the idea that up to a very large point bigger is cheaper. That has not worked out with nuclear for all sorts of reasons but essentially the complexity of the engineering, one-of-a-kind operation, safety problems and so forth. So the NuScale idea is to assemble the stuff in a factory-type setting in small bits, pay the cost in terms of less engineering efficiency in return for greater manufacturing efficiency. Now, whether or not that will work out, we do not know, but of course the problem is it has to not only match the existing designs but be greatly cheaper than they are. The existing designs are not economically competitive, so you have to weigh up the pluses and minuses of the small modular approach and then have a judgement that the benefits are going to not only outweigh the costs but produce a massive reduction in costs.

Now, it could happen, and the people of Utah are taking the risk for us, so it is certainly an experiment worth pursuing if someone else does it. I think the idea of committing to a strategy based on the assumption that this could work out would be greatly mistaken. It might happen; it might not. Again, the reasoning underlying my failed grand strategy was to say, ‘Well, if we went full steam ahead with decarbonisation and left this possibility open, we would be able to take advantage of it if it panned out’.

The CHAIR: Can I go to Mr Limbrick?

Mr LIMBRICK: Thank you, Chair, and thank you, Professor Quiggin, for your submission and for coming today. Is Professor Quiggin still there?

Prof. QUIGGIN: Yes, I am.

Mr LIMBRICK: How is it going?

Prof. QUIGGIN: Good.

Mr LIMBRICK: I was fascinated by your grand bargain a while ago. I think we had a couple of interactions.

Prof. QUIGGIN: Yes.

Mr LIMBRICK: I am a nuclear advocate who is actually quite interested in and fascinated by your idea, so I might be the exception to the rule. One interesting thing with the carbon price that you suggest is—correct me if I am wrong—there are a bunch of other things that would need to happen as well with that. So would that imply that all other subsidies and special protections and taxes and things to control the market would be taken out and then this would substitute for all of that? Is that sort of how it would work, do you imagine?

Prof. QUIGGIN: Well, that is certainly the idea. What we have had is a series of things which in some sense imply a kind of price for carbon. You had the renewable energy target, which did while it was active. Even in a limited way with the government’s so-called ‘direct action’ there was a sort of price hidden in there—hidden so deeply that even Tony Abbott could pretend it was not a price, but it was hidden in there. So certainly one explicit price is the idea—that you would not need in this context a renewable energy target or a clean

energy target or any of these things, and in my view you would not have explicit discrimination between renewables and nuclear. Obviously there is a whole bunch of costs which new nuclear would have to face on its own merits, but there would not be essentialism based on the fact that one was notionally renewable and the other was not.

Mr LIMBRICK: Yes, so if I am imagining it right, if you had a policy reset and a magic wand, it would be, ‘Get rid of all of the existing systems, put in the carbon price, lift the prohibition on nuclear and let the market decide on the rest’, effectively?

Prof. QUIGGIN: That is the way economists would look at it. Of course, we have not had much success in shifting the debate at all. But yes, that is very much the kind of approach, modulo ducking the nuclear issue, that was what was in the Garnaut review, that has been in every recommendation made by economists. As a member of the Climate Change Authority what we pushed is to try and get rid of ad hoc types of intervention in favour of one coherent price mechanism. I fear, as I said to a previous question, we may well have passed the point where that is feasible. In the absence of a very sudden change of heart by the leaders of both our major parties at the national level, by the time we get to anything, I think we will be past the point where we can do things in any kind of neat way, but that is again a political judgement; we will have to wait and see.

Mr LIMBRICK: And do you see it as like a bit of a mess at the moment because we have all sorts of strange subsidies that are favouring particular technologies and all that sort of thing at the moment?

Prof. QUIGGIN: It is obvious, I think, that we have in a sense a push for decarbonisation. Against that we have a group of people I call culture warriors—people who have decided for political reasons they do not like the kinds of people who like wind power and they do not like the kinds of people who like solar PV, so they are going to attack those technologies, which is a very strange way of approaching things, but my Twitter feed is full of them. So there are a heap of people out there putting in, for example, absurd restrictions on where you can put a wind farm, coming up with essentially bogus claims about the need for energy reliability that we saw, I think, in the National Energy Guarantee, which has now disappeared. Essentially the string of policies we have had coming out of the federal government have all reflected this cross-cutting of essentially illogical and cultural views at the expense of anything that could be said to be a rational economic policy.

Mr LIMBRICK: Thank you.

The CHAIR: Thank you. Can I go now to Ms Taylor.

Ms TAYLOR: Thank you, Mr—Professor Quiggin, sorry—for your contribution.

Prof. QUIGGIN: ‘Mr’ is fine.

Ms TAYLOR: Sorry about that.

Prof. QUIGGIN: That is okay.

Ms TAYLOR: I was just wondering now, you said—and I do not want to put words in your mouth, so please correct me if I am on a wrong tangent—that even with a carbon price, nuclear at its best chance might have a marginal contribution to make. Why is that? Could you unpack that? Is it because renewables have become so much cheaper and storage is advancing?

Prof. QUIGGIN: So at a marginal cost level, if you just look at the average cost of electricity, it is clear that renewables are by far the cheapest new source. So there is no way, if we for the moment ignore timing issues and just suppose we have a free storage technology, then there would be no questions; we would generate solar and wind, store it and ship it out, and that would be massively cheaper than nuclear, probably even cheaper than existing coal. And it is obvious that we can put in a moderate amount of storage quite cheaply to the point where we could deliver, say, 90 per cent of our electricity that way, especially if we used pricing sensibly, encouraged people to put their solar panels on the west face of their house rather than the north face—all of the kinds of things that we have not managed to get right with pricing—but there is a chance that we would still have the case which I see regularly in my Twitter feed of, ‘What happens if, as in such-and-such a year, there were 15 days in a row when it was 100 per cent cloud cover and no wind? What would you do then?’. For complete decarbonisation you can imagine that having some baseload power in the grid might potentially be

valuable in that context, and that is in some sense the gap which nuclear is designed to fill. If you look at the reasoning underlying it, it is essentially, 'We have this coal-fired system. Nuclear is just like coal except without the carbon. Let's do a one-for-one replacement'. And I think that kind of thinking has been shown to be obsolete, but there is a chance there might still be some spot for it.

Ms TAYLOR: Factoring in where we are at now—and, sorry, I do not want to be repetitive on this point because I think you have actually explained it really, really well—the earliest that nuclear could be built in Australia just is not a possibility without a carbon price, is that what you are saying? So there is no way unless it had, say, mass subsidisation or—

Prof. QUIGGIN: Sure. Of course a carbon price is not an improper subsidy, but it amounts to a price advantage relative to existing fossil fuels. Even if we start right now—so even if we did have this policy—we would be looking at the late-2030s before nuclear came onstream.

In my submission to the royal commission I set out some of the kinds of steps we need. Obviously even if the Prime Minister was listening in and suddenly decided this was the right thing to do, you would need to draft legislation, put it through the federal Parliament, find sites, have environmental impact studies into those sites, select the designs, select contractors and have a 10-year construction process at a minimum. So we are really looking at the late-2030s even if this policy was introduced rapidly, given the fact that we are going to fall over at the first hurdle—that is, the carbon price. This is why I have given up on advocacy of the bargaining and simply recommended to the committee that we retain the prohibition and go ahead.

Mr HAYES: We hope the Prime Minister is listening, Professor.

Prof. QUIGGIN: I must say, for a brief period during the pandemic it seemed as if he was. We were 100 per cent in accord, and it seemed as if he was listening. But, yes, I think the best option we have now is to push ahead as best we can with renewables but with inefficient policies unfortunately—economists are used to that, I guess—and not bother with adjusting the prohibition.

Ms TAYLOR: Okay. Thank you.

The CHAIR: Dr Bach, have you got any questions?

Dr BACH: No questions from me, Chair. I would simply want to add my thanks to Professor Quiggin for his outstanding submission. Thank you, sir.

The CHAIR: Thank you. I have got Ms Terpstra. Your hand is up. You are next.

Ms TERPSTRA: Very quickly. Thank you, Professor Quiggin, for your contribution. Just as a follow-on from Nina's questioning there, maybe if you could just put it in a nutshell for me: is it correct to say that it would be more economically viable for us to focus our efforts on the development of storage for renewable sources of energy as opposed to looking at going down the path of the development of nuclear technologies? Is that a good economic comparison to make or not?

Prof. QUIGGIN: Yes. Well, certainly, battery storage to a significant extent is feasible right now. It might run into limits well into the future, but I think that is the policy we are going to need for the foreseeable future to firm up the grid, especially as we see increasing failures in the coal-fired power station part of the system. That combined of course with the continued rollout of renewables and, unfortunately, a disorderly closure of coal-fired power, is I think the best option available to us at this point.

Ms TERPSTRA: Thank you.

The CHAIR: Mrs McArthur.

Mrs McARTHUR: Thank you, Chair. You state, Professor, in your submission that nuclear would only be feasible in competition with coal and gas with a price on carbon, which you say is hopeless. How then do you explain the highly successful nuclear power industry that is in operation in France, the USA and China, none of which have a price on carbon?

Prof. QUIGGIN: Running it through, the French industry was set up in the 1970s, so obviously it is not relevant to current conditions. The French nuclear power station under construction at Flamanville is about 10 years overdue and is running at double its cost. Now, I have written extensively and explained what happened in France in the 1970s. It has a great deal to do, for example, with the fact that the French state then and the Prime Minister of the day could announce, 'We're going to have nuclear power in January of—I think—'1974'; have the first concrete being poured in December of that year without even going through legislation; have extensive capital subsidies from the French state; and a bunch of other factors. But these are really of historical interest because France does not have a current successful nuclear power industry in the sense of new power construction. In fact it is busy reducing its nuclear power.

Exactly the same point is true of the US. The US has essentially commissioned one nuclear power station in the last, I believe, 15 years. That was the Watts Bar station, which had been abandoned since 1987; it was 85 per cent per complete. They finally finished that off. There were also four nuclear power plants started in the context of the so-called nuclear renaissance, with two in Georgia and two in South Carolina. The South Carolina plants were abandoned when almost 80 per cent finished. They decided even after I think \$5 billion had been spent apiece on those plants that it was not worth finishing them. The other two in Georgia at Vogtle almost started in the same phase. The shareholders finally decided to push through, but the loss on those plants drove Westinghouse, the constructor, out of business, and almost brought down Toshiba, the Japanese owners. So I think it is fair to say absolutely clearly that there is not a successful nuclear industry in either France or the US in the sense of new construction and there has not been for at least 25 years.

Mrs McARTHUR: I was going to say, just on another aspect of that: what do you say to the communities who have to endure massive wind towers but also now, more importantly, the transmission lines criss-crossing their countryside and their localities? Have they just got to grin and bear it?

Prof. QUIGGIN: If we are talking about nuclear power, first I assume we are going to need very long transmission lines. I cannot imagine that a nuclear power station is going to be located in the suburbs of Melbourne. And of course I think you will find—

Mrs McARTHUR: It might be located in an existing coal-fired power area which is connected to the grid.

Prof. QUIGGIN: I am not an expert on the layout of things. I suspect you will find that the objections to having a nuclear power station located near you will be every bit as strong as objections to wind power. I am not an expert, but my understanding—and my anecdotal experience since I have family members in this situation—is that those objections seem to disappear for the people whose land the wind farm is actually located on, who receive compensation. They mostly seem to come from the people next door who missed out.

The CHAIR: How do we broaden the conversation around issues of social licence and community consent? That is a big issue and along a similar line to what Mrs McArthur was talking about with powerline transmissions and wind turbines. I think the common factor between these two examples is that you will still have powerline transmission unless you go underground—that is the other option. So what is your view on how we can obtain a social licence? Because that is, let us face it, the biggest issue. The economy will work itself out; it is the social licence where people say, 'Yes, we want to do it' or 'No, we don't care', primarily driven by safety concerns and welfare. Have you got any thoughts on that?

Prof. QUIGGIN: I think it is a big concern and one of the reasons why, if nuclear power were to happen, it would take a very long time. I suppose again I allude to the pandemic and say things that seemed impossible can become possible. If we had a universal commitment covering all the major political parties to decarbonise fast and rapidly—to, for example, end coal mining and decarbonise all aspects of our economy—and the price of bringing some sectors of the community on board was to say, 'We'll remove the prohibition on nuclear power', I can imagine even people who do not like nuclear power reluctantly going along with it. To remove the prohibition while attempting to do nothing else, although of course within the powers of Parliament, would just be a slap in the face to people who reasonably enough have grave concerns about this, and these concerns would be exacerbated.

The CHAIR: Okay, Mr Limbrick, I believe you have a question.

Mr LIMBRICK: Yes, thank you, Chair. A couple of issues I would like to ask you about, Professor Quiggin: firstly, do you have any concerns about nuclear energy other than economic? We have heard a lot

about safety and these sorts of concerns. Are these not really concerns, do you think, and it is just more around the economics, from your point of view? And secondly, one of the issues around the economics is that there are lots of estimates on what nuclear power might or might not cost but one of the problems is because it is prohibited no companies want to really go to the effort of putting together business cases in a place where it is prohibited. We cannot really get a good answer on whether it is economic or not until we lift the prohibition because no-one wants to put in the effort to do that. What is your response to that?

Prof. QUIGGIN: So on the safety issue obviously safety is a concern. I mean, it is part of the issue and it is part of the reason why the second generation of nuclear power, which seemed to be economically feasible at the time, essentially collapsed after Chernobyl and Three Mile Island—the technology was seen as unsafe. When they put in the safety features it became too expensive to compete. Having said that, even at a local level coal is more dangerous in my view than nuclear power. The pollution from coal is so terrible. It literally is estimated to kill several million people every year, mostly in developing countries. So I guess if we only had a choice between coal and nuclear, I would certainly be favouring nuclear on local safety grounds as well as environmental grounds.

On the second point I agree that you have to remove the prohibition, but you also have to have a carbon price. As I have demonstrated, there is no possibility that nuclear power can be economic here without a substantial carbon price so as you have said, no-one is going to bother developing a proposal for something which is bound to lose money. That is why I think giving a spurious signal that we are open to nuclear power by lifting the prohibition makes no sense at all if we are not willing to also make the pricing system such that it has any chance of being feasible.

Mr LIMBRICK: So in that case though, you are talking about how it would not be able to compete without subsidies. Why do we need subsidies for other technologies then? Are they not able to compete, or is this just an acceleration thing?

Prof. QUIGGIN: Sure, so to be clear, it is coal and fossil fuels that are being subsidised. They are being allowed to dump carbon dioxide into the atmosphere at zero cost and imposing costs on all of us. I assume—I was not in Melbourne but I was in Sydney—breathing in choking smoke from the bushfires caused by climate change reduced my life expectancy by a measurable amount and of course that of every other person in nearly every city in Australia. So the subsidy as it exists goes to fossil fuels. Even without subsidy, however, it has turned out that at the margin solar power and wind have, very fortunately for us, become competitive compared with coal even in the absence of subsidies, particularly from older and less efficient coal-fired power stations. The issue is that although it would be sufficient to gradually push end-of-life coal-fired power stations out of the market, as has been happening for some time, if we want to close down something like Kogan Creek in Queensland, which was commissioned in 2005, we are going to need more of an incentive to do that than simply the fact that at the margin solar power is cheaper.

Mr LIMBRICK: And this disorderly thing that you are talking about, is part of that driven by these subsidies? You know, we have seen in Victoria where there has been a subsidised solar plant but the transmission capacity cannot handle it and so they have these curtailment issues and this sort of thing. Is this what you mean by disorderly?

Prof. QUIGGIN: Well, I think there are all sorts of problems with the electricity. I think I would put it differently. I think the problem is that we have an electricity pricing system which was designed for coal and has characteristics that are designed on the assumption that a power station is something that is turned on, bids into the market—a power-only market—and so forth. It is located in many places—that is one of them—but primarily I think at the federal level. Primarily it is the failure of policy at the federal level to come up with anything coherent that is producing this disaster.

Mr LIMBRICK: Thank you, Professor Quiggin.

The CHAIR: Thank you. Anything further? Ms Taylor, have you got your hand up?

Ms TAYLOR: If we have got time—we have got time. I can ask one more question.

The CHAIR: Yes.

Ms TAYLOR: I think we might have touched on it, but I just want to double-check. Nuclear proponents had said they cannot produce a business case with the prohibition in place. Does that make sense to you? Obviously I asked that question. I did not say a multimillion-dollar, heavily detailed business case, just a one-pager.

Prof. QUIGGIN: I mean, I could produce a business case for a marijuana business, for example. I could produce the case. Obviously I would not put a lot of effort into it in the absence of some expectation that it would come to reality. You certainly could use a business case if you chose to. As I said, removing the prohibition would not change things one way or the other. It would still be uneconomic because of the access to the price.

As I said, should we do it without the other changes? It would simply be a symbolic gift to a group of newspaper columnists and people like that who have been banging on about this topic, primarily to bash people they do not like. It would not produce any progress at all towards nuclear power. It would just be a pointscore exercise for a certain group. To make a serious investment in a business case worthwhile we need a very substantial carbon cost. That is the core of my submission.

Ms TAYLOR: Gotcha. Okay. Thank you for that.

The CHAIR: On that note, I think that concludes the session. Professor Quiggin, thank you very much for your contribution today. We really appreciate you putting in your submission and your time and effort in presenting today. Thank you very much. As I indicated earlier, a copy of the transcript will be emailed to you. Should you require any changes or note any omissions, you can advise us, because it will be published online later on. Thank you, Professor, very much.

Prof. QUIGGIN: Thank you.

Witness withdrew.